Future Time Perspective and Self-Ratings of Creativity

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Abstract: Time perspective (TP) refers to a habitual way that individuals think of time. For instance, individuals with a future TP habitually think and prepare for the future. Future TP has been linked with creativity. This study examines future TP and self-ratings of creativity across five domains. Regression analyses found that future TP predicted self-ratings of scholarly creativity (R2 = .07), artistic creativity (R2 = .06), and self/everyday creativity (R2 = .10). Future TP, however, did not predict self-ratings of performance creativity, nor mechanical/scientific creativity. Further research should explore the influence of future TP in combination with other factors on creativity. Further research should also study the influence of future TP on actual creative contributions across domains of creativity. Several sex differences on ratings of past-negative TP and mechanical/scientific creativity are also discussed, as well as one ethnic difference on performance creativity.

Keywords: Future Time Perspective; Time Perspective; Self-Ratings of Domains of Creativity; Creativity; Sex Differences; Ethnic Differences.

THE INFLUENCE OF A FUTURE TIME PERSPECTIVE ON CREATIVITY

Psychological scientists have been studying creativity for many years. Simonton (2000) summarized years of research on creativity. Psychologists have identified many factors that are related to creativity, including: personality, intelligence, the availability of mentors, the social context, and sociocultural factors. One possible factor that has been studied in recent years is time perspective. Time perspective refers to an individual's habitual emphasis or focus on an aspect of time, such as the past, present or future (Zimbardo & Boyd, 1999). In other words, an individual may tend to be past, present, or future oriented. In addition, an individual may overemphasize her or his pleasant or unpleasant past experiences (Zimbardo & Boyd, 1999). This could lead to a habitual bias for an individual that influences what he or she will attend to, recall from memory, or what task he or she may focus on completing.

Research has examined the relationship between time perspective and creativity. A complicating factor, however, in these investigations revolves around definitions of time perspective and creativity. Regarding time perspective, some researchers have used induction techniques to encourage a future time perspective in their participants, whereas others have used measures of time perspective, such as the Temporal Orientation Scale (TOS; Holman & Silver, 1998) or the Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 1999). Regarding creativity, some researchers have had participants complete creative tasks, whereas others have used self-report measures of creativity.

INDUCING FUTURE TIME PERSPECTIVE

Forster, Friedman and Liberman (2004) in a series of studies induced a future time perspective by having participants imagine completing a task in the future (a year from now), as opposed to participants imagining completing the task tomorrow. Participants that had been induced into a future time perspective performed significantly better on a variety of insight tasks and abstract creative tasks. In a series of four studies Chen, Zhang and Qi (2020) induced participants into a distant temporal perspective by having them "imagine their lives 50 years from now" (p. 3) or induced participants into a proximal temporal distance perspective by having them "imagine their lives tomorrow" (p. 3). Participants induced into the distant temporal perspective performed better than those induced into a proximal temporal distance perspective on a variety of creativity tasks, including: a Verbal Divergent Thinking Task, the Chinese Remote Associations Test, the Toy Design Task, and an Ad Evaluation Task.

Meyer, Hershfield, Waytz, Mildner & Tamir (2019) in two studies measured creativity using divergent thinking tasks. An example divergent thinking task may ask a person to come up with as many possible uses for something (e.g., a pen) as they can think of in five minutes. In study 1, they found that more creative individuals experienced more vivid distal simulation tasks (temporal, spatial, social, and hypothetical). Among the distal simulation tasks was a distal temporal simulation task that required participants to think about the far future. Thus, distal simulation tasks in general may be somewhat akin to inducing a future time perspective. Distal tasks require an individual to imagine a task that is either distant in the future (temporal), distant in terms of physically far away (spatial), a distant person from you (social), or a distant hypothetical problem (such as "imagine the continents never divided" [p. 485]). In study 2, Meyer *et al*. (2019) identified creative experts that were writers, actors, directors, and visual artists. They found that these creative experts significantly outperformed controls (individuals in the legal, medical, and financial industries) on divergent thinking tests and experienced more vivid distal simulations.

