

Child's Play: Facilitating the Originality of Creative Output by a Priming Manipulation

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When children play, they often do so in very original ways. However, with the responsibilities of adulthood, this playful curiosity is sometimes lost and conventional responses often result. In the present study, 76 undergraduates were randomly assigned to 1 of 2 conditions before creative performance was assessed in a version of the Torrance Test of Creative Thinking (TTCT; E. P. Torrance, 1974). In a control condition, participants wrote about what they would do if school was cancelled for the day. In an experimental condition, the instructions were identical except that participants were to imagine themselves as 7-year-olds in this situation. Individuals imagining themselves as children subsequently produced more original responses on the TTCT. Further results showed that the manipulation was particularly effective among more introverted individuals, who are typically less spontaneous and more inhibited in their daily lives. The results thus establish that there is a benefit in thinking like a child to subsequent creative originality, particularly among introverted individuals. The discussion links the findings to mindset factors, play and spontaneity, and relevant personality processes.

Keywords: creativity, originality, extraversion, priming, play

When you play a role of an adult, you take yourself and life very seriously. Spontaneity, lightheartedness, and joy are not part of that role. —(Tolle, 2005, p. 92).

The benefits of adulthood include lower levels of impulsivity (Rothbart & Bates, 2006), greater cognitive control (Rueda, Posner, & Rothbart, 2005), and greater abilities to apply oneself to the important domains of love and work, conventionally defined (McCrae & Costa, 1991). However, such developments in maturity may not come without a cost. Specifically, adulthood levels of maturity often co-occurs with processing tendencies and behaviors that are more rule bound, more routine, and often less flexible and creative (Davis, 1999; James, 1890). Thus, the very same maturational processes may both facilitate goal-directed efforts and undermine cognitive flexibility and originality (Plucker, Beghetto, & Dow, 2004; Taylor & Getzels, 1975).

The child's self-concept is not well formed and does not guide processing and behavior to the same extent as among adults (Eder & Mangelsdorf, 1997). Furthermore, the child's mindset can be characterized as much more focused on immediate desires and spontaneous behaviors relative to prohibitions in this regard (Davis, 1999). Although a childlike mindset is likely to result in a greater degree of impulsive behavior (Barkley, 1997), it may facilitate creativity as well. Consistent with this idea, prominent theories link creativity to a spontaneous, playful mindset (e.g., Langer, 1989) that is low in self-consciousness (Csikszentmihalyi & Csikszentmihalyi, 1988).

Such lines of thinking informed the present study. We first borrow from theories of creativity in support of the idea that a childlike mindset should facilitate original thinking. We then consider the important question of whether creative facilitation of this type is dependent on biological age or, alternatively, whether creative originality can be manipulated in a short-term state-dependent manner. Finally, we consider the potential effects of such a manipulation in the context of the two Big 5 personality traits—extraversion and openness to experience—that are of most importance in understanding creative performance (Peterson, Smith, & Carson, 2002).

Is a Childlike Mindset Conducive to Creativity?

Creativity is multifaceted in nature, but two important components of it are originality and fluency (Runco, 2008). A response is original to the extent that it is novel and unique among the population of interest while still feasible and sensible (Torrance, 2008). Fluency is defined in terms of the number of responses generated, whether they are original or not (Torrance, 2008). Fluency is dependent on the maturation of the frontal cortex, which is immature among children (Olesen, Macoveanu, Tegnér, & Klingberg, 2007). Thus, to the extent that manipulating a childlike mindset is beneficial to creative performance, it is unlikely to involve the fluency of creative output.

On the other hand, a childlike mindset may facilitate creative originality. For example, Rosenblatt and Winner (1988) distinguished *preconventional*, *conventional*, and *postconventional* thinking styles and linked them to distinct developmental phases. In the preconventional developmental phase (ages 6–8), children's creative productions are often spontaneous and novel, in part due to a lack of self-censure (Cromptley, 2001). In the conventional developmental phase (ages 8–12), creative productions are increasingly rule bound, to the detriment of their originality. In the

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postconventional developmental phase (12–adulthood), there is some degree of freedom from rules, but creative productions are still guided by logic and routine. This framework (Rosenblatt & Winner, 1988), as well as others (Case & Mueller, 2001; Piaget, 1926), therefore suggests that originality may be facilitated by childlike thinking processes.

