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THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

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THE RELATIONSHIP OF AFFECT AND CREATIVITY

BY

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Abstract

The present study evaluated the relationship between affect and creativity. Positive and neutral conditions of the Velten mood induction were used to alter the mood of 68 undergraduates: 21 males and 47 females. The effects of this mood manipulation on creativity was assessed using the Remote Associates Test (RAT). Subjects also completed several affect, creativity, and intelligence questionnaires. Affect intensity was measured with the Affect Intensity Measure (AIM) and daily affect ratings. Frequency of affect was measured with daily affect ratings, and the Fordyce happiness scales. The creativity sub-scale of the Adult Personality Inventory (API) and the Otis I.Q. test were used to assess creativity and intelligence respectively.

Subjects in a positive mood scored higher on the RAT than those in a neutral mood. This result confirms that previously reported by Isen et al. (1985). However, subjects high in affect intensity had less creative associations than those low in affect intensity. It appears that the tendency to experience high intensity affect interferes with the ability to perform reasoning tests (such as the RAT). Indeed, scores on the RAT were significantly correlated with
those on the Otis I.Q. test, suggesting that the RAT provides a measure of some kind of cognitive ability. The trait measure of creativity (provided by the API) was not significantly correlated with the RAT, suggesting that these two tests relate to different aspects of creativity. Furthermore, while RAT scores did not correlate significantly with any measures of affect frequency, these measures were related to score on the API. This latter relationship supports the idea of the "tortured artist." In addition, the rated creativity of the subjects' academic majors was significantly correlated with RAT performance.

Taken together, these data support the idea that affect and creativity are related. However, the relationship is not obvious. There appears to be different kinds of creativity (as revealed by the RAT and API scores respectively), and these are differentially related to affect measures and mood induction procedures.
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Perhaps one of the longest held conceptions about the arts is that artists must plunge themselves into the depths of emotional turmoil in order to be creative. Indeed, the Greeks believed that the god Dionysius filled humans with madness in order to bring about a creative, but destructive edge. This idea lingers on today with the conception of the struggling artist, who must drown himself/herself in aesthetic pain in order to create.

Creative people themselves have held this idea about the role of inspirational emotion in their own works. William James, who was a sufferer of very profound spells of depression, noted that people afflicted with extreme temperaments are more apt to be very creative, due to their ardor and excitability. He wrote, "Their ideas possess them, they inflict them....upon their companions" (Jamison, in press).

Probably the most intensely emotional people are those who suffer from bipolar affective disorder. People who are afflicted with bipolar disorder have emotional swings which go from debilitating depression to incomprehensible mania. Kraepelin, was one of the
earliest authorities on the then called manic-depressive illness (Jamison, in press).
Kraepelin noted the horrible outcomes for those afflicted with the disorder, who were left untreated. Kraepelin also noted a positive side of the illness, however. He thought that artistic activity could be furthered by the excitement of the disease, which could set free powers that are normally inhibited.

The current clinical diagnostic manual, the Diagnostic and Statistical Manual of Mental Disorders (DSM III: American Psychiatric Press, 1980) elaborates upon Kraepelin's idea in its list of symptoms describing one end of the bipolar disorder—hypomania. The DSM III criteria for hypomania describe a person who has an elevated and expansive mood. The afflicted person has a very high energy level, and is also restless. One afflicted would have a decreased need for sleep and would also be much more talkative than usual. In line with Kraepelin's idea of heightened arousal leading to a furthered creative output are the cognitive criterion of sharpened and unusually creative thinking. Although DSM III does not describe a causative direction between this heightened arousal and
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a creative thinking process, both elements are there.

Other cognitive criteria for hypomania are an inflated self-esteem and over-optimism or an exaggeration of past achievement. In the behavioral category, such symptoms as increased productivity, inappropriate laughing, joking, punning, uninhibited people seeking, hypersexuality, and excessive involvements in pleasurable activities with a lack of concern for any painful consequences are found (DSM III, 1980).

It is interesting to note that many of these criteria for hypomania are also characteristics of creative people as found in various studies reviewed by Stein (1962). Table 1 summarizes the symptomatic and characteristic parallels between hypomania and Stein's (1962) findings.

---------------------------------------------

Insert Table 1 about here

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Another parallel between hypomania and creativity is evident in studies by Karlins (1972) and Smith and White (1965). These authors argue that the capacity to pun and joke is a characteristic of the creative
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personality. Note also that punning and joking are characteristics of hypomania according to DSM III.

All of the above characteristics were found in 2 or more studies dealing with different types of people in various artistic and technical professions. This means that these characteristics of the creative personality are not specific to any one type of creativity.

Several studies attempt to demonstrate a link between the intense emotions of mood disorders and creativity in distinguished artists. Andreasen and Canter (1974) noted several problems with previous research which had concluded that schizophrenia was the psychological disorder associated with creativity. These problems included weaknesses with older versions of DSM, such as use of ill-defined diagnostic criteria and a reliance upon anecdotal information. Andreasen and Canter improved upon these earlier studies by using structured interviews, systematic diagnostic criteria, and matched control groups.

Their study was held at the University of Iowa writers' workshop, which is one of the most prestigious creative writing workshops in the nation. The staff
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has included such writers as Robert Lowell, Vance Bourjaily, Paul Engel, and Kurt Vonnegut.

Two groups were compared and matched for age, education, and sex; a group of writers and poets, and a control group of manifestly non-creative people with jobs outside of the creative arts. The subjects were interviewed about their psychiatric history and that of their families. Using the pre-determined diagnostic criteria, it was found that 21% of the writers' immediate relatives had some psychiatric disorder, compared to only 4.4% of the relatives of the non-creative group. The most common diagnoses among the relatives were affective disorder and alcoholism. A morbidity risk for depression among the primary relatives for both groups was calculated. The writers' relatives showed a 19% risk as compared to only 2% for the relatives of the control group.

The primary relatives were also classified in terms of their creativity, according to 3 categories: non-creative, creative, and highly creative. There was a small but significant difference between the primary relatives in terms of high creativity. At the mere creative level, a larger and still significant
difference was found, with 17% of the writers' relatives compared to only 4% of the control group's relatives meeting the criteria. Overall, 23% of the writers' relatives were rated as either creative or highly creative, as compared to only 7% of the control group's relatives.

In comparing the writers themselves to the control group, it was found that a total of 73% of the writers compared to only 20% of the control group suffered from some psychiatric disorder. Affective disorders specifically afflicted 67% of the writers, compared to only 13% of the control group.

Andreasen and Canter concluded that there is a connection between creativity and psychiatric disorder, specifically affective disorders, since the majority of the creative group was so afflicted. They also proposed a familial connection due to the high co-occurrence of creativity and affective disorder in the primary relatives of the writers.

The findings of the previous study (Andreasen and Canter, 1974) may be limited, since the subjects were exclusively writers. This problem of generalizability was addressed by Jamison (in press), who studied 47
writers and visual artists of recognized talent in Britain. Jamison found that a substantial proportion of the artistic sample suffered from affective problems. After being interviewed using the diagnostic criteria of Andreasen and Canter (1974), it was found that 38% of the sample had been treated for affective illness, with 75% of this group actually being hospitalized or given drug therapy. Importantly, for all three groups (writers, poets, and visual artists) the incidence of affective illness was significantly higher than the national average of only 1% for bipolar and 5% for unipolar disorders in Britain.

The subjects also reported several of the symptoms associated with bipolar affective disorder. Fully 33% of the group reported histories of severe mood swings, with 25% reporting extended elated mood states pointing to a manic type episode.

All of those sampled, with the exception of 22% of the playwrights, reported periods of an intense "creative fire." While experiencing the creative periods, 30% of the group reported at least 1 of the symptoms associated with bipolar mood disorder. The periods were marked with increases in energy,
enthusiasm, self-confidence, speed of mental associations, fluency of thought, and a sense of well being.

The evidence provided so far shows a connection between creativity and affect intensity of pathological proportions in groups of highly creative individuals. However, a recent experiment by Isen, Johnson, Mertz, and Robinson (1985), shows a link between creativity and an induced state of positive affect in an undifferentiated population of college students.

The Isen et al. (1985) experiment was based on the hypothesis that positive material is more extensive than other material in memory. Based on other work, they hypothesized that positive affect cues positive material in memory. Therefore Isen et al. projected that a positive affective state would cue more diverse and unusual associations than a neutral state.