MEASURING FUTURE TIME PERSPECTIVE

In two studies, Chiu (2012) induced time perspectives in participants and measured their future time perspective using the ZTPI. A future time perspective was induced by having them imagine and write down what the world would be like in 50-years, 5-years, or the present-day. In study one, participants in the 50-year induction condition performed better on the creative imagery task (CIT) (in terms of the originality and beyond reality of the responses) as compared to both the 5-year and present-day induced participants. In study two, Chiu used the future time perspective scale from the ZTPI to measure participants future time perspective and randomly assigned participants to either the 50-year, 5-year, or the present-day induction conditions. Participants in the 50-year induction condition who scored high on the future scale of the ZTPI performed better on the CIT. In addition, participants in the present-day induction condition who scored low on the future time scale of the ZTPI also performed better on the CIT. This suggests that a match between time perspective (TP) and an individual's induction condition may lead to better creativity rather than just a future TP leading to better creativity.

McKay and Gutworth (2021) studied time urgency (a concern over the passage of time; being hurried or patient), pacing style (how people allocate their effort over time), temporal focus (i.e., time perspective as measured by the TOS), polychronicity (tendency to multi-task or not), creativity and personality. Instead of measuring creativity with specific tasks, McKay and Gutworth used the Kaufman Domains of Creativity Scale (K-DOCS; Kaufman, 2012) and the Inventory of Creative Activities and Achievements (ICAA; Diedrich *et al*., 2018). The K-DOCS measures self-ratings for five domains of creativity, however, McKay and Gutworth (2021) focused on combining the five domains into an overall general self-perception of creativity score. McKay and Gutworth (2021) hypothesized that past, present and future time perspectives would all have positive relationships with creativity. Indeed, they found that past and present time perspective had significant correlations and regressions for both overall general self-perceptions of creativity and self-reported creative activities. In addition, future time perspective had significant correlations and regressions for only overall general self-perceptions of creativity, but not for self-reported creative activities. McKay and Gutworth also reported statistically significant ($p < .05$) correlations between self-ratings for each of the specific five domains of creativity (as measured by the K-DOCS) and the past, present and future time perspectives (measured by the TOS). These findings seem inconsistent with previous research, therefore more study is needed to examine the relationship between time perspective and creativity.

CURRENT STUDY

The current study will use a different measure of time-perspective. Whereas McKay and Gutworth (2021) used the Temporal Orientation Scale (TOS) developed by Holman and Silver (1998), this study will use the Zimbardo Time Perspective Inventory (ZTPI) developed by Zimbardo and Boyd (1999). The TOS is a 28-item scale that focuses on identifying only past, present, and future time perspectives. In addition, two questions were deleted by Homan and Silver in their analysis of the TOS, so it is unclear if those two questions should be permanently deleted from the TOS or not. Therefore, to avoid

deleting questions from a survey and to use a survey that identifies more than three time perspectives this study used the ZTPI. Zimbardo and Boyd (1999) developed a measure of time perspective that includes 56-items and identifies five time perspectives, including: past-negative, present-hedonistic, future, past-positive, and present-fatalistic. These five time perspectives identified by the ZTPI would seem to be more sensitive to identifying the subtleties that likely exist in time perspectives.

Like McKay and Gutworth (2021), the current study will use the K-DOCS as a measure of self-rated creativity, however, this study will focus of the specific five domains of creativity that are identified with that scale and not on an overall average of the five domains. This emphasis on the different domains (types) of creativity is consistent with the idea that there are different kinds of creativity and it is not a general ability (Kaufman, 2006). The five domains of creativity identified by the K-DOCS include: scholarly creativity, artistic creativity, self/everyday creativity, performance creativity, and mechanical/scientific creativity.

PREDICTION

It is predicted that future time perspective will significantly correlate with all domains of creativity and predict all five domains of creativity.

METHOD

PARTICIPANTS

Participants were undergraduate students at a public state university in the southeastern United States. Participants earned partial course credit in their Introduction to Psychology courses for participating in the study. There were 264 participants (169 females, 93 males, 2 transgenders) ranging in age from 18-49 with a mean of 19.4 years (SD = 2.98). There were 99 African Americans (37.5%), 72 Caucasians (27.3%), 41 Native Americans (15.5%), 19 Latin Americans (7.2%), 14 Multi-ethnic (5.3%), 10 Asian (3.8%), 5 other (1.9%), 3 Asian American (1.1%), and 1 Polynesian (0.4%).