From a complementary perspective, adults develop routinized strategies to deal with presented tasks and do so by relying upon symbolic logic and reasoning (Plucker et al., 2004). Problem-solving activity tends to dominate in this connection and the general goal is to produce the “correct” solution to a given problem or item (Plucker et al., 2004). Although this thinking style should facilitate convergent thinking processes, correct answers, and logical reasoning, this same thinking style may undermine divergent thinking and creativity to a significant extent (Langer, 1989).

In an educational context, Gardner (1982) observed higher levels of artistic creativity and aesthetic expression among preschool children relative to older children. On the basis of such sources of data, he suggested that educational training after the preschool years is likely to undermine the processes that produce creative thinking and output. Gardner’s suggestions are consistent with other sources of data. Torrance and Myers (1961) found that especially creative children are often chastised by peers for their apparent eccentricities. Dawson, D’Andrea, Affinito, and Westby (1999) found a similar dynamic among teachers. Although teachers agreed with the abstract goal of fostering and encouraging creativity in children, their in-class demeanor and nonverbal behaviors appeared to be antithetical to such a goal (Dawson et al., 1999).

The potentially pernicious influence of the education system on creativity (Gardner, 1982) is perhaps best understood in motivational terms. Historically, and increasingly so, our educational system has sought to “teach to the test” to facilitate narrowly “correct” convergent answers to a problem (Sawyer, 2006). Such a focus on performance outcomes has been shown to undermine intrinsic motivation, defined in terms of engaging in a task or endeavor because one is interested in it rather than motivated to get a good score (Deci, Koestner, & Ryan, 2001). Low levels of intrinsic motivation, in turn, predict low levels of creativity and this has been shown in multiple literatures (Csikszentmihalyi, Abuhamedh, & Nakamura, 2005; Silvia, 2006). In summary, what the American education system arguably does to older children and young adults is to undermine the sorts of intrinsic motivational processes that facilitate creative thinking (Saracho, 1992; Wallach & Kagan, 1965). A question of central interest to us was whether such apparent inhibitory influences on creative performance are irreversible or, rather, mutable.

Can the Spark of Childhood Creative Thinking Be Recaptured?

Maturation processes of the sort reliant on frontal lobe maturation and academic experience cannot be easily undone. At the same time, popular books have long touted the potential benefits to creativity that are likely to follow from contacting the child within (Kováč, 1998; Livingston, 1999; Russ, 1998). Scientific theories of creativity, too, have emphasized the state-related nature of creative performance (e.g., Csikszentmihalyi & Csikszentmihalyi, 1988) and the importance of motives related to curiosity and play

in this connection (e.g., Silvia, 2006). There is potential reason for thinking that manipulating a childlike mindset might facilitate creative originality.

The social cognition literature has increasingly shown that mindsets can be manipulated on a short-term basis. Motivations toward approach and avoidance can be manipulated in this manner (Higgins, 1997), as can motivational states related to helping (Macrae & Johnston, 1998), aggression (Anderson & Bushman, 2002), self-regulation (Gollwitzer, 1999), and, indeed, creativity (Friedman & Förster, 2005). We are unaware of manipulations seeking to facilitate a childlike mindset, but this mindset too should be amenable to a priming manipulation. Accordingly, we sought to facilitate a childlike mindset by asking individuals to imagine that they were 7-year-old children with free time. We hypothesized that assignment to the childlike mindset condition would lead to higher levels of creative originality on an objective task (a version of the Torrance Test of Creative Thinking [TTCT]; Torrance, 1974), but that effects of this type might be somewhat particular to individuals who are typically serious and sober, rather than spontaneous, in their daily behaviors.

Creativity-Related Traits and Processes

Before the 1980s, personality trait psychology was somewhat chaotic in that there were hundreds of traits proposed, with uncertain relationships between them (Allport & Odbert, 1936; Cattell, 1943). In the 1980s and 1990s, this situation changed in that a consensual model of the broadest trait constructs—termed the *Big 5* (McCrae & Costa, 1999) or the five-factor model (Goldberg, 1999)—was clarified to the point that it could organize previous trait-related literatures. Since then, it has been apparent that extraversion and openness to experience are the two of the *Big 5* traits have particular relevance to understanding creative performance (Peterson et al., 2002). We assessed both of these traits in our study and hypothesized different patterns in relation to the priming manipulation.