Isen et al. manipulated their subjects' affective state with inducements which had been successfully used before in other experiments. After being presented with the positive or neutral manipulations, subjects were given word association tests to assess creativity. The tests were divided into 3 groups, positive,
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neutral, and negative words; each test contained only one type.

The associations given were then judged according to unusualness by comparing the responses to a previously devised word norm scale and by averaging the amount of times different words were given in comparison to the rest of the sample.

The results showed that the positive induced states with positive word association task and the positive induced states with neutral word task conditions resulted in significantly more unusual and diverse responses in comparison to the other conditions. The positive word associations also resulted in significantly more unusual responses in the neutral induced group. The negative words did not produce significantly more unusual responses across all conditions.

Isen et al. interpreted these findings to mean that a state of induced positive affect will tend to influence people to give more unusual responses to positive and neutral words. Positive affective states cue a more extended associational structure, thus bringing about more unusual responses. The authors
argued that positive affect influences cognitive and contextual organization. This general interpretation is in line with the previous discussion of sufferers of bipolar affective disorder, namely that emotional intensity influences the cognitive organization, rapid and diverse mental associations possible (Jamison, in press).

Based upon the studies showing a high occurrence of affective disorders in writers and visual artists (Andreasen and Canter, 1974; Jamison, in press), and the Isen et al. (1985) study showing that a manipulated state of positive affect provokes a heightened level of creativity, it is hypothesized that there is a connection between the daily experience of high affective intensity and creativity. The present research examines this connection in more detail.

To this end, the daily experience of affect intensity was measured using the Affect Intensity Measure (AIM; Larsen, 1984). The AIM has shown good reliability and construct validity in assessing the affect intensity trait (Larsen, 1984; Larsen and Diener, in press). Affect intensity is a stable trait that characterizes the typical strength with which an
individual tends to experience both positive and negative emotion (Larsen and Diener, 1985). The intensity with which an individual experiences emotion is thought to generalize across emotions (Diener, Larsen, and Emmons, 1984), content or hedonic tone of emotion (Diener, Larsen, Levine, and Emmons, 1985), and life events (Larsen and Diener, in press). Affect intensity is also a stable characteristic across the lifespan (Diener, Sandvik, and Larsen, 1985). Diener et al. (1980) report a gender difference, with females experiencing a higher intensity than males.

Creativity was assessed by the shortened form of the Remote Associates Test (Katz, in press). The RAT has been used effectively in prior research, and has shown good validity and reliability estimates (Mednick, M. T., 1962; Domino, 1970; Katz, in press). The shortened version of 15 instead of the usual 30 items used in this research is the same one used by Katz (in press), and has shown good validity compared to the standard form. The shortened version takes only 20 rather than 40 min. to complete.

To summarize, there are three basic questions to be asked in this research:
1. Is there a connection between the daily experience of high affect intensity and creativity?

2. What are the interacting effects, if any, of a mood manipulation upon creativity when affect intensity is considered?

3. Do people who are rated high in affect intensity choose more creative fields of study?

Method

Subjects

There were 68 subjects in this experiment, 21 male and 46 female, ranging in ages from 18 to 30. The mean age was 20.5, with a median age of 20.3. The standard deviation was 1.82. An additional 10 subjects completed questionnaires, but did not participate in the mood manipulation. Subjects fulfilled a course requirement as part of their enrollment in an introductory psychology course at a Midwestern University.

Materials
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Affect intensity was assessed using the AIM (Larsen, 1984), daily intensity ratings (Diener, Larsen, and Emmons, 1984), the Fordyce Happiness Scales (Larsen, Diener, and Emmons, 1985), and the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, and Griffin, 1985). Creativity was measured with the shortened form of the RAT of Katz (in press), and the creativity subscale of the Adult Personality Inventory (API; Krug, 1985). Intelligence was assessed using the Otis Intelligence Scale (Otis, 1939). Manipulations included positive and neutral conditions of the Velten Mood Manipulation Cards (Velten, 1968). Positive and neutral manipulations only were used, based upon the findings by Isen et al. (1985) that negative manipulations caused no significant effects on manifest creativity in a similar experiment.

Procedure

The experiment was carried out during a regularly scheduled class period. The AIM, SWLS, Fordyce Scales, and daily affect intensity ratings were all administered prior to the session, or were in the process of being completed outside of class. Subjects were randomly divided, with the subjects in the two
manipulation conditions being assigned to different rooms. Subjects in the positive manipulation were greeted by an affable and familiar experimenter. Subjects in the neutral manipulation were met by a "blank" stranger. To assess the effects of mood upon verbal processing, subjects were shown a slide presentation of Velten cards interspersed with RAT items, as shown in Table 2.

***************

Insert Table 2 about here

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Since Velten cards are designed to give an ever increasing amount of affect manipulation, the design of this experiment was set to achieve a peak mood at the end of the experiment.

After the slide presentation was completed, manipulation checks (an adjective checklist relating to mood—see appendix) were handed out and completed. Subjects returned the checklists and RAT answer forms, and were debriefed.

Results

To check for the effectiveness of the mood manipulation, scores were computed on the basis of the
adjective checklist by calculating the average affect balance per subject. The intensity ratings for the positive or negative adjectives were summed and then divided by the number of mood terms of each particular type to get the average positive or negative affect balance. The mean negative affect balance was subtracted from the mean positive affect balance to achieve the average overall affect balance. An analysis of variance on these balance scores revealed a significant difference between the conditions, with the positive group giving a higher mean affect balance than the subjects in the neutral condition ($F(1, 66) = 26.2$, $p < .001$).

To test whether affect intensity and the mood manipulation interacted to affect creativity, a two-way ANOVA, (with affect intensity and mood as the factors) was performed. Score on the RAT was the dependent variable. A median AIM score for males and females was calculated separately. Subjects scoring below the median for each gender group were combined into one group, and the higher scoring subjects were combined similarly. This was done because of the previous finding (as replicated here) of Diener et al. (1980),...
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that females score higher than males. Males' median AIM score was 13.9 (21), while females' median score was 15.4 (47). The AIM scores and the manipulation condition did not interact significantly, but there were main effects for each independent variable.

Insert Table 3 here

The AIM scores were responsible for over a full point difference in RAT scores between groups (low AIM x=6.7 (33), high AIM x=5.5 (35)), in a direction counter to the hypothesis, (F (1, 64)=3.7, p = .06). Subjects who scored low in affect intensity scored higher on the RAT than those who scored high in affect intensity. The effect of the mood manipulation on the RAT scores was significant. As in the Isen et al. (1985) study, subjects in the positive group scored significantly higher than those in the neutral condition (F (1, 64)=9.8, p < .01). Subjects in the positive condition had a mean RAT score of 7.2 (33), compared to a mean of only 5.1 (31) in the neutral condition. The interaction between affect intensity and the mood manipulation was not significant (F (1,
Daily intensity ratings served as the source for the measures of frequency of positive affect and negative affect (PA and NA, respectively), the intensity of positive and negative affect (PI and NI, respectively), and the of daily average intensity with which affect is experienced (INT). Using the daily form (see appendix) for 10 weeks, the subjects related their overall affect tone and intensity each day. Using a procedure outlined by Diener, Larsen, Levine, and Emmons (1985), daily positive and negative affect scores were calculated by summing the intensity scores for positive or negative adjectives, and dividing these scores by the number of words for each particular type. Average frequency of each type of affect was calculated by summing the days in which the specified type predominated, and then dividing by the number of days sampled. Positive intensity was calculated by taking the mean intensity of days in which positive affect outweighed negative affect. Negative intensity was similarly calculated by taking the mean intensity of days in which negative affect predominated. Daily intensity was averaged across these scores.
To examine the relationship between creativity and affect, scores on the RAT, the API creativity scale, and the Otis I.Q. test were correlated with the AIM, INT, PI, NI, PA, NA, the Fordyce happiness scale, the Fordyce percent happy scale, the Fordyce percent unhappy scale, and the SWLS. Correlations were computed for the group as a whole, and for each gender group separately.