PROCEDURE

Prior to beginning the study approval was obtained from the internal review board at the University of North Carolina at Pembroke. Participants were students currently enrolled in Introduction to Psychology undergraduate courses. Participants were recruited using an online psychology experiment sign up system (SONA). As participants signed up for the study online, they were prompted to complete the questionnaires online in the SONA system.

MEASURES

Participants completed a variety of questionnaires online. The questionnaires analyzed here include the K-DOCS, the ZTPI and a short demographics questionnaire.

TIME PERSPECTIVE

To measure time perspective the Zimbardo Time Perspective Inventory (ZTPI) was used (Zimbardo & Boyd, 1999). The ZTPI measures five time perspectives including: past-negative, present-hedonistic, future, past-positive, and present-fatalistic. Some example items for the past-negative time perspective include: I often think of what I should have done differently in my life, even though I am enjoying the present; I am drawn back to comparisons with similar past experiences; and I think about the bad things that have happened to me in the past. Some example items from the present-hedonistic time perspective include: I try to live my life as fully as possible, one day at a time; I often follow my heart more than my head; and I prefer friends who are spontaneous rather than predictable. Some example items from the future time perspective include: I believe that a person's day should be planned ahead each morning; Before making a decision, I weigh the costs against the benefits; and I keep working at difficult, uninteresting tasks if they will help me get ahead. Some example items from the past-positive time perspective include: Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories; It gives me great pleasure to think about my past; and I like family rituals and traditions that are regularly repeated. Some example items from the present-fatalistic time perspective include: Since whatever will be will be, it doesn't really matter what I do; It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway; and Often luck pays off better than hard work. The instructions directed participants to rate how much each item characterized themselves and the answer to each item was given on a Likert-type five-point scale (1 = very uncharacteristic, 2 = uncharacteristic, 3 = neutral, 4 = characteristic, 5

= very characteristic). The Cronbach's alphas for the five time perspectives in this study were: past-negative = .84, present-hedonistic = .81, future = .71, past-positive = .64, present-fatalistic = .72.

SELF-PERCEPTIONS OF CREATIVITY

To measure self-perceptions of creativity the K-DOCS was used (Kaufman, 2012). The K-DOCS measures self-ratings for five domains of creativity, including: scholarly, artistic, self/everyday, performance, and mechanical/scientific. Scholarly creativity encompasses debating, researching a topic, explaining, and arguing points of view. Some example items of scholarly creativity include: Researching a topic using many different types of sources that may not be readily apparent; Arguing a side in a debate that I do not personally agree with; and Coming up with a new way to think about an old debate. Artistic creativity involves visual art, such as drawing, painting, and photography, as well as sculpture. Some example items of artistic creativity include: Drawing a picture of something I've never actually seen (like an alien); Making a sculpture or a piece of pottery; and Enjoying an art museum. Self/everyday creativity is characterized by getting along with others, having a balance in life, and finding ways to have fun. Some example items of self/everyday creativity include: Finding something fun to do when I have no money; Understanding how to make myself happy; and Getting people to feel relaxed and at ease. Performance creativity encompasses "writing and music" (p. 303). Some example items of performance creativity include: Writing a poem; Composing an original song; and Acting in a play. Mechanical/scientific creativity is characterized by being good at math, computers, and at creating things out of wood, metal, or other material (Kaufman, 2012). Some example items of mechanical/scientific creativity include: Carving something out of wood; Taking apart machines and figuring out how they work; and Helping to carry out or design a scientific experiment. The instructions asked participants to rate themselves as compared to others their same age and with the same life experiences and answer each item on a Likert-type five-point scale (1 = much less creative, 2 = less creative, 3 = neither more nor less creative, 4 = more creative, 5 = much more creative). The Cronbach's alphas for the domains of creativity in this study were: scholarly = .87, artistic = .86, self/everyday = .84, performance = .88, mechanical/scientific = .89.