Openness to experience has been conceptualized in ability-related terms (McCrae, 1987). Individuals high in openness are thought to have greater capacities for flexible thinking relative to individuals low in openness (McCrae & Costa, 1990). Furthermore, such differences are thought to be reliant on individual differences in frontal lobe functioning (DeYoung, 2006). In support of this ability-related perspective, openness to experience is a robust predictor of creative performance, particularly in relation to its originality (Carson, Peterson, & Higgins, 2005; Feist, 2006). Such considerations led us to hypothesize that our manipulation of a childlike mindset would *not* interact with openness to experience. Rather, individuals higher in openness to experience should exhibit higher creative originality in both conditions of the study.

On the other hand, extraversion’s potential link to creative performance should be viewed quite differently. Although extraverted individuals are typically more spontaneous and playful (John & Srivastava, 1999), such individual differences should not be viewed in ability-related terms. Introverted individuals are fully capable of responding to positive emotion inductions (Baird, Le, & Lucas, 2006); acting in a spontaneous, extraverted manner (Fleeson, 2001); and benefiting from such activities (Fleeson, 2007). Thus, what differentiates relatively more introverted from rela-

tively more extraverted individuals is what they typically do rather than what they can do given appropriate priming conditions or circumstances.

Because extraverts are typically spontaneous in their thinking styles and behavior (McCrae & Costa, 1999), a manipulation designed to facilitate spontaneity in thought should have little effect at high levels of extraversion. By contrast, because introverts have capacities for spontaneous thinking and behavior that are latent rather than typical, the same manipulation should be particularly efficacious at low levels of extraversion. Accordingly, we hypothesized that extraversion and the manipulation of a childlike mindset should *interact* and do so such that the manipulation would facilitate creative originality particularly among introverted individuals. Such personality-process considerations, we believe, are important, and they are revisited in the Discussion.

Overview of Study

We manipulated a childlike mindset and examined its effects on a short version of the TTCT, as would be useful in the context of short-lived priming effects. Thinking of oneself as a child with free time, versus an adult with free time, was hypothesized to increase creative originality but not creative fluency. We also assessed the personality traits of extraversion and openness to experience. We hypothesized that the manipulation would interact with the trait of extraversion, in effect inducing a more spontaneous mindset among individuals who are not typically spontaneous in their behavior (McCrae & Costa, 1999). On the other hand, openness to experience was hypothesized to predict originality regardless of the manipulation.

Method

Recruitment and Participants

Participants were student volunteers from North Dakota State University seeking extra credit for their psychology classes. Primarily, such students tend to be freshmen or sophomores who are enrolled in introductory psychology. No special recruitment efforts occurred. Rather, students seeking extra credit could sign up for any of a number of psychology studies conducted in the department by logging into our Sona participant registration software (Sona Systems, Inc., Tallinn, Estonia) through the Internet and entering their name within a relevant time slot.

Participants volunteering for the present study did so in relation to a relatively generic study title: "Personality and Emotion." The brief Internet description of the study stated that it would involve a writing task and some other tasks as well. Through such recruitment procedures, 76 (55 male, 21 female) undergraduates constituted the participant sample. The majority of participants were Caucasian in race (>90%) and their mean age was 20.5.

Manipulation

We sought to manipulate a childlike mindset before assessing creative performance. To do so, we presented participants with an open-ended prompt and asked them to write for 5–10 min in response to it. This is a common set of procedures for manipulating states or concepts in the social cognition literature (Bargh &

Chartrand, 2000). Participants were randomly assigned to control ($n = 40$) or experimental ($n = 36$) conditions.

In both conditions, instructions were very similar and asked individuals to imagine that school was canceled for the day in question. In both conditions, participants were asked to put themselves into the situation and be detailed and specific in their answers, writing on what they would do, think, and feel in such a situation. In other words, the conditions were matched in terms of free time and opportunities for pursuing wanted endeavors. The only difference was that we added the phrase "You are 7 years old" to the experimental condition before presenting the remaining prompt-related instructions. Thus, the difference between the conditions involved a mere handful of words, a tight control over the conditions ensuring that the only relevant difference was whether one viewed oneself as a child or adult in the situation.

We read all priming protocols to gain further insight concerning the mechanisms likely involved. Participants in the control (adult) condition often wrote about sleeping extra hours and catching up on homework or studying. The written responses from the experimental condition were very different. They typically focused on desires rather than obligations and often involved playing with friends or seeking rewards from the environment (e.g., candy). Thus, the manipulation appeared highly successful in encouraging spontaneous and playful thinking in the childlike mindset condition. We present example written excerpts in the Appendix.

