

# Creativity in problem solving and artistic expression - the same psychological process?

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What is creativity? Some psychological research describes creativity as multifaceted. For example, fluency, flexibility, and divergent thinking are often distinguished as components of creative problem solving (e.g., Butler et al., 2003). Yet examining the novel ways we invent solutions to problems is only one way we study creativity. We also study creativity as a form of expressiveness. For example, creativity has been studied by examining original poems and stories (e.g., Baer 1997, 2003). Do we use the one word "creativity" to describe two very different things, processes we might call "inventiveness" and "expressiveness?" Or is creativity one thing, the same set of psychological processes applied across contexts? For the following study, I hypothesized two distinct links between expressiveness and inventiveness. First, I hypothesized that creativity is one thing; those who are more expressive are also more inventive. Second, I hypothesized that when confronted with need to be creative, people will choose one form of creativity at the expense of the other, rather than choosing mediocrity across both forms.

## Method

Twenty-two (22) undergraduates from a small New England liberal arts college participated in the study. Participants were mostly freshman (81%), women (73%), white (73%), and 19 years of age (avg. = 19.33, s.d. = 0.53). Each participant completed three measures of creativity in counter-balanced orders, (1) To measure of inventive creativity, participants used odd house-hold objects were used to get a marble into a distant cup. (2) To measure expressive creativity, participants represented 2 emotions using construction paper of odd colors, glue, and scissors. (3) To measure

both forms of creativity, participants made a gift for a hypothetical elderly relative. She likes pretty things and looking out her window, but sadly has too sensitive eyes to look outside during the day. Participants made her a pretty gift to facilitate her ability to look out her window.

Two groups of 10 undergraduate students rated the expressive creativity of the emotion expressions, inventive creativity on the marble task, the inventiveness and expressiveness of participants sensitive-eye task product, the number of strategies on the marble task, and the extent to which each emotion expression was different from a flat rectangular depiction (e.g., a 3 dimensional 'sculpture'). Reliability ranged from .86 to .98 as calculated by comparing the 2 groups ratings using intra-class correlation coefficients. For analyses, ratings from both groups were combined.

## Results

To examine the possibility that those who are most expressively creative are also the most inventively creative, I compared performance on the emotion and marble tasks. As expected, ratings of creativity on the tasks were positively correlated,  $r=.49$ ,  $p<.05$ . Similarly, the number of strategies used in the marble tasks was positively correlated with the deviation of the emotion expressions from flat rectangles,  $r=.52$ ,  $p<.05$ . To examine the possibility that people choose one form of creativity at the expense of the other, I compared ratings of creativity as expressiveness and inventiveness with the sensitive eyes task. In sharp contrast to expectations, performance was positively correlated,  $r=.46$ ,  $p=.05$ , rather than negatively correlated.

## Discussion

This study suggests that creativity is one thing; those who were more expressive were also more inventive. Though I expected that people would choose one form of creativity at the expense of the other, I found the opposite. Within the task that combined both forms of creativity, those who were more expressive were also more inventive. One possible explanation is that participants did not feel compelled to

make difficult choices while making their gift. Consistent with this possibility, rather than using the full 15 minutes provided, participants typically only designed their gifts for 12 minutes (avg. 12.92min; sd. 2.11min). Given the lack of difficult choices, the sensitive-eyes task can be interpreted as additional support of the one-kind-of-creativity hypothesis. A second study is underway to replicate and extend these results with new tasks. This includes a new task to combine expressiveness and inventiveness (building a tower of marshmallows and toothpicks to display a golf ball). Pilot testing shows that this task is especially challenging; it fosters difficult choices as participants build the displays.

Clarifying when creativity is a form of expressiveness or inventiveness can help us understand the psychological processes that underlie our thinking. Otherwise we may find ourselves raising questions about one form of creativity and finding answers about another form. For example, Ruscio & Amabile (1999) examined how instruction influenced creative problem solving. In particular, participants were asked to build an "interesting" structure that stood 15 inches high. Though they intended to study inventive solutions to the problem, a factor analysis of behavioral data revealed a tendency to "decorate" as the first principal component factor. Recognizing people's choice to express themselves creatively as well as the need to find novel, inventive, solutions can help us gain insight into the nature of creativity.

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*Abstract:* Creativity is often studied as inventive fluent, flexible and divergent thinking as well as studied as a form of expressiveness with art and stories. The present study investigates whether inventiveness and expressiveness are distinct kinds of creativity or two approaches to studying the same unified construct. Twenty-two undergraduates completed three creativity tasks: inventive, expressive, and a combination of both. Inter-rater reliability of coded tasks ranged from .86 to .98. Results showed a positive correlation between inventive and expressive creativity ( $r = .49, p < .05$ ), suggesting a unitary construct. In the combined task, expressiveness and inventiveness were also positively correlated ( $r = .46, p = .05$ ), suggesting individuals may not prioritize one form of creativity over the other, but rather their underlying creativity manifests as both inventiveness and expressiveness. This study provides initial evidence creativity may be a singular construct, requiring further exploration of its complex nature in various contexts.

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