DEMOGRAPHICS QUESTIONNAIRE

A demographic questionnaire asked participants their ages, sex, ethnicity, undergraduate major, number of hours spent studying, number of friends, whether they attended religious services, and how many years of musical experience they had. Only information about participants' age, sex and ethnicity are reported here.

RESULTS

To minimize the likelihood of a type 1 error, the alpha level was set at $p < .01$ for all the statistical analyses conducted.

PRELIMINARY ANALYSES

Sex Differences

Possible sex differences were examined for scores on the ZTPI and K-DOCS. Two sex differences were found. First, females scored higher ($M = 3.27$) on the past-negative time perspective of the ZTPI than males ($M = 3.03$), $t(236.16) = -2.85$, $p < .01$, $d = 0.36$, 95% CI [-0.39, -0.07]. Second, males scored higher ($M = 3.00$) on the mechanical/scientific domain of creativity in the K-DOCS than females ($M = 2.64$), $t(242.06) = 3.05$, $p < .01$, $d = 0.40$, 95% CI [0.15, 0.59].

Ethnic Differences

Possible ethnic differences were examined for scores on the ZTPI and K-DOCS. A multivariate analysis of variance was conducted with ethnicity as the independent variable and the subscales of the ZTPI and K-DOCS as dependent variables. Only one ethnic difference was significant. It was found that the different ethnicity scores on the performance creativity domain of the K-DOCS were rated significantly different from each other, $F(8,264) = 2.74$, $p < .01$, $\eta 2p = .08$. Three post-hoc Bonferroni corrected t-tests (.05 divided by 3 = $p < .017$) compared African Americans, Native Americans, and Caucasians. African Americans ($M = 3.27$) scored significantly higher on performance creativity than Caucasians ($M = 2.79$), $t(169) = 3.60$, $p < .001$, $d = 0.57$, 95% CI [0.21, 0.74].

Correlational Analyses

Correlational analyses were conducted between the five time perspectives and the five domains of creativity. Consistent with the predictions, future time perspective significantly correlated with scholarly creativity ($r = .23$, $p < .01$), artistic creativity ($r = .25$, $p < .01$), and self/everyday creativity ($r = .31$, $p < .01$). Inconsistent with the predictions, however, future time perspective did not significantly correlate with performance creativity, nor mechanical/scientific creativity. Since future TP did not significantly correlate with performance nor mechanical/scientific creativity no regression analyses were conducted for those two types of creativity.

REGRESSION ANALYSES

Scholarly Creativity

An analysis of standard residuals was carried out on the data to identify any outliers, which indicated that one participant needed to be removed. Following this, another analysis of standard residuals was carried out on the data, which showed that the data contained no outliers (Std. Residual Min = -2.95, Std. Residual Max = 3.03). The data met the assumption of independent errors (Durbin-Watson value = 2.00). The histogram of standardized residuals indicated that the data contained approximately normally distributed errors, as did the P-P plot of standardized residuals, which showed points that were not completely on the line, but close. The scatterplot of standardized predicted values (i.e., scatterplot of standardized residuals) showed that the data met the assumptions of homogeneity of variance and linearity. The data also met the assumption of non-zero variances (Future TP = 0.21; Scholarly Creativity = 0.48). The results of the regression suggested that future time perspective explained 7% of the variance, $R2 = .07$, $F(1,261) = 19.01$, $p < .001$. Future time perspective significantly predicted scholarly creativity, $\beta = 0.40$, $t = 4.36$, $p < .001$.

Artistic Creativity

An analysis of standard residuals was carried out, which showed that the data contained no outliers (Std. Residual Min = -2.62, Std. Residual Max = 2.69). The data met the assumption of independent errors (Durbin-Watson = 1.95). The histogram of standardized residuals indicated that the data contained approximately normally distributed errors, as did the P-P plot of standardized residuals, which showed points that were not completely on the line, but close. The scatterplot of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity. The data also met the assumption of non-zero variances (Future TP = 0.21; Artistic Creativity = 0.74). The results of the regression suggested that future time perspective explained 6% of the variance, $R2 = .06$, $F(1,262) = 12.33$, $p < .001$. Future time perspective significantly predicted artistic creativity, $\beta = 0.47$, $t = 4.21$, $p < .001$.