Measures

Abbreviated Torrance Test for Adults (ATTA; Goff & Torrance, 2002). To examine priming effects, we used the ATTA, a shortened form of the TTCT (Torrance, 1974), arguably a gold standard measure in the creative performance literature (Kim, 2008). The ATTA consists of three activities, one involving verbal responses and two involving figural responses (e.g., using incomplete figures to make pictures). Goff and Torrance provide evidence for the reliability and validity of ATTA scores. Responses are scored for fluency (i.e., a count of the number of pertinent responses) and originality (i.e., the number of responses that are unique and original), with summary scores summed across the three activities (Goff & Torrance, 2002). Originality was scored according to the ATTA scoring manual. A common response from the manual was given a score of 0, and other responses were given a score of 1. In addition, there was a possibility of earning originality bonus points.

Before scoring the ATTA responses for the present study, Darya L. Zabelina first achieved a very high level of agreement with example responses from the ATTA manual. Using manual-based scoring procedures, she then scored a subset of the ATTA protocols from the present study and mailed these forms to the test developers. Again, a very high level of scoring agreement was obtained. Subsequently, then, Zabelina scored the remaining ATTA protocols from the study and did so unaware of the condition and personality scores of the participant involved. Such procedures ensure consistency in scoring with the ATTA test developers and do so in such a way that expectancy effects could not compromise the results obtained.

Extraversion and openness to experience. We assessed extraversion and openness using Goldberg's (1999) broad-bandwidth

trait scales. Goldberg is among the most prominent researchers in the Big 5 assessment tradition (e.g., Goldberg, 1993), and his broad-bandwidth scales for the Big 5 correlate highly with alternative Big 5 measures such as those obtained from the NEO Personality Inventory (NEO-PI; McCrae & Costa, 1992) or Big Five Inventory (BFI; John & Srivastava, 1999). Goldberg's (1999) scales are also as reliable, if not more so, than alternative trait scales (Goldberg et al., 2006).

In specific terms, participants were asked to rate the extent (1 = *very inaccurate*; 5 = *very accurate*) to which the 10 statements indicative of extraversion (e.g., "am the life of the party") and openness (e.g., "have a vivid imagination") generally characterize the self. Both scales include reverse-scored items to guard against acquiescence tendencies. Goldberg et al. (2006) reported Cronbach alphas of 0.87 and 0.84 for extraversion and openness to experience, respectively, and similar values were found in the present study (extraversion = 0.86; openness = 0.82). Thus, the scales were reliable. For validity data, see Goldberg (1999) and Goldberg et al. (2006), as well as the findings reported later.

Mood. We viewed our manipulation as a cognitive one involving a childlike (vs. adultlike) mindset rather than one whose effects would be mediated by current mood. We assessed mood states using two items. Participants were asked to rate their mood on a 7-point Likert-type scale, ranging from *very positive* (1) to *not positive* (7) for Question 1 and from *very negative* (1) to *not negative* (7) for Question 2. Ratings for the negative mood item were reverse-scored and then a composite mood variable was created by averaging across the two items. Although the alpha for this two-item measure of mood was modest, $\alpha = 0.54$, we deemed the mood scale at least useful to check for possible manipulation-related effects on mood.

Procedure

The laboratory consisted of six private cubicles, and participant sessions thus included between 1 and 6 participants. On entering the lab, participants were informed that the study would consist of a writing task (i.e., the priming manipulation), a performance-based task (i.e., the ATTA), and then some questionnaires (i.e., personality assessment). The manipulation of mental set involved written instructions that suggested writing would continue for 10 min. However, and consistent with similar priming manipulations administered in the social cognition literature (Gasper & Clore, 1998), participants were interrupted after 7 min and told that the writing exercise would continue later in the experimental session. Such procedures are often used in the social cognition literature to ensure that no closure has occurred and thus that primed thoughts might remain activated for a longer period of time.

After the writing task, participants completed the ATTA, with 3 min allocated for each of the three activities (i.e., 9 min in total). After the ATTA, we assessed mood, extraversion, and openness to experience by the use of a MediaLab-programmed questionnaire presented on computer. The order of the tasks was designed to ensure that the ATTA was completed immediately after the priming manipulation and that performance on the ATTA could not be biased by previous considerations of one's mood or traits. In support of this order of tasks, there was no effect of the manipulation on trait levels of extraversion and openness to experience, $F_s < 1$. Such results are consistent with a body of findings

showing that trait scores are extremely stable (McCrae & Costa, 1994) and not influenced by priming or performance tasks of an implicit cognitive type (Robinson & Neighbors, 2006).

