

# STUDY ON THE RELATIONSHIP BETWEEN CREATIVITY AND BOREDOM

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## Abstract

The connection between creativity and boredom has received attention from researchers, but with contradictory findings on whether boredom has a positive or negative influence on creative outcomes. To examine this issue, this study investigated how the state of boredom affects creative performance, assessing four dimensions of creativity: fluency, flexibility, originality, and elaboration. There were 25 participants, half of whom completed a boring task before completing a creativity task. The results suggested that the influence of boredom on creativity varied depending on the dimension of creativity. The study highlights the importance of specifying dimensions of creativity and suggests that taking on tedious tasks may help individuals achieve more creative performance.

**Keywords:** *Creativity, boredom, dimensions of creativity, Japan, university students.*

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## 1. Introduction

Creativity is an essential ability for working and living in the 21st century (Donovan et al., 2014). Moreover, creativity plays an important role not only in developing innovation in the workplace (Zhou & Hover, 2014) but also in making improvements in daily activities (Tanggaard, 2013). These notions confirm the importance of creativity in making something new, useful, and helpful for our social life. It is crucial to continue exploring various influential factors that influence creativity.

Since the 1950s, creativity has been studied in various fields such as psychology (Amabile et al., 2005; Guilford, 1950; Vodanovich & Watt, 2016), education (Kaufmann, 2003; Plucker et al., 2004), and management (Zhou & Hoever, 2014). Several studies reported important findings about the psychological factors of creativity, including motivation (Amabile, 1985), emotion (Gasper & Middlewood, 2014; Harris, 2000; Mann & Cadman, 2014), and environments (Amabile, 1982; Khatena, 1973). Among these factors, the present study focused on a particular emotion: boredom.

Over recent years, boredom has been much studied in the area of psychology (Chin et al., 2017). Boredom is considered a psychological and affective state related to monotonous and repetitive work (Eastwood et al., 2012; O'Hanlon, 1981), difficult tasks (Chin et al., 2017), settings without meaning (Fahlman et al., 2009), and low stimulation (O'Hanlon, 1981). People experience boredom everywhere and frequently in daily life (Bench & Lench, 2013). Typically, boredom is viewed as a hallmark of unproductivity. Indeed, boredom has been linked to a range of negative consequences (Fahlman et al., 2009). These include unsustained attention (Eastwood et al., 2012), and an increased number of mistakes (O'Hanlon, 1981)

Yet, there is a contrasting view that boredom might lead to a moment of inspiration. Even though boredom has a negative influence on mental activities, several researchers have suggested that the state of boredom may facilitate creativity (e.g., Burkus, 2014; Carroll et al., 2010; Harris, 2010). There are studies that suggested that boredom has a positive influence on creativity. The study of Mann and Cadman (2014) presented a positive relationship between the two constructs. The study assigned participants to a control group and an experimental group that experienced boredom by writing down telephone numbers. Both groups were required to do a creative task by listing as many different items as possible. The results of the study revealed a significant difference between the groups in terms of the number of writing items and an insignificant difference in terms of the quality rating of the items. Gasper and Middlewood (2014) found that participants who were induced to be bored or elated engaged in more associative thought on the association task than participants who were induced to be relaxed or distressed. It is suggested that the dimension of boredom vs. elation is important for creative performance. In contrast, the study of Haager et al. (2018) showed that boredom undermined creative performance. The study found that boredom

induced by repeated tasks can impede fluency in idea generation. With the inconsistency in empirical results, further investigation of the relationship between creativity and boredom is needed.

Based on the study of Guilford (1967), creativity can be divided into four dimensions: fluency, flexibility, originality, and elaboration. The current study examined whether there is a positive relationship between creativity and boredom with regard to the four dimensions. It is estimated that a level of higher boredom leads to a higher score on the assessment of the creativity test, and a lower level of boredom leads to a lower score. Thus, this study examined the following hypothesis:

- H1: A boredom condition leads to a greater number of responses on the creativity test than a control condition.
- H2: A boredom condition leads to more flexible responses on the creativity test than a control condition.
- H3: A boredom condition leads to more original responses on the creativity test than a control condition.
- H4: A boredom condition leads to more elaborated responses on the creativity test than a control condition.