In the overall analysis, the RAT correlated with the AIM \( r (68) = -0.16, p < 0.10 \). This correlation was accounted for by females. Females who scored higher on the AIM, scored lower on the RAT (\( r (47) = -0.21, p < 0.10 \)). The correlation between AIM and RAT scores for males was not significant. The correlation between the more rigorous measure of affect intensity, INT, and the RAT yielded an overall correlation \( r (68) = -0.23, p < 0.05 \). Furthermore, there were marginally significant negative correlations between the INT and RAT scores for both males and females (males: \( r (21) = -0.34, p < 0.10 \), females: \( r (47) = -0.21, p < 0.10 \)).

The API creativity scale did not significantly correlate with any of the affect measures except the frequency of affect measures: PA, NA, and the Fordyce
percent happy and unhappy scales. The correlation between PA and the API was generally in a negative direction, while a correlation between the API and NA yielded a positive correlation. In the overall sample, the API correlated with PA $r(75) = -0.22$, $p < 0.03$, and with the Fordyce percent happy scale $r(72) = -0.21$, $p < 0.04$. The API correlated with NA $r(75) = 0.23$, $p < 0.03$, and with the Fordyce percent unhappy scale $r(72) = 0.24$, $p < 0.02$. This general directionality of correlations was repeated when the analysis was broken down by gender, although the correlations were typically not significant.

The RAT and the Otis I.Q. test did not significantly correlate with any of the affect frequency measures, although they did generally have significant correlations with the scores of average experienced intensity of positive or negative affect. Overall, the RAT correlated $r(68) = -0.22$, $p < 0.04$ with average positive intensity, and $r(68) = -0.19$, $p < 0.07$ with average negative intensity. When the analysis was broken down by gender, there was a significant correlation ($r(21) = -0.40$, $p < 0.05$) for males between the scores RAT and NI. There was a negative but
insignificant correlation between the RAT and PI for males. Similarly females also had negative correlations between the RAT and PI scores, and the RAT and NI scores, however only the RAT x PI correlation reached significance ($r (47)=-.29$, $p < .03$). The Otis I.Q. test correlated $r (77)=.21$, $p < .04$ with NI, and positively but not significantly with PI. Males had a $r (21)=.52$, $p < .01$ correlation between the Otis and PI. For the female group, correlations between the Otis and NI, and between the Otis and PI were insignificant.

The inter-correlations of the measures of creativity were also examined to determine convergent validity. The RAT is a performance measure, specifically designed as a test of creativity (Madnick, 1962). The API creativity subscale is derived from a personality test, by weighting various trait scores and summing them (Krug, 1985). The Otis is a problem solving test designed to assess intelligence. The RAT and the Otis did not correlate significantly with the API creativity scale, although in overall analysis, the Otis and the RAT correlated together $r (68)=.26$, $p < .02$. For males, the correlation between the RAT and $r (47)=.36$, $p < .01$. 
To examine the correlation between affect intensity and the choice of academic major, subjects' majors were rated for creativity, and were correlated with the affect measures. A survey (see appendix) containing the 24 majors of the subjects was issued to and returned by 23 independent raters. The raters were instructed to rate the majors on a scale of 1 to 10, from "Not at all creative" to "Very creative". Raters were given the following definition to use as a guide in their judging:

Creativity is an act of putting ideas together, forming an original concept which meets some specified goal.

This definition is a modification of Mednick's (1962) definition, and was the ontological viewpoint of creativity used in this research. This definition is broad, but as Mednick points out, it is probably the only definition of creativity which could stand up in a court of law (Mednick, S. and Mednick, M., 1964).

Interrater reliability was calculated by averaging all of the correlations together. The average correlation among raters per major was x=.37. In spite of the low reliability, the analysis was completed as
Each subject was assigned an average score based upon their major, and these scores were then correlated with the affect intensity and creativity measures. Across the 3 conditions of analysis, creativity of major generally correlated negatively across affect measures, but only 1 correlation reached significance: PI and creativity of major in females, $r (46) = -0.25$, $p < .05$. Across the 3 conditions of analysis, the creativity of the major had varying and conflicting directions of correlation among the several creativity measures, with few reaching significance. Overall however, the creativity of the subjects' major was significantly correlated with the RAT $r (66) = 0.28$, $p = .01$. Females' creativity of major rating correlated $r (46) = 0.26$, $p < .04$ with the RAT, while in males the same correlation was in a similar direction, but not reaching significance. Overall, the creativity of major correlated negatively with the Otis, $r (67) = -0.41$, $p < .01$. In females, the majors' rated creativity
correlated $r(46)=-.43, p < .05$ with the Otis, and the correlation was similarly negative but not significant for males. The API creativity scale's correlations with the creativeness of the major was inconclusive and not significant, both overall and within each gender group.

Discussion

The Velten mood induction procedure appeared to have the expected effects on the subjects' moods. Those in the positive condition reported being in a more positive mood than those in the neutral condition. In addition, the present results replicate those obtained by Isen et al. (1985). The induction of a positive mood led to a significantly greater number of creative associations than did the induction of the neutral mood. This experiment utilized a different manipulation and a different creativity test than that of Isen et al. Therefore, it appears reasonable to conclude that creativity, as measured by word association tests, can be altered by a temporary and mild manipulation of affect.

Affect intensity did not modulate any of the effects of the mood manipulation upon creativity.
Rather than our predictions, affect intensity had a marginally significant main effect upon creativity in a negative direction. Those people high in their daily experience of affect intensity scored lower on the RAT. A similar conclusion could be reached on the basis of the correlational analysis. Overall, the RAT score correlated negatively with both the AIM score and the average daily intensity with which affect is experienced. These relationships were stronger in the female group. This latter finding can be accounted for by the observation that females experience affect at a higher level of intensity than do males.

Correlations between the API creativity scale and affect intensity measures did not reach significance, but these correlations were consistently in the negative direction. Thus, there appears to be a contradiction between findings. In one analysis, a change in mood produces a significant increase in creativity, and in another analysis, the daily experience of high affect intensity seems to be associated with a decrease in creativity. However, the construct of affect intensity is distinct from that of
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hedonic tone. The mood manipulation had a significant effect on hedonic tone, causing a momentary change in affect. Affect intensity, on the other hand, is a life-long personality trait dealing with the intensity with which all emotion is experienced. Perhaps as is shown here and in the Isen et al. study, a momentary externally mediated change in tone of mood in a positive direction elicits more associations, but general experiences of a high level of emotion may distract a person from being able to use their reasoning abilities efficiently. Such reasoning abilities appear to be assessed by the RAT.

An interesting finding, which lends support to the concept of the tortured artist, is that subjects who tended to have more unhappiness were found to be more creative according to the trait measure of creativity (API). The API was negatively correlated with the Fordyce percent happy scale and the frequency of positive affect scores. The API was also positively correlated with the Fordyce percent unhappy and frequency of negative affect scores. This seems to show that people who are unhappy more frequently have more creative personality traits. This finding seems
contradictory to the previously mentioned significant effect of positive mood on creativity as assessed by the RAT. This contradiction could be explained in terms of the difference between the two creativity measures. Additionally, the effects of a long term tendency to experience emotion of a particular hedonic tone upon creativity may be different from those of an externally manipulated, momentary change in mood. The explanation which seems more intuitively appealing derives from the difference in what the tests actually measure.

The API, the RAT, and the Otis I.Q. test had varying and conflicting correlations, thus convergent validity among the tests was not very high. Both the API and the RAT have been shown in different studies to identify manifestly creative people, but they have different perspectives of creativity. The RAT is based on an associationist view, while the API takes a personality trait orientation to creativity. The correlational analyses support the idea that the two measures reflect different perspectives. The API and the RAT did not significantly correlate under any of the conditions of analysis. However, the RAT did
significantly correlate with the Otis in the overall and female conditions of analysis. This seems to show that the RAT and the Otis scale are measuring at least some of the same components.

Since the various creativity measures (API and RAT) do not appear to be measuring the same thing, one must ask which measure actually measures the creativity construct. The answer to this question depends upon one's theoretical orientation to creativity. Successful attempts to validate both the API and the RAT have been made by correlating each with manifestly creative people in science, engineering and the arts (Mednick, 1967; Krug, 1985). However, studies attempting to validate the RAT have tended to concentrate on samples taken from scientific and technical fields, while scientists and writers were used as subjects in studies with the API. Thus, the validating procedures for the different measures have been different.