Self/Everyday Creativity

An analysis of standard residuals was carried out, which showed that the data contained no outliers (Std. Residual Min = -2.62, Std. Residual Max = 3.23). The data met the assumption of independent errors (Durbin-Watson = 1.98). The histogram of standardized residuals indicated that the data contained approximately normally distributed errors, as did the P-P plot of standardized residuals, which showed points that were not completely on the line, but close. The scatterplot of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity. The data also met the assumption of non-zero variances (Future TP = 0.21; Self/Everyday Creativity = 0.35). The results of the regression suggested that future time perspective explained 10% of the variance, $R2 = .10$, $F(1,262) = 28.01$, $p < .001$. Future time perspective significantly predicted self/everyday creativity, $\beta = 0.40$, $t = 5.29$, $p < .001$.

DISCUSSION

SEX DIFFERENCES

Past-Negative Time Perspective

Females scored significantly higher on the past-negative TP than men and the effect size was small to medium ($d = .36$). It should be pointed out, however, that the mean score for females on the scale was 3.27 on a five-point scale with 3 labeled as neutral. The mean for males was 3.0, so the difference between men and women on the past-negative TP is small with females being slightly higher on the past-negative TP. This finding is consistent with previous research that has found women score higher than men on rumination, brooding, and reflection (Johnson & Whisman, 2013). It could be that women are slightly more likely than men to have a past-negative TP and this could lead to more rumination, however, rumination could also lead

to a past-negative TP. It could be that both past-negative TP and rumination are both caused by other factors, such as disasters or abuse. It needs to be clearly stated here that this study cannot lead to any causal conclusions.

Mechanical/Scientific Creativity

Males scored significantly higher on self-rated mechanical/scientific creativity than females with a small to medium effect size (d = .40). However, it is important to put the means for males and females in context. The mean for males was 3.0 on a five-point scale with 3 labeled as neither more nor less creative (than people of your age and life experience), whereas the mean for females was 2.64. As in the case of sex differences in past-negative TP, the sex differences in self-ratings for mechanical/scientific creativity are small. Nevertheless, this finding is consistent with previous research that has found men rate themselves as being higher in scientific creativity (Kaufman, 2006). It should be stated that just because men rate themselves higher in mechanical/scientific creativity, it does not necessarily mean that men are actually higher in mechanical/scientific creativity. Future research should attempt to measure actual mechanical/scientific creativity and how mechanical/scientific creativity may differ from mechanical/scientific related notions of intelligence.

ETHNIC DIFFERENCES

Performance Creativity

African Americans scored significantly higher on self-rated performance creativity than Caucasians with a medium effect size (d = 0.57). When interpreting this result, we should examine the group means and the questions that made up the performance creativity scale of the K-DOCS. The mean for African Americans was 3.27 on a five-point scale with 3 labeled as neither more nor less creative (than people of your age and life experience), whereas the mean for Caucasians was 2.79. Even though this difference is small, it is consistent with Kaufman's (2006) findings that African Americans rated themselves as having higher verbal artistic creativity than Caucasians. However, Kaufman also found that African American's rated themselves as being more creative than Caucasians (and most other ethnicities) in science, social, visual artistic, and sports creativity. Kaufman's (2006) findings might suggest that African Americans rate their own creativity higher than other ethnicities in general, however, the current study found that African Americans only rated their performance creativity significantly higher than Caucasians (and not higher than Native Americans). There was only sufficient data on those three ethnicities in this study to conduct comparisons. So, it may be that African Americans rate themselves as being higher in performance creativity, rather than actually having higher performance creativity than Caucasians. Future research should attempt to measure the actual performance creativity of different ethnicities to determine if there are actual ethnic difference in performance creativity.