## 2. Methods

### 2.1. Participants and sampling procedure

Initially, there were 26 participants in the main study, but one was eliminated since the instruction was erroneous. Therefore, data from 25 participants were used in the analysis. The participants in this experiment were university students in Japan, recruited from their acquaintance with the author, or from the course Biological Foundations of Mind and Behavior. Each participant was assigned to the boredom or control group with a randomization procedure.

### 2.2. Material

The boredom task was created with reference to the experiment done by Mann and Cadman (2014) and was consistent with the cognitive aspect of boredom discussed by Eastwood et al. (2012) in terms of the repetition of simple tasks. The participants in the boredom group were presented with an online document that contained a list of phone numbers and was asked to write down the number on paper for 10 minutes.

Creativity was measured by using a part of the S-A creativity test devised by Guilford (1967) to assess divergent thinking ability. The S-A creativity test asks participants to write down responses in three areas: (1) possible uses of an item; (2) desire for a particular item; and (3) possible consequences of novel circumstances that are unlikely to happen. The current study used the standardized version of this test in the Japanese language for only the third part of the S-A creativity, the consequence test, due to the concern of decreasing boredom as the creativity test continued. The consequence task (Wilson et al., 1954) was chosen because responses tend to have high rating scores (Hass & Beaty, 2018).

The content of the creativity test was shared with the participants from a laptop computer (Apple, MacBook Pro 13). The author and participants communicated online using Zoom (ver.5.8.4).

### 2.3. Procedures

An overview of the experiment was given to the participants, and they were asked to prepare their pen and paper. Participants in the experimental group then worked on the boredom task for about 10 minutes. They received a file with a list of telephone numbers via email and were asked to write down as many as they could. After completing the task, they described the degree of boredom they felt during the task on a 5-point Likert scale (1 = Not boring at all, 5 = Extremely boring).

In the next phase, participants performed the S-A creativity test. The content of the test was shared on the experimenter's computer screen. Participants were asked to write down a list of consequences in each scenario. They were instructed to produce as many consequences as possible for a given prompt. There were two questions, and participants were given 5 minutes to answer both questions. Upon finishing the creativity test, all participants were asked to take photographs of their responses and answers and to send the data to the author through e-mail.

The experiment for the control group had only the second phase. After being given the overall instruction for the experiment, participants moved directly to the S-A creativity test.

### 2.4. Evaluation of the creativity task

Four criteria were used to evaluate creativity: fluency, flexibility, originality, and elaboration. The general explanation for each criterion was introduced by the excerpt from the evaluation manual of

the official S-A creativity test. (Society for Creative Minds, 1969, as cited in Takeuchi et al., 2014). The score was determined by two raters: the author of this study and Saccess Bell, a third party. The third-party evaluation was used to obtain more reliable results and compare them with the author's analysis. The author evaluated fluency, flexibility, and originality, and the scoring agent evaluated those criteria and elaboration. The analysis was based on the general instructions for the test (Society for Creative Minds, 1969, as cited in Takeuchi et al., 2014).

## 2.5 Statistical design

The experiment was conducted in a between-participants design. The independent variable was boredom experience, and the dependent variable was creative performance. To analyze the effect of boredom on creativity, an independent *t*-test was used to investigate the mean frequency of the number of answers given as well as to examine the mean scores of flexibility, originality, and elaboration.

## 3. Results

There were 12 participants in the boredom condition and 13 in the control condition. Participant responses considered repetition or irrelevant were omitted from the analysis. Table 1 provided the overall mean, standard deviation, *t*-value, and significance for each criterion of creativity. The mean score of boredom felt during the boring task in the experimental group was 2.41.

Based on the author's evaluation, the results of the independent-samples *t*-test revealed that the difference in the number of responses between the two groups was significant:  $t(23) = 2.15, p < .05$ . Based on the scoring agent's evaluation, the *t*-test showed a marginally significant difference in the number of responses between the two groups:  $t(23) = 1.85, p < .10$ . Using data from the author's evaluation, the results demonstrated that the categories of responses between the two groups were marginally significant:  $t(23) = 1.81, p < .10$ . Using data from the scoring agent, the results revealed that the difference between the two groups was not significant:  $t(23) = 1.40, n.s.$  Based on assessments of both the author and the scoring agent, the difference in points given to rare responses was not significant between the two groups:  $t(23) = 1.30, n.s.$  for the author;  $t(23) = .78, n.s.$  for the scoring agent. According to the scoring agent's evaluation, the results of the independent-samples *t*-test illustrated that the difference in the detail of the ideas between the two groups was significant:  $t(23) = 2.37, p < .05$ . The finding demonstrated that the boredom group produced significantly more elaborate responses than the control group.