In order to try to understand the conflicting results described above, a different attempt was made to identify creative people from the sample by rating subjects' academic majors for creativity. The RAT was
the only measure of creativity which significantly correlated with this rating. Since only one definition was used as a guide for raters in their judgement, and it was a modification of the definition used by Mednick to create the RAT (Mednick, 1962), this finding should be regarded with some caution. In order to get a clear unbiased result, another definition more in line with the API's trait view of creativity should have also been used. Interestingly, the Otis I.Q. test was negatively correlated with the creativity of major. This would suggest that less intelligent people choose more creative majors. This is counter-intuitive, for it would seem that intelligence is necessary for creativity. Perhaps, as suggested above, creative people (defined as good "reasoners") need to function without the distraction of high intensity emotion.

Conclusions

Any future research in creativity will have to take account of the various ways in which the "creative person" can be identified. Without convergent validity among creativity measures, the validity of creativity as a personality construct will remain in question. Perhaps a more in-depth study could be carried out in
which manifestly creative people such as writers, visual artists, musicians, research scientists and the like could have their performances on a variety of tests compared. Certainly all people show some creativity at one time or another, but labeling the degree to which a product or action is creative is a subjective process; just how can creativity be defined in a standard way? Mednick's (1962) definition is broad and fully encompassing, but it leaves questions concerning specific kinds of creativity. Is the creative process of the painter of surrealistic fantasies the same as that of a production engineer?
I would like to thank Dr. Ed Diener for his help in guiding my hypothesis, interpretation of data and all of the other various things that he helped me with, without which I would never have learned as much as I did. I would also like to thank Dr. Albert Katz for his general helpfulness and the shortened form of the RAT. The services of Mark Stasson, over-worked TA, are also greatly appreciated. I would also like to sincerely thank Dr. Michael Coles, whose encouragement, interest, and editing have helped my project and my enthusiasm greatly. Finally, as a general all encompassing thank you, I would like to thank my parents and Jesus Christ for all of their support in the last 4 years.
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References


sex effects for affect intensity. Developmental Psychology, 21, 542-546.


### TABLE 1

**DSM III Criteria for Hypomania and Characteristics of Creative Individuals (Stein, 1962)**

<table>
<thead>
<tr>
<th>DSM III Criteria</th>
<th>Stein's review</th>
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<tbody>
<tr>
<td>elevated and expansive mood</td>
<td>emotional instability</td>
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<tr>
<td>high energy level</td>
<td>- openness to feelings and emotions</td>
</tr>
<tr>
<td>- restlessness</td>
<td>- vitality and enthusiasm</td>
</tr>
<tr>
<td>- decreased need for sleep</td>
<td>high energy output</td>
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<tr>
<td>increased talkativeness</td>
<td>- perseverence and persistence of motive</td>
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<tr>
<td>sharpened and unusually creative thinking</td>
<td>self-assertiveness</td>
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<td>inflated self esteem</td>
<td>dominance</td>
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<tr>
<td>- over optimism</td>
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<td>- exaggeration of past achievements</td>
<td></td>
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<td>increased productivity</td>
<td>high leadership qualities</td>
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</table>
### TABLE 2

**SCHEDULE OF PRESENTATION**

<table>
<thead>
<tr>
<th>SLIDE</th>
<th>TIME PER SLIDE</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>30 sec/slide</td>
<td>velten intros</td>
</tr>
<tr>
<td>11-20</td>
<td>15 sec/slide</td>
<td>velten manipulation cards</td>
</tr>
<tr>
<td>21-27</td>
<td>15 sec/slide</td>
<td>RAT instructions</td>
</tr>
<tr>
<td>28-31</td>
<td>75 sec/slide</td>
<td>1 RAT item</td>
</tr>
<tr>
<td></td>
<td>15 sec/slide</td>
<td>3 velten manipulations</td>
</tr>
<tr>
<td>32-35</td>
<td>75 sec/slide</td>
<td>1 RAT item</td>
</tr>
<tr>
<td></td>
<td>15 sec/slide</td>
<td>3 velten manipulations</td>
</tr>
<tr>
<td>52-56</td>
<td>75 sec/slide</td>
<td>1 RAT item</td>
</tr>
<tr>
<td></td>
<td>15 sec/slide</td>
<td>4 velten manipulations</td>
</tr>
<tr>
<td>57-61</td>
<td>75 sec/slide</td>
<td>1 RAT item</td>
</tr>
<tr>
<td></td>
<td>15 sec/slide</td>
<td>4 velten manipulations</td>
</tr>
<tr>
<td>87-91</td>
<td>75 sec/slide</td>
<td>1 RAT item</td>
</tr>
<tr>
<td></td>
<td>15 sec/slide</td>
<td>4 velten manipulations</td>
</tr>
<tr>
<td>92</td>
<td>75 sec/slide</td>
<td>1 RAT item</td>
</tr>
</tbody>
</table>
### Table 3
RAT scores by AIM and manipulation condition

<table>
<thead>
<tr>
<th>AIM</th>
<th>Manipulation condition</th>
<th>Positive</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low AIM</td>
<td>x=6.7</td>
<td>7.6</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>(33)</td>
<td>(16)</td>
<td>(17)</td>
</tr>
<tr>
<td>High AIM</td>
<td>x=5.5</td>
<td>6.6</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td>(35)</td>
<td>(19)</td>
<td>(16)</td>
</tr>
</tbody>
</table>
**Table 4**

Creativity ratings of academic major

<table>
<thead>
<tr>
<th>Major</th>
<th>Mean rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>5.0</td>
</tr>
<tr>
<td>Health and safety adm.</td>
<td>5.0</td>
</tr>
<tr>
<td>Chemistry</td>
<td>5.7</td>
</tr>
<tr>
<td>Dietetics</td>
<td>5.5</td>
</tr>
<tr>
<td>Economics</td>
<td>5.2</td>
</tr>
<tr>
<td>Education-gen</td>
<td>3.6</td>
</tr>
<tr>
<td>Biology</td>
<td>5.3</td>
</tr>
<tr>
<td>Marketing</td>
<td>8.3</td>
</tr>
<tr>
<td>Political science</td>
<td>5.4</td>
</tr>
<tr>
<td>Speech communication</td>
<td>7.5</td>
</tr>
<tr>
<td>Pre-med</td>
<td>4.4</td>
</tr>
<tr>
<td>Management info</td>
<td>5.5</td>
</tr>
<tr>
<td>Public relations</td>
<td>7.7</td>
</tr>
<tr>
<td>Electrical eng</td>
<td>6.0</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4.5</td>
</tr>
<tr>
<td>Urban planning</td>
<td>7.6</td>
</tr>
<tr>
<td>Liberal arts-gen</td>
<td>5.5</td>
</tr>
<tr>
<td>Finance</td>
<td>4.7</td>
</tr>
<tr>
<td>Accounting</td>
<td>4.0</td>
</tr>
<tr>
<td>Engineering-gen</td>
<td>5.4</td>
</tr>
<tr>
<td>Advertising</td>
<td>8.4</td>
</tr>
<tr>
<td>Elem. ed</td>
<td>7.3</td>
</tr>
<tr>
<td>Anthropology</td>
<td>5.0</td>
</tr>
<tr>
<td>Psychology</td>
<td>6.4</td>
</tr>
</tbody>
</table>

23 raters—mean corr=.37
Appendix A
Current Mood

Using the scale below, please indicate the intensity you are currently (at this moment) experiencing each of the following emotions:

0 = Not at all
1 = Slightly
2 = Somewhat
3 = Moderately
4 = Much
5 = Very much
6 = Extremely much

___ Nervous  ___ Happy  ___ Irritable  ___ Joyous
___ Sad  ___ Irritable  ___ Delighted  ___ Disappointed
___ Unhappy  ___ Sad  ___ Hostile  ___ Pleased
___ Glad  ___ Unhappy  ___ Cheerful  ___ Worried
___ Angry  ___ Glad  ___ Anxious  ___ Tense
___ Fearful  ___ Angry  ___ Pleased
___ Blue  ___ Fearful  ___ Worried
Appendix B
Word Problems

In this task you will be given word trios and will be asked to think of a word that is associated (goes with) all three. An example trio is:

cookies sixteen heart

and the answer is "sweet." Try to think of a word for this trio before you read on.

poke go molasses

The answer to that one is "slow." For each word, the answer you are looking for can go before or after the words given. Also, the word you are seeking may form a hyphenated word with a word given, or form a cliche or saying with a word given, or be a synonym (a word that means the same) of a word given. Two more examples of word trios are:

surprise line birthday
base snow dance

The answers to these are "party" and "bail" respectively.