CORRELATIONAL ANALYSES

McKay and Gutworth (2021) reported significant correlations between future TP and all five domains of creativity, whereas this study found future TP significantly correlated with only three domains of creativity (scholarly, artistic, and self/everyday). The current sample, however, is very different from their sample. The average age for the McKay and Gutworth sample was 37.55 years, whereas the average age for the current sample was 19.4 years. The ethnic breakdown for each sample was also very different. The McKay and Gutworth sample was primarily Caucasian (74.77% of their sample) with only 6.07% African Americans. The current sample was 37.5% African American, 27.3% Caucasian, and 15.5% Native American. In addition, McKay and Gutworth's sample was gathered online through Amazon's MTurk system that reaches a more general population, whereas the participants in this study were gathered through an online recruitment system for students currently completing an undergraduate Introduction to Psychology course at a university. These differences in the samples could account for the different findings. This demonstrates how important it can be to study TP and creativity across ages and ethnicities. Future research should seek to obtain access to more diverse populations in order to further study disparate findings in research on TP and creativity.

FUTURE TIME PERSPECTIVE PREDICTING DOMAINS OF CREATIVITY

It was predicted that future TP would predict all five domains of creativity, however, that was not found. Indeed, future TP was not significantly

correlated with mechanical/scientific creativity, nor performance creativity. As predicted, however, future TP did significantly predict scholarly, artistic, and self/everyday creativity. These findings are consistent with the idea that future TP influences creativity. However, these findings also suggest that future TP may not contribute to all types of creativity. Further research will need to study future TP in conjunction with different domains of creativity to more clearly determine the types of creativity that are influenced by future TP.

It may seem counterintuitive that a future time perspective would contribute to creativity, however, it may depend on the domain of creativity. Many people may see creativity as something that just happens and does not need any planning or continuing effort over time. However, research has found that individuals need around ten years of experience in a field before they begin to make creative contributions (Simonton, 2000). Thus, some domains of creativity might benefit from a future time perspective. It makes sense that a future time perspective (involving planning for the future, weighing the costs and benefits, and persisting at uninteresting tasks if it helps one to get ahead) would contribute to scholarly creativity. Planning and persisting can be important aspects of scholarly creativity. In addition, a future time perspective also makes sense when it comes to artistic creativity. Painters and other artists must persist over time in developing their skills and planning their artistic contributions. It may be less clear how a future time perspective contributes to self/everyday creativity. Self/everyday creativity involves understanding what makes you happy, making others feel relaxed and having a balance in life. When considering these aspects of self/everyday creativity it seems that a future time perspective could also contribute to it. Planning for the future and weighing pros and cons would also help one to excel in self/everyday creativity.

Even though future TP did predict scores in three domains of creativity, the percentage of the variance accounted for by future TP was very small. First, it was found that future TP explained 7% of the variance in scholarly creativity. Second, future TP explained 6% of the variance in artistic creativity. Third, future TP explained 10% of the variance in self/everyday creativity. Previous research (Chen, Zhang & Qi, 2020; Meyer *et al*., 2019) found small to medium effect sizes for the influence of future temporal distance on creativity. In addition, McKay and Gutworth (2021) found that past, present, and future TP accounted for a small to medium percentage of the variance in predicting the K-DOCS domain general score. More research will be needed to further examine the effect sizes of future TP on different types of creativity. Future research will need to focus not only on statistical significance, but also on effect sizes. Even if future TP accounts for a small percentage of the variance in different types of creativity, its contribution to creativity may still be important. Indeed, it is important to study all factors that contribute to creativity. It may be that a future TP combines with other factors to explain more of the variance in creativity. Future research should examine future TP in combination with other factors.

LIMITATIONS

There are several limitations in the current study. First, the information obtained in this study was obtained through self-report measures. It may be that participants could not accurately report their TP or creativity, or participant's answers could have been influenced by social desirability. Second, the measure used for creativity in this study (the K-DOCS) obtained participants' self-ratings of creativity. Self-ratings of creativity may not accurately reflect participants' actual creative ability. This study did not measure actual creative products, nor creative achievements. Future research should endeavor to develop ways to measure actual creative achievements in the different domains of creativity. Third, the participants in this study were undergraduate students currently enrolled in undergraduate Introduction to Psychology courses. Future research would benefit from studying additional groups of participants, such as individuals from different professions.

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