## 4. Discussion

The current study used an experimental design to examine whether a state of boredom affects creativity. The method used to induce boredom was the telephone writing task, and the person's creativity was measured with a part of the S-A creativity test asking about the consequence of a particular event. Creativity was examined in four dimensions: fluency, flexibility, originality, and elaboration.

Overall, the results indicated the partial acceptance of the hypothesis related to fluency, slight acceptance of flexibility, rejection of originality, and acceptance of elaboration. This suggested that being bored might be beneficial in increasing the fluency for the creativity test. This implied that boredom could bring more detailed responses in the creativity test. Accordingly, boredom's influence on creativity depends on the dimension of creativity. This notion indicates the need to further investigate those relationships, particularly the two creativity aspects of fluency and flexibility due to the partial or slight acceptance of the relationships. Also, it might support a premise derived from the review of literature that relationships between creativity and boredom are inconsistent. That is, some dimensions of creativity may be affected by boredom, while others may not. It will be important to specify which dimensions of creativity are investigated when a creativity study relates to boredom.

### 4.1. Comparison with the previous result

The results suggest that a boring state may enhance creativity in terms of fluency. This tendency is largely aligned with the findings of past research. In part of the study of Mann and Cadman (2014) using a creativity task, the number of answers obtained was significantly greater when a higher level of boredom was experienced. On the other hand, the current study contradicts the results of Haager et al. (2018), which demonstrated a decrease in fluency performance as more boredom was induced. Thus, the findings of this study reinforce the hypothesis that a boring state increases fluency performance. In a qualitative analysis of creativity, Mann and Cadman (2014) further noted that the originality ratings were higher after completing boring tasks. Although the present research reported a higher originality score for

boredom conditions in general, the effect was insignificant. Hence, the current research could not replicate previous findings.

With regard to flexibility and elaboration, little research has analyzed those dimensions in the context of boredom. Without the factor of boredom, flexibility was used as a criterion of creativity in studies by Iwasaki (1971) and Yamaoka and Yukawa (2016). Some studies dealt with the topic of creativity using the criteria of flexibility (Iwasaki, 1971; Yamaoka & Yukawa, 2016) and elaboration (Suryandari et al., 2021). The influence of boredom on other dimensions of creativity such as flexibility and elaboration needs to be further examined.

#### 4.2. Limitation

A major limitation of this study related to the assessment of qualitative data collected from participants. The correlation between the author's and the scoring agent's assessment was significant for fluency and flexibility but insignificant for originality. For originality, the raters used different criteria to judge the rarity of the answer. The author inferred the rarity of the answer based on the sample data acquired through this experiment. However, the scoring agent could identify based on data accumulated in the past.

#### 4.3. Implications

The current study offers both methodological and practical implications. A methodological implication, as mentioned above, is to focus on dimensions of creativity. The findings of this study were varied in terms of the effects of boredom on dimensions of creativity. Thus, it is crucial to specify which component of creativity needs to be analyzed.

The study also provides practical implications related to feelings of boredom in the workplace and education sector. The current study implied that boredom may have some benefits in itself. Embracing a sense of boredom at work or school could be worthwhile. For individuals attempting to resolve an issue or propose a creative solution, the results of the present study indicate that taking on a tedious task may help them achieve more creative performance.

Table 1. Relation of Boredom to Creativity Elements of Fluency, Flexibility, Originality, and Elaboration in the Experimental and Control Groups.

Creativity dimensions		Author			Scoring agent		
		Experimental	Control	<i>t</i>	Experimental	Control	<i>t</i>
	<i>N</i>	12	13		12	13	
Fluency	Mean	17.40	12.30	2.15*	15.08	12.31	1.85†
	<i>SD</i>	7.97	3.08		4.42	3.01	
Flexibility	Mean	10.50	8.31	1.81†	10.00	8.85	1.40
	<i>SD</i>	3.66	2.32		2.34	1.77	
Originality	Mean	3.83	2.46	1.30	3.92	3.31	0.78
	<i>SD</i>	3.07	2.18		1.98	1.93	
Elaboration	Mean				14.08	11.15	2.37*
	<i>SD</i>				3.50	2.58	

\* $p < .05$ ; † $p < .10$ .

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