Results

Descriptive Results

On the ATTA test of creative performance, fluency scores averaged 10.72 ($SD = 2.98$) and originality scores averaged 5.00 ($SD = 2.89$). Such values closely match those reported by Goff and Torrance (2006). Extraversion and openness to experience averaged 2.97 ($SD = 0.38$) and 2.79 ($SD = 0.25$), respectively. We then correlated these four individual difference variables with each other; the results are reported in Table 1. There was a negative correlation between fluency and originality, but it was modest. In general terms, fluency and originality have been shown to be largely independent dimensions of creative performance (Kim, 2006). For this reason, modest negative correlations should sometimes be found, depending on the sample.

Table 1 also shows that the traits of extraversion and openness to experience were independent (i.e., uncorrelated), as is typically observed in the Big 5 literature (McCrae & Costa, 1999). In zero-order terms, extraversion did not predict creative fluency or originality. However, we hypothesized that extraversion would interact with the priming manipulation and this hypothesis is examined later. Finally, Table 1 shows that we replicated a frequently observed relation between the trait of openness to experience and higher levels of creative originality (Batey & Furnham, 2006; McCrae, 1987).

Effects of the Manipulation

We hypothesized that a childlike mindset would facilitate creative originality but would be unlikely to facilitate the fluency of creative output. Both hypotheses were supported. Individuals randomly assigned to the mindset condition involving childlike thinking subsequently exhibited higher levels of creative originality ($M = 5.72$) than did those in the control condition ($M = 4.33$), $F = 4.53$, $p < .05$. On the other hand, the manipulation did not influence fluency scores, $F < 1$. Interactions between the trait variables and the manipulation in predicting fluency scores were similarly not significant, $F_s < 1$. Thus, all of our results implicate the originality of creative output rather than its fluency.

Additional analyses were also performed. First, we expected the manipulation to influence creative originality similarly among both men and women (Baer, 2008). To support this point, we added gender to the Condition \times Trait analyses reported later. There were no three-way interactions involving

Table 1
Correlations Among Individual Difference Variables

Variable	Originality	Extraversion	Openness
Fluency	-.30*	-.03	-.16
Originality	—	.02	.32*
Extraversion		—	.09

* $p < .05$.

participant gender, $p_s > .20$. Thus, the findings reported are not modified by gender, and participant gender was therefore dropped from further consideration. Second, we hypothesized that the effects of the manipulation would not be mediated by mood states. In support of this point, no manipulation-related effects on mood were found, regardless of whether main effects for condition or Condition \times Trait interactions were involved, $p_s > .30$. Thus, the findings reported appear independent of possible manipulation-related influences on mood.

Results Involving the Trait Variables

With originality scores as the dependent measure, we performed two multiple regressions examining potential interactive effects involving a given trait (e.g., extraversion) and the priming manipulation. In the multiple regression involving openness to experience, openness was z scored, the manipulation was dummy coded (-1 = control condition, and 1 = experimental condition), and an interaction term was calculated by multiplying these predictors (Aiken & West, 1991). All three predictors—both main effects and the interaction variable—were then entered as simultaneous predictors of creative originality. A parallel analysis was performed in which the relevant trait was extraversion rather than openness to experience.

In the first multiple regression, there was a main effect for openness, $t = 2.74$, $p < .01$, $\beta = 0.30$, indicating that individuals higher in openness to experience produced more original responses. There was also a main effect for condition, $t = 2.03$, $p < .05$, $\beta = 0.22$, indicating that individuals randomly assigned to the condition inducing a childlike mindset produced more original responses. On the other hand, there was no Openness \times Condition interaction, $t = -0.11$, $p = .91$ (see Table 2). Estimated means for this analysis, as a function of low (-1 SD) versus high (1 SD) levels of openness to experience (Aiken & West, 1991), are shown in Figure 1. As shown there, openness to experience and the manipulation were additive rather than interactive predictors of creative originality. Results are summarized in Table 2.