On the following page are 15 word trios. Find the best word for each one and print it on the line beside the trio. Feel free to guess if necessary. You have 20 minutes.

Try and do the best that you can!
<table>
<thead>
<tr>
<th></th>
<th>mcuse</th>
<th>sharp</th>
<th>blue</th>
<th>cheese</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>snap</td>
<td>shoe</td>
<td>tissue</td>
<td>box</td>
</tr>
<tr>
<td>3</td>
<td>puss</td>
<td>spit</td>
<td>spoiled</td>
<td>sour</td>
</tr>
<tr>
<td>4</td>
<td>chamber</td>
<td>staff</td>
<td>box</td>
<td>music</td>
</tr>
<tr>
<td>5</td>
<td>sore</td>
<td>shoulder</td>
<td>sweat</td>
<td>cold</td>
</tr>
<tr>
<td>6</td>
<td>cherry</td>
<td>time</td>
<td>smell</td>
<td>blossom</td>
</tr>
<tr>
<td>7</td>
<td>jump</td>
<td>kill</td>
<td>bliss</td>
<td>joy</td>
</tr>
<tr>
<td>8</td>
<td>blood</td>
<td>music</td>
<td>cheese</td>
<td>blue</td>
</tr>
<tr>
<td>9</td>
<td>pot</td>
<td>butterflies</td>
<td>pump</td>
<td>stomach</td>
</tr>
<tr>
<td>10</td>
<td>note</td>
<td>dive</td>
<td>chair</td>
<td>high</td>
</tr>
<tr>
<td>11</td>
<td>bass</td>
<td>complex</td>
<td>sleep</td>
<td>deep</td>
</tr>
<tr>
<td>12</td>
<td>wicked</td>
<td>bustle</td>
<td>slicker</td>
<td>city</td>
</tr>
<tr>
<td>13</td>
<td>shopping</td>
<td>washer</td>
<td>picture</td>
<td>window</td>
</tr>
<tr>
<td>14</td>
<td>board</td>
<td>magic</td>
<td>death</td>
<td>black</td>
</tr>
<tr>
<td>15</td>
<td>widow</td>
<td>bite</td>
<td>monkey</td>
<td>spider</td>
</tr>
</tbody>
</table>
DIRECTIONS: The following questions refer to emotional reactions to typical life-events. Please indicate how YOU react to these events by placing a number from the following scale in the blank space preceding each item. Please base your answers on how YOU react, not on how you think others react or how you think a person should react.

1. ___ When I accomplish something difficult I feel delighted or elated.

2. ___ When I feel happy it is a strong type of exuberance.

3. ___ I enjoy being with other people very much.

4. ___ I feel pretty bad when I tell a lie.

5. ___ When I solve a small personal problem, I feel euphoric.

6. ___ My emotions tend to be more intense than those of most people.

7. ___ My happy moods are so strong that I feel like I'm 'in heaven'.

8. ___ I get overly enthusiastic.

9. ___ If I complete a task I thought was impossible, I am ecstatic.

10. ___ My heart races at the anticipation of some exciting event.

11. ___ Sad movies deeply touch me.

12. ___ When I'm happy it's a feeling of being untroubled and content rather than being zestful and aroused.

13. ___ When I talk in front of a group for the first time my voice gets shaky and my heart races.

14. ___ When something good happens, I am usually much more jubilant than others.

15. ___ My friends might say I'm emotional.

16. ___ The memories I like the most are of those times when I felt content and peaceful rather than zestful and enthusiastic.

17. ___ The sight of someone who is hurt badly affects me strongly.
18. ____ When I'm feeling well it's easy for me to go from being in a good mood to being really joyful.

19. ____ "Calm and cool" could easily describe me.

20. ____ When I'm happy I feel like I'm bursting with joy.

21. ____ Seeing a picture of some violent car accident in a newspaper makes me feel sick to my stomach.

22. ____ When I'm happy I feel very energetic.

23. ____ When I receive an award I become overjoyed.

24. ____ When I succeed at something, my reaction is calm contentment.

25. ____ When I do something wrong I have strong feelings of shame and guilt.

26. ____ I can remain calm even on the most trying days.

27. ____ When things are going good I feel 'on top of the world'.

28. ____ When I get angry it's easy for me to still be rational and not overreact.

29. ____ When I know I have done something very well, I feel relaxed and content rather than excited and elated.

30. ____ When I do feel anxiety it is normally very strong.

31. ____ My negative moods are mild in intensity.

32. ____ When I am excited over something I want to share my feelings with everyone.

33. ____ When I feel happiness, it is a quiet type of contentment.

34. ____ My friends would probably say I'm a tense or 'high-strung' person.

35. ____ When I'm happy I bubble over with energy.

36. ____ When I feel guilty, this emotion is quite strong.

37. ____ I would characterize my happy mood as closer to contentment than to joy.

38. ____ When someone compliments me, I get so happy I could 'burst'.

39. ____ When I am nervous I get shaky all over.

40. ____ When I am happy the feeling is more like contentment and inner calm than one of exhilaration and excitement.
Appendix D
FORDYCE EMOTIONS QUESTIONNAIRE

Part 1 Directions: Use the list below to answer the following question. In GENERAL, how happy or unhappy do you usually feel? Check the ONE statement below that best describes your average happiness.

10. Extremely happy (feeling ecstatic, joyous, fantastic!)
9. Very happy (feeling really good, elated!)
8. Pretty happy (spirits high, feeling good).
7. Mildly happy (feeling fairly good and somewhat cheerful).
6. Slightly happy (just a bit above normal).
5. Neutral (not particularly happy or unhappy).
4. Slightly unhappy (just a bit below neutral).
3. Mildly unhappy (just a little low).
2. Pretty unhappy (somewhat "blue", spirits down).
1. Very unhappy (depressed, spirits very low).
0. Extremely unhappy (utterly depressed, completely down).

Part 2 Directions: Consider your emotions a moment further. On the average, what percent of the time do you feel happy? What percent of the time do you feel unhappy? What percent of the time do you feel neutral (neither happy nor unhappy)? Write down your best estimates, as well as you can, in the spaces below. Make sure the three figures add-up to equal 100%.

ON THE AVERAGE:

The percent of time I feel happy ____%
The percent of time I feel unhappy ____%
The percent of time I feel neutral ____%
Total ____%
Appendix E
SATISFACTION WITH LIFE SCALE

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding. The 7-point scale is:

- 1 = strongly disagree
- 2 = disagree
- 3 = slightly disagree
- 4 = neither agree nor disagree
- 5 = slightly agree
- 6 = agree
- 7 = strongly agree

_____ In most ways my life is close to my ideal.
_____ The conditions of my life are excellent.
_____ I am satisfied with my life.
_____ So far I have gotten the important things I want in life.
_____ If I could live my life over, I would change almost nothing.
Daily Rating (Fall, 1985)

Pseudonym (1-3)  Date

Day Number (4-5)  Day of Week (6)
(where 1 = Sunday)

<table>
<thead>
<tr>
<th></th>
<th>Not at All</th>
<th>Very Slight</th>
<th>Some-What</th>
<th>Moderate Amount</th>
<th>Much</th>
<th>Very Much</th>
<th>Extremely Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

(7) ___ Happy  
(8) ___ Depressed/Blue  
(9) ___ Worried  
(10) ___ Unhappy  
(11) ___ Pleased  
(12) ___ Fearful  
(13) ___ Enjoyment/fun  
(14) ___ Sad  
(15) ___ Creative  
(16) ___ Joyful  
(17) ___ Angry  
(18) ___ Anxious  
(19) ___ Hostile  
(20) ___ Envious  
(21) ___ Romantic jealousy  
(22) ___ Embarrassed  
(23) ___ Shy  
(24) ___ Sociable

The thing that most positively influenced your mood today:

What time?

The thing that most negatively influenced your mood today:

What time?

What percent of your waking hours today were you:

% Happy  
% Unhappy  
% Neutral  
100%

Hours Today?  Activity level  What times?

Stranuous exercise (e.g. jogging)  
Moderate exercise (e.g. walking)  
Sitting or lying  

...
How much time today did you spend? (Round to nearest 1/4 hour):

____ Reading magazines and newspapers
____ Watching T.V.
____ Sleeping last night
____ Napping
____ Recreation alone
____ Worrying about tests or papers
____ Talking to a single other individual
____ At parties or the bars
____ Talking to a group of people (not at party or bar)
____ Worrying about personal relationships
____ Listening to stereo

Did you make your bed today? _____

How many aspirin, etc., did you take today? _____

How many people of the opposite sex did you talk to today (your age group, in person)? _____

How many classes were you late for today? _____

How many classes did you miss today? _____

Approximately how many different people did you talk to today? _____

Did you feel under the weather today? _____

How many snacks did you eat (besides regular meals)? _____

Did you cry today? _____ If so, how much? _____

Did you laugh out loud today? _____ (If so, how many times? _____

In conversations today, what % of the time were you talking? _____% 

How many strangers did you casually converse with today? _____
Appendix G
Read this page. Do what it tells you to do.

Do not open this booklet or turn it over, until you are told to do so.

Fill these blanks, giving your name, age, birthday, etc. Write plainly.

Name................................................Age last birthday.....years
First name, initial, and last name

Birthday.....................Teacher .................Date .............19.....
Month Day

Grade .............School......................... ... City.....................

This is a test to see how well you can think. It contains questions of different kinds. Here is a sample question already answered correctly. Notice how the question is answered:

Sample: Which one of the five things below is soft?
1 glass 2 stone 3 cotton 4 iron 5 ice

The right answer, of course, is cotton; so the word cotton is underlined. And the word cotton is No. 3; so a heavy cross has been put in the 3d circle. This is the way you are to answer the questions.

Try this sample question yourself. Do not write the answer; just draw a line under it and then put a heavy cross in the right circle.

Sample: A robin is a kind of —
1 plant 2 bird 3 worm 4 fish 5 flower

The answer is bird; so you should have drawn a line under the word bird and put a heavy cross in the 2d circle. Try this one:

Sample: Which one of the five numbers below is larger than 55?
1 58 2 48 3 29 4 57 5 16

The answer, of course, is 57, so you should have drawn a line under 57 and put a heavy cross in the 4th circle.

The test contains 80 questions. You are not expected to be able to answer all of them, but do the best you can. You will be allowed half an hour after the examiner tells you to begin. Try to get as many right as possible. Be careful not to go so fast that you make mistakes. Do not spend too much time on any one question. No questions about the test will be answered by the examiner after the test begins. Lay your pencil down.

Do not turn this booklet until you are told to begin.

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This test is copyrighted. The reproduction of any part of it by mimeograph, hectograph, or in any other way, whether the reproductions are sold or are furnished free for use, is a violation of the copyright law.
1. The opposite of defeat is —
   1. glory 2. honor 3. victory 4. success 5. hope

2. If 4 pencils cost 10 cents, how many pencils can be bought for 50 cents?
   1. 5 2. 10 3. 20 4. 40 5. 200

3. A bird does not always have —
   1. wings 2. eyes 3. feet 4. a nest 5. a bill

4. A hermit lives in —
   1. solitude 2. desertion 3. gratitude 4. compulsion 5. quiescence

5. Which of these words would come first in the dictionary?
   1. hip 2. lost 3. bold 4. love 5. heark

6. A lion most resembles a —
   1. 4. a dog 2. goat 3. cat 4. horse

7. Copper is cheaper than gold because it is —
   1. duller 2. more plentiful 3. harder 4. whiter 5. less useful

8. The first drawing is related to (the second in the same way that the third one is to one of the remaining four. Which one?

   This

   Is to this as this is to — 1. d 2. p 3. q 4. o

9. An electric light is related to a candle as a motorcycle is related to —
   1. a bicycle 2. flatulence 3. tire 4. speed 5. glow

10. The opposite of extravagant is —
    1. modest 2. humble 3. modest 4. poor 5. wasteful

11. A party consisted of a man and his wife, his three sons and their wives, and two children in each son's family. How many were there in the party?
    1. 17 2. 18 3. 19 4. 20 5. 21

12. One number is wrong in this series: 2, 3, 4, 5, 6, 7, 8, 9, 5, 9
    What should that number be?
    1. 7 2. 8 3. 9 4. 10 5. 5

13. A meal always involves —
    1. a table 2. dishes 3. hamburger 4. food 5. water

14. A lake always has —
    1. boat 2. fish 3. outlet 4. bottom 5. sand

15. What letter in the word WILMINGTON is the same number in the word (counting from the beginning) as it is in (its alphabet)?
    1. t 2. n 3. g 4. a 5. i 6. o

16. Which word makes the true sentence? A youth is (a) wiser than his father
    1. never 2. rarely 3. usually 4. always

17. Which one of these things is most unlike the other four?
    1. a broom 2. bend 3. chop 4. whistle 5. shear

18. The opposite of never is —
    1. often 2. sometimes 3. occasionally 4. always 5. frequently

19. Which O O is to this as this O O is to — 1. 2 3 4 5

20. At a wedding there is always —
    1. a minister 2. music 3. flowers 4. a bride 5. a cake

21. If 10 boxes full of apples weigh 300 pounds and each box when empty weighs 3 pounds, how many pounds do all the apples weigh?
    1. 30 2. 270 3. 297 4. 300 5. 308

(See right on to Page 2.)
23. If a boy can run 2 feet in 1/8 of a second, how many feet can he run in 10 seconds?
1 1 2 20 4 5 100

24. A clock is related to time as a thermometer is related to —
1 a watch 2 warm 3 a bulb 4 mercury 5 temperature

25. Becoming greater is a good definition for —
1 diminishing 2 changing 3 decreasing 4 vanishing 5 increasing

26. If the first two statements following are true, the third is (?).
All members of this committee are Democrats. Jones is not a Democrat. Jones is a member of this committee.
1 true 2 false 3 not certain

27. If the words below were arranged to make a good sentence, with what letter would the second word of the sentence begin?
Same means small little the as
1 s m d 4 t 5 a

28. Darkness is related to sunlight as (?) is related to sound.
1 noise 2 brightness 3 air 4 echo 5 quiet

29. A mother is always (?) than her daughter.
1 wiser 2 taller 3 stouter 4 older 5 more wrinkled

30. What people think about a person constitutes his —
1 personality 2 character 3 reputation 4 biography 5 career

31. A man always has —
1 children 2 nerves 3 teeth 4 home 5 wife

32. In general it is safest to judge a woman's character by her —
1 face 2 cooking 3 clothes 4 deeds 5 speeches

33. A circle is related to a square in the same way that a sphere is related to —
1 a circumference 2 a cube 3 round 4 corners 5 a ball

34. What is related to few as ordinary is related to exceptional?
1 none 2 some 3 many 4 less 5 more

35. Which of these pairs of words is not like the other four?
1 true — good 2 cry —- weep 3 lift — raise 4 lucky — hard
5 large — big

36. The opposite of peaceful is —
1 weak 2 ugly 3 slow 4 awkward 5 uncanny

37. The two words precise and indefinite mean —
1 the same 2 the opposite 3 neither same nor opposite

38. Of the five things below, four are alike in a certain way. Which is the one not like these four?
1 smuggle 2 steal 3 bribe 4 cheat 5 sell

39. To insist that stones have thoughts is —
1 absurd 2 misleading 3 improbable 4 unfair 5 ridiculous

40. The opposite of brave is —
1怯懦 2 weak 3 treacherous 4 cowardly 5 fragile

(See right on to No. 41 on Page 3.)
41. The sun is related to the earth as the earth is to — 1 clouds 2 rotation 3 the universe 4 the moon 5 circumference

42. The opposite of hope is — 1 faith 2 misery 3 sorrow 4 despair 5 hate

43. If the first two statements following are true, the third is (?) George is younger than Frank. James is younger than George. Frank is older than James.