In the analysis involving the trait of extraversion, the multiple regression results were quite different. There was no main effect for extraversion, $t = -0.17$, $p = .87$, indicating that extraverts were not generally more original in their creative responses. The main effect condition, however, was significant, $t = 2.22$, $p < .05$, $\beta = 0.25$. Of final importance, there was a significant Extraversion \times Condition interaction, $t = -2.37$, $p < .05$, $\beta = -0.26$ (see Table 3). Estimated means for this interaction were calculated for individuals low (-1 SD) versus high (1 SD) in extraversion, for each of the two conditions and are displayed in Figure 2.

Table 2
Creative Originality as a Function of Condition, Openness to Experience, and Their Interaction

Variable	<i>B</i>	<i>SE B</i>	<i>b</i>	<i>t</i>
Condition	.64	.32	.22	2.03*
Openness	.87	.32	.30	2.74*
Condition \times Openness	-.04	.32	-.01	-0.11

* $p < .05$.

The pattern of findings reported in Figure 2 suggests that the manipulation of a childlike mindset facilitated creative performance only at low levels of extraversion. To reinforce this point, we examined the effect of the condition manipulation among those below versus above the median in extraversion. Along the 1–5 introversion–extraversion scale, the median was 3, the theoretical midpoint of the scale. The median split procedure resulted in 34 introverts and 35 extraverts, equally distributed among the two conditions. Among introverts, there was a significant main effect for condition, $t = 2.03$, $p < .05$. Among extraverts, there was no such effect, $t = 0.36$, $p = .72$. Thus, although the manipulation generally facilitated original creative performance, this was particularly true to the extent that participants were low in extraversion.

Discussion

A Childlike Mindset

Young children approach novel tasks in terms of play and exploration and their output is often highly original (Gardner, 1982). As children age into adults, some of this spark of creative originality may be lost, but it is important to determine why this is so. There are at least three possible explanations for this maturational trend. First, the regions of the frontal cortex responsible for rule-based behavior develop more slowly than other regions of the brain (Casey, Thomas, & McCandliss, 2001) and thus increased conventionality with maturation may reflect a relatively permanent change in the brain's hardware and software.

Second, educational practices increasingly discourage play, and encourage conventional responding, over time (Kaila, 2005). Thus, creativity, so important to novel and original thinking, may be stifled by the education system. Although these two explanations for developmental trends are quite different, both seem to emphasize the relatively inevitable decline in creative originality that should occur from childhood to adulthood.

Although our study was not a developmental one, it nevertheless provides support for a third explanation of developmental trends. The mindset of children, we suggest, is one in which a task is seen in terms of opportunities for play and exploration. The mindset of adults, on the other hand, is likely to involve trying to find the "correct" conventional solution to a presented task or problem (Gardner, 1982). This conventional mindset should facilitate intelligent decision making but may undermine (at least to some extent) the originality of creative productions (Rosenblatt & Winner, 1988; Taylor & Getzels, 1975).

Mindsets are flexible (Gollwitzer, 1999), and thus from a mindset perspective, it should be quite possible to facilitate a childlike mindset even among adults. If so, thinking of oneself as a young child for some period of time may facilitate creative performance, particularly in terms of the originality of one's responses. To provide support for this idea, we randomly assigned individuals to one of two written instruction conditions and did indeed find that this mindset-related manipulation facilitated creative originality.

Our results therefore suggest that developmental trends in creativity over time (Gardner, 1982) may reflect changes in task mindset as much or more so than they reflect changes in brain maturation or educational practices. In other words, it is possible to

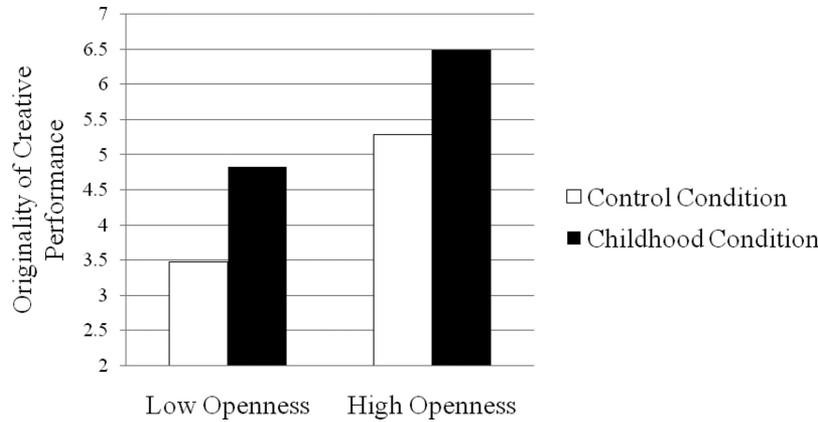


Figure 1. Creative originality as a function of condition and openness to experience.

recapture the spirit of play and exploration characteristic of childlike thinking. Although we are unaware of any previous studies that have facilitated creative originality by a manipulation of the present type, our results are nonetheless consistent with other theories and sources of data.