1 true 2 false 3 not certain

44. If 34 yards of cloth cost 25 cents, what will 10 yards cost?

1 $1.75 2 35 c 3 80 c 4 $3.20 5 5 1 2 c

45. Subscribe means to write under, submarine means under the sea. Therefore sub means — 1 to write 2 under 3 the sea 4 to write about the sea 5 to see under

46. The mandates of a dictator are frequently — 1 obsolete 2 arbitrary 3 omnipotent 4 conditional 5 optional

47. What is related to disease as carefulness is to accident?

1 doctor 2 surgery 3 medicine 4 hospital 5 sanitation

48. If 34 yards of cloth cost 70 cents, what will 25 yards cost?

1 $2.75 2 30 c 3 67 1/3 c 4 69 c 5 5 3 2 c

49. Which number in this row appears a second time nearest the beginning? 4231 6 62 7 3 406432618679

1 6 2 2 3 3 4 4 5 5

50. If the first two statements following are true, the third is (?) Some members of this club are Baptists. Some members of this club are lawyers. Some members of this club are Baptist lawyers.

1 true 2 false 3 not certain

51. Which one of the five words below is most unlike the other four?

1 good 2 large 3 red 4 walk 5 thick

52. One who pretends to be what he is not is said to be — 1 sensitive 2 artless 3 vain 4 hypocritical 5 prejudiced

53. If the words below are arranged to make the best sentence, with what letter will the last word of the sentence end?

honesty traits Generosity character of desirable and are

1 y 2 a 3 r 4 e 5 c

54. If a strip of cloth 32 inches long will shrink to 30 inches when washed, how many inches long will a 48-inch strip be after shrinking?

1 46 2 48 3 47 4 47 1/2 5 46 1/2

55. Which of these expressions is not like the other three?

1 drink milk 2 look well 3 chop wood 4 spell words

56. If the words OHIO, NOON, ROTOR, and OTTO were seen on a wall by looking in a mirror on an opposite wall, how many of them would appear exactly the same as if seen directly?

1 1 2 2 3 3 4 4 5 5

57. Find the two letters in the word LA C1& bich iuvt just as many letters between the t in the word in the alphabet.

Which one of these two letters comes first in the alphabet?

1 l 2 A 3 T 4 E 5 R

58. A line is related to a surface as a point is to a —

1 circle 2 line 3 solid 4 dot 5 intersection

(Continued on to Page 4 under Page 3.)
48. One number is wrong in this series: 1 2 4 7 11 16 22 28
What should that number be? 1 5 2 6 3 10 4 20 5 18

49. This ★ is to this ▲ as this ● is to — 1 2 3 4

50. How many of the following words can be made from the letters in the word LARGEST, using any letter any number of times?
great, stagger, grasses, treatle, struggle, rattle, garage, strangle 1 2 3 4 5 6

51. Which of the following is a trait of character?
1 wealth 2 strength 3 reputation 4 loyalty 5 admiration

52. A statement based upon a supposition is said to be —
1 erroneous 2 ambiguous 3 distorted 4 hypothetical 5 dogmatic.

53. A legislature is to the state as a board of directors is to the —
1 nation 2 steckholders 3 partnership 4 general manager 5 corporation

54. Come is to going as (?) is to now.
1 today 2 presently 3 tomorrow 4 before now 5 hereafter

55. This ▲ is to this ● as this ★ is to — 1 2 3 4

56. One number is wrong in this series: 1 2 3 9 27 64 125 216
What should that number be? 1 5 2 6 3 10 4 20 5 18

57. If Frank can ride a bicycle 300 feet while George runs 300 feet, how many feet can Frank ride while George runs 300 feet?
1 600 2 450 3 300 4 450 5 225

58. What letter is the fourth letter to the left of the letter midway between F and T in QUALIFICATION?
1 C 2 L 3 O 4 I 5 A

59. Which of the five things following is most like these three: factory, bank, store?
1 monument 2 planning mill 3 school 4 church 5 museum

60. A hotel serves a mixture of 2 parts cream and 3 parts milk. How many pints of cream will it take to make 18 pints of the mixture?
1 1 2 3 4 5

61. Which of these pairs of words is not like the other four?
1 east and west 2 forward and backward 3 more and less 4 east and south 5 good and bad

62. If the words below were arranged to make the best sentence, the first word in the sentence would begin with what letter?
choose care man a friends should with his 1 e 2 b 3 m 4 s 5 i

63. What number is in the space which is in the rectangle and in the triangle but not in the circle? 1 2 3 4 5 6

64. What number is in the same geometrical figure or figures (and no others) as the number 5 in the figure of five figures? 1 2 3 4 5 6

65. How many spaces are there that are in any two geometrical figures, but only two?
1 1 2 3 4 5 6

66. If a wire 30 inches long is to be cut so that one piece is 5 inches longer than the other piece, how long must the shorter piece be? 1 34 2 14 3 9 4 12 5 6
Volten items

Instructions

Card 0.
Please read each of the following cards to yourself. Then whisper or mouth the words on the cards to yourself. Concentrate on each of the statements as they are placed before you, and make an effort to continue to do so until the next card is placed. Following these cards, there will be a brief series of simple tasks to perform, and following those, there will be a brief inquiry into your impressions of the experiment. OK?

Card 1.
Please read each of the following cards to yourself. Then whisper or mouth the words on the cards to yourself. Let's start with this card. But to avoid repetitiousness, begin with the statements below the line of dashes. After you have read what follows to yourself, whisper or mouth it.

I will read each of the following cards to myself. Then I will whisper or mouth the words on the cards to myself, and I won't worry about the reading errors which often occur in unfamiliar situations.

Card 2.
In the first part of this experiment, I will be shown a series of cards with statements typed on them. These statements represent a certain mood. My success will be largely a question of my willingness to be receptive and responsive to the idea in each statement, and to allow each idea to act upon me without interference. These ideas are called suggestions.

Card 3.
First, as each statement is placed before me, I will simply read it to myself, and then I will whisper or mouth it once in a manner appropriate to its intended seriousness. Then I'll go over each statement again and again in my head with the determination and willingness to really believe it.
Card 3. (cont.)

I will experience each idea. I will concentrate my full attention on it, and I will exclude other ideas which are unrelated to the mood -- like, "I'll see if this will work."

Card 4.

I will always attempt to respond to the feeling suggested by each item. I will then try to think of myself with as much clarity and realism as possible as definitely being and movin into that mood state. I am letting myself be receptive to these feelings. Different people move into moods in different ways. Whatever induces the mood in me the fastest and most deeply is the best way for me. Some people simply repeat the statements over and over again to themselves with the intention of experiencing them.

Card 5.

Some people find it natural and easy for them to visualize a scene in which they had or would have had such a feeling or thought. Or, perhaps some easy combination of repeating the statements and imagining scenes will come to me. Very likely, I will continue to concentrate my full consciousness on experiencing and retaining the mood with each suggestion. A certain amount of time will be devoted to each suggestion. I will continue to discipline and train myself in inducing a mood in myself by concentrating my full attention on the mood statements during any time interval.

Card 6.

To sum up: The purpose of this experiment is to see whether a person can talk himself into a mood. Some of these mood statements may have no relation to anything I have ever thought, said, or done. Yet, in exactly the manner of hypnosis, I will find it quite easy to accept and feel these emotions. I will be concentrating on doing so, rather than comparing each single statement to my life experience and then deciding whether it applies to me. I will let and strive to let them apply to me. I can do this.
Card 7.
I experience each statement as if it were especially written for me. At first I may feel the impulse to compare a single mood statement to my life experience, or to resist statements which seem to be or are contradictory to what I feel myself to be. But, most people feel this at first. It will become apparent to me that if I am able to talk myself into a mood, then obviously I know how to talk myself out of one. If I find that I can do these things, then I have learned something valuable about myself: I can learn to control my moods to an extent.

Card 8.
If I feel the urge to laugh, it will probably be because humor is a good way to counteract unwanted feelings or, it might be because I am surprised that I really am going into the mood. I will try to avoid these reactions, however, by keeping in mind that I have the chance of acquiring extremely useful information about myself and how to keep myself out of undesirable moods that occur in everyday life. If for any reason I feel that I cannot continue, I will so indicate.