The Importance of Play and Exploration

The idea that there is an “inner child” within each of us that can facilitate creative performance is somewhat ubiquitous in popular culture. The inner child is presumably playful in nature, not especially self-conscious, and less bound to societal restrictions and rules (Gardner, 1982). Studies in personality and social psychology have increasingly demonstrated the benefits of this mode of being, thereby demonstrating empirical support for long-standing humanistic assumptions (Sheldon & Kasser, 2001). In short, although it is often beneficial to approach life tasks as a conventional adult, it is not always beneficial to do so.

The domain of creative originality is one realm in which play and exploration appear particularly beneficial. This appears true in relation to motivational states related to curiosity (Kashdan, Rose, & Fincham, 2004), flow (Csikszentmihalyi & Csikszentmihalyi, 1988), interest (Silvia, 2006), intrinsic motivation (Ryan & Deci, 2002), and mindfulness (Langer, 1989). Thus, what appears to be common to multiple theories of creativity is engagement with a task, playfulness in this regard, and a lack of self-conscious monitoring of output (Nigg, 2000; Robinson & Tamir, 2009).

What is important to our study is the suggestion that thinking of oneself as a child, for a short period of time, appears to facilitate the sorts of playful, exploratory thinking processes conducive to

creative originality (Kashdan et al., 2004; Silvia, 2006). Much work remains to be done, however. In dispositional terms, it would be of interest to determine whether more creative individuals view themselves as more childlike in their approach to creative performance tasks. In experience-sampling studies, it would be important to determine whether flow and creativity co-occur with tendencies to view the self as more childlike versus adultlike in nature. Finally, the applied significance of our manipulation has yet to be determined. Regardless, we view the present findings as supportive of such research efforts.

Trait-Related Findings and Implications

We assessed two traits in our study, both of which have been linked to creativity in previous research (Peterson et al., 2002). At the same time, the correlates and processes of extraversion and openness to experience are quite different (McCrae & Costa, 1999). From a personality-processing perspective, then, we can gain further insight into the effects of our manipulation by examining potential trait–state interactions (Robinson, 2007). To the extent that such an interaction is found, it is likely to implicate the processes specific to the given trait.

Openness to experience reflects a general tendency toward conventional (low openness) versus nonconventional (high openness) thought, experience, and behavior (McCrae & Costa, 1999). Although openness to experience predicted the originality of output in the ATTA, there was no interaction with the state-related manipulation of a childlike mindset. Thus, we suggest that the manipulation of childlike thinking did not simply promote nonconventional thinking. If it had, the manipulation should have been more effective among individuals low, relative to high, in openness to experience.

Extraversion reflects a general tendency toward nonspontaneity (low extraversion) versus spontaneity (high extraversion) in thought, experience, and behavior (McCrae & Costa, 1999). Although there was some tendency for extraverts to be more original in their creative productions than introverts (see Figure 2), the more important point was that the manipulation was effective only among relatively introverted individuals. From this interaction, we suggest that the manipulation of a childlike mindset facilitates the sort of spontaneity in thinking and behavior characteristic of high

Table 3

Creative Originality as a Function of Condition, Extraversion, and Their Interaction

Variable	<i>B</i>	<i>SE B</i>	<i>b</i>	<i>t</i>
Condition	.71	.32	.25	2.22*
Extraversion	-.05	.32	-.02	-0.17
Condition × Extraversion	-.76	.32	-.26	-2.37*

* $p < .05$.

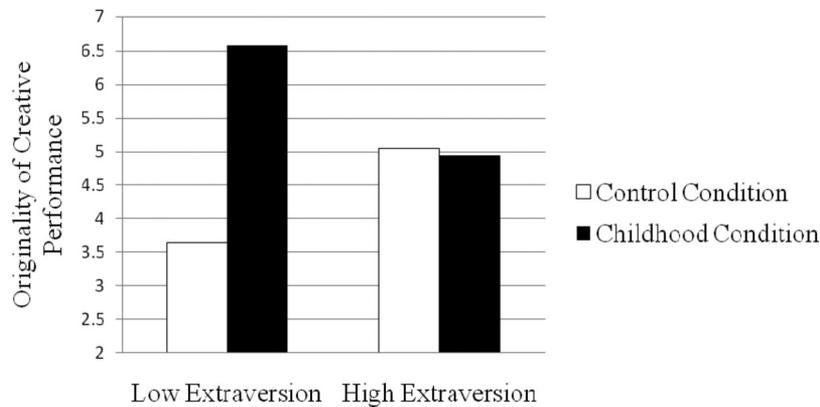


Figure 2. Creative originality as a function of condition and extraversion.

levels of extraversion. For this reason, it was particularly influential among introverts, who tend to be inhibited in nature, relative to extraverts.

Applied Implications

Although our study focused on basic processes, the findings have potential applied value as well. In the domain of educational practices, our findings suggest that the goal of fostering creativity in children is a realizable one. In addition to activities designed to facilitate convergent thinking and problem solving, the educational curriculum should also provide opportunities for spontaneity and play (Panksepp, 2007). The inclusion of such activities may be effective in countering the documented decline in creativity across increased years of schooling (Dawson et al., 1999; Gardner, 1982; Torrance & Myers, 1961), perhaps particularly so among introverted individuals.

Linking the present findings to business practices is less certain, but the fact is that hard work and motivation are often not the issue in such settings (McClelland, 1987). Rather, there appears to be a great need to foster innovation as well (Mumford, 2000; Simonton, 2000). Mandating such innovative thinking processes is unlikely to be effective, as doing so is quite antithetical to the manner in which curiosity and innovation naturally work (Ryan & Deci, 2001; Silvia, 2006).

Instead, a very different approach to facilitating innovative thinking is likely required. Our results suggest that interventions facilitating a focus on fun and spontaneity are likely to be effective. Potential interventions along such lines might include guided imagery exercises designed to facilitate a childlike mindset, games, and/or interventions designed to focus individuals on what they want to do rather than what they feel that they have to do. Of most importance, our results reveal that even very short-term interventions designed to focus individuals on spontaneous thinking and play are likely to be effective in fostering creative originality.

Finally, creativity is an important component of psychological well-being and one that has been increasingly emphasized in the literature (Ryan & Deci, 2001). To the extent that one is focused on desires rather than obligations or intrinsic rather than extrinsic reasons for performing a task, psychological well-being appears to benefit (Higgins, 1997; Ryan & Deci, 2000). Although we did not

find that our manipulation of a childlike mindset influenced mood states, such a mindset is likely to be beneficial to psychological well-being over longer periods of time (Robinson & Tamir, 2009).

Limitations, Future Directions, and Conclusions

The sample was primarily male, and thus our capacity to fully evaluate possible gender differences was somewhat limited. We regard the lack of an influence on mood states as an important factor in better understanding the effects of the manipulation, but the mood measure was not as reliable as it could have been. The manipulation influenced creative originality as assessed by an established test (the ATTA), but it seems useful to extend the present priming perspective to other measures of creativity as well. We suspect that there are downsides to a childlike mindset (e.g., behavioral impulsivity, problems with convergent thinking), and it would be interesting to examine such outcomes as well. The bottom line is that our manipulation of a childlike mindset appears novel to the literature, and thus there are many interesting future directions of research that can be pursued from this mindset perspective.

In concluding, Kris (1952) presented a fascinating psychodynamic view of creativity that emphasized the benefits of regression in the service of the ego. Our findings suggest that it is possible to facilitate this often-functional regressive process by encouraging adults to think of themselves as children for a short period of time. This manipulation facilitated creative originality and thus provides empirical support for theories that view originality in terms of a childlike mindset (e.g., Gardner, 1982).

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Appendix

Examples of Written Responses From Control and Experimental Conditions

Control Condition

"I would go back to bed for a while if school was canceled. I would then get up, check my email, call work to see if they needed me to do anything there, and since they probably would I would go to work until I was done. I then would go home to finish any homework or other things around my apartment, such as cleaning. I would try to get a workout in somewhere or do something outside if it was nice"

Experimental Condition

"I would start off by going to the ice-cream shop and getting the biggest cone I could get. I would then go to the pet store and look at all the dogs. After that I would go visit my grandma and play a few games of gin. Then she would make me cookies and give me a huge glass of milk. I would then go for a walk, where I would meet up with my friends and we would play in the park for hours"

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