Card 9.
The next card will begin the series of statements. I will read each to myself, then I will whisper or mouth it. Then I will try to experience the mood as well as I can and continue to do so until I hear a tone signifying that I am to turn to the next card. After the cards will be a brief series of simple tasks to perform. And after that, I will have the opportunity to record several aspects of my impressions of the experiment.
Positive manipulation cards

Card

1. Today is neither better nor worse than any other day.
2. I do feel pretty good today, though.
3. I feel light hearted.
4. This might turn out to have been one of my good days.
5. If your attitude is good, then things are good, and my attitude is good.
6. I've certainly got energy and self confidence to spare.
7. I feel cheerful and lively.
8. On the whole, I have very little difficulty in thinking clearly.
9. My parents are pretty proud of me most of the time.
10. I'm glad I'm in college—it's the key to success nowadays.
11. For the rest of the day, I bet things will go really well.
12. I'm pleased that most people are so friendly to me.
13. My judgment about most things is sound.
14. It's encouraging that as I get farther into my major, it's going to take less study to get good grades.
15. I'm full of energy and ambition—I feel like I could go a long time without sleep.
16. This is one of those days when I can grind out school work with practically no effort at all.
17. My judgment is keen and precise today. Just let someone try to put something over on me.
18. When I want to, I can make friends extremely easily.
19. If I set my mind to it, I can make things turn out fine.
20. I feel enthusiastic and confident now.
21. There should be opportunity for a lot of good times coming along.
22. My favorite song keeps going through my head.
23. Some of my friends are so lively and optimistic.
24. I feel talkative—I feel like talking to almost anybody.

25. I'm full of energy, and am really getting to like the things I'm doing on campus.

26. I'm able to do things accurately and efficiently.

27. I know good and well that I can achieve the goals I set.

28. Now that it occurs to me, most of the things that have depressed me wouldn't have if I'd just had the right attitude.

29. I have a sense of power and vigor.

30. I feel so vivacious and efficient today—sitting on top of the world.

31. It would really take something to stop me now!

32. In the long run, it's obvious that things have gotten better and better during my life.

33. I know that in the future I won't over-emphasize so-called "problems."

34. I'm optimistic that I can get along very well with most of the people I meet.

35. I'm too absorbed in things to have time for worry.

36. I'm feeling amazingly good today!

37. I am particularly inventive and resourceful in this mood.

38. I feel superb! I think I can work to the best of my ability!

39. Things look good. Things look—great!

40. I feel that many of my friendships will stick with me in the future.

41. I can find the good in almost anything.

42. I feel so happy and playful today. I feel like surprising someone by telling a silly joke.

43. I feel an exhilarating animation in all I do.

44. I feel highly perceptive and refreshed.

45. My memory is in rare form today.

46. In a buoyant mood like this one, I can do things fast and do them right the first time.
47. I can concentrate hard on anything I do.
48. My thinking is clear and rapid.
49. Life is so much fun; it seems to offer so many sources of fulfillment.
50. Things will be better and better today.
51. I can make decisions rapidly and correctly; and I can defend them against criticism easily.
52. I feel industrious as heck—I want something to do!
53. Life is firmly in my control.
54. I wish somebody would play some good loud music!
55. This is great—I really do feel good. I am elated about things.
56. I'm really feeling sharp now/
57. This is just one of those days when I'm ready to go!
58. I feel like bursting with laughter—wish somebody would tell a joke and give me an excuse!
59. I'm full of energy.
60. God, I feel great!

Neutral manipulation cards
1. Oklahoma city is the largest city in the world in area, with 631.166 square miles.
2. Japan was elected to the United Nations almost fourteen years after Pearl Harbor.
3. At the end appears a section entitled "bibliography notes."
4. We have two kinds of nouns denoting physical things: individual and mass nouns.
5. This book or any part thereof must not be reproduced in any form.
6. Agricultural products comprised seventy percent of the income.
7. Saturn is sometimes in conjunction, beyond the Sun from the Earth, and is not visible.
8. Some streets were still said to be listed under their old names.
9. The system is supervised by the Board of Regents.
10. There is a large rose-growing center near Tyler, Texas.

11. Many states supply milk for grammar school children.

12. It is God's will that the fittest survive.

13. The typography, paper, and bind were of the highest quality.

14. The machine dominated county posts for as long as anyone could remember.

15. The desk was old, and scratched into its surface was a profusion of dates, initials, and pleading messages.

16. The orient express travels between Paris and Istanbul.

17. When the Banyan bent down under its own weight, its branches began to take root.

18. There isn't a scientific explanation for every U.F.O. sighting.

19. The Hope Diamond was shipped from South Africa to London through the regular mail service.

20. The review is concerned with the first three volumes.

21. The ship was ancient, and would soon be retired from the fleet.

22. Slang is a constantly changing part of the language.

23. There is a small article in the local newspaper which indicates acceptance of the kidnapper's terms.

24. There are some forms in which no oath is required.

25. Intramatics finds mates for the lonely.

26. 99.1% of Alaska is owned by the federal government.

26. Two men dressed as repairmen will appear shortly after the van pulls up.

28. The wood was discolored as if it had been held in a fire.

29. A light was noticed in the dark outside, and it moved eerily towards the house.

30. Painting in a few other non-European countries is treated in a separate volume.

31. A recent study revealed that one half of all college students were unable to find summer jobs.

32. Provoked arousal and orientation are accompanied by steeper negative shifts.

33. The names on the Christmas mailing list are alphabetically
34. Significantly, these changes occur during the full moon.
35. West Samoa gained its independence in 1965.
36. The magazine's report was slanted, as usual.
37. The map would prove useless as a beginning guide.
38. The speaker outlined a plan whereby the current deficits could be eliminated.
39. Black and white pictures are arranged in ten sections.
40. The voices come only at night, and whisper words, terrible words.
41. The papers had been front-pageing it for days.
42. The notice made it clear that coffee breaks were being limited.
43. No man worked harder than he.
44. Potter wrote numerous satires on social cynicism.
45. Boeing's main plant in Seattle employs 35,000 people.
46. The doorkeeper was dressed in red.
47. During the next ten years, the group participated in politics.
48. The organization depended on the people for support.
49. In 1965, Elizabeth made the first state visit by a British monarch to Germany in 56 years.
50. It was their sixth consecutive best seller.
51. It all fitted in with the officer's story.
52. The merger did not change the company's policy.
53. The mansion was rented by the delegation.
54. Ninety occupations were listed as eligible for the graus in business.
55. Utah is the beehive state.
56. Changes were made in the transport of lumber after the border incident.
57. The Chinese language has many dialects, including Cantonese, Mandarin, and wu.

58. Things were booming once again in the little gold rush town of Angel.

59. At low tide the hulk of the old ship could be seen.

60. A free sample will be given to each person who enters the store.
CREATIVITY SURVEY

Please read and consider the following definition of creativity. After thinking about it for awhile, please rate the following majors for creativity utilizing the definition as a guide.

Creativity is an act of putting ideas together, forming an original concept which meets a specified goal.

Now, please rate the following majors in light of this definition, by rating each on a scale of 1 to 10. 1 is characterized as not at all creative, and 10 is characterized as being very creative.

<table>
<thead>
<tr>
<th>Major</th>
<th>Rating</th>
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<tbody>
<tr>
<td>1. BUSINESS-GENERAL</td>
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<td>2. HEALTH AND SAFETY ADMINISTRATION</td>
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<td>3. CHEMISTRY</td>
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<td>4. DIETETICS</td>
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<td>5. ECONOMICS</td>
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<td>6. EDUCATION-GENERAL</td>
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<td>7. BIOLOGY</td>
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<td>8. MARKETING</td>
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<td>9. POLITICAL SCIENCE</td>
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<td>10. SPEECH COMMUNICATION</td>
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<td>NOT AT ALL CREATIVE</td>
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<td>11. PRE-MED</td>
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<td>12. MANAGEMENT INFORMATION SYSTEMS</td>
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<td>13. PUBLIC RELATIONS</td>
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<td>14. ELECTRICAL ENGINEERING</td>
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<td>15. MATHEMATICS</td>
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<td>16. URBAN PLANNING</td>
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<td>17. LAS/GENERAL STUDIES</td>
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<td>18. FINANCE</td>
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<td>19. ACCOUNTING</td>
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<td>20. ENGINEERING-GENERAL</td>
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<td>21. ADVERTISING</td>
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<td>22. ELEMENTARY EDUCATION</td>
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<td>23. ANTHROPOLOGY</td>
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<td>24. PSYCHOLOGY</td>
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