

The role of instructions: The “be creative” effect not replicated

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Lab Report 3- Research Skills

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Abstract

Divergent thinking tasks are susceptible to task instructions, especially when specifically instructed to be creative. The “be creative” effect has been demonstrated by, amongst others, Nusbaum and colleagues (2014). The present study aimed to replicate their research and investigate a possible relationship between the Alternative Uses Task and creative achievement. 2 paired samples Wilcoxon rank tests assessed the effect of instructions on creative quality (uniqueness) and quantity (fluency) of the responses. The results were not significant. Further, creative achievement was not related to divergent thinking scores. However, the sample and the testing conditions bring the reliability of these results into question.

Introduction

Instructions to be creative have a positive effect on creative output (Guilford et al., 1957; Chen et al., 2005). Today, this phenomenon is coined as the “be creative” effect (BCE) and has important implications for example in the context of divergent thinking (Nusbaum et al., 2014).

Divergent thinking refers to the ability to generate many associations to a given concept. It is reasoned to be indicative of creativity (Chen, 2005). This has been assessed by counting the number of ideas generated as well as unique ideas in each sample which is called the frequentist approach. (Silvia et al., 2009).

One of the most used divergent thinking tasks is the Alternative Uses Task (AUT; (Nusbaum et al., 2014). The test gives a verbal or visual prompt, for example a box or rope, and participants are asked to generate as many alternative uses for the object as possible within a limited timeframe (Chen et al., 2005).

A study by Nusbaum and colleagues (2014), for example, used the AUT to examine the BCE and its relation to fluid intelligence. Participants were given 2 divergent thinking tasks, one with the instruction to “be creative” and the other asking to write down as many alternatives as possible (“be fluent”). They observed that the “be creative” condition yielded fewer but more creative responses. This shift toward quality contrasted the fluent condition, where responses were higher in quantity.

An alternative measure to predict scores on the AUT and gain new insight into individual differences is the Creative Achievement Questionnaire (CAQ). It is a self-report measure designed to quantify successful creative engagement and output with 10 artistic and scientific domains across a person’s lifetime (Carson et al., 2005).

The present study aims to replicate Nusbaum et al.’s study (2014) asking whether asking people to be creative affects the quantity of their responses. (Nusbaum et al., 2014, p.3). Further, the study explored the CAQ as a predictor of AUT scores. To assess the AUTs susceptibility to the BCE, in line with Nusbaum’s findings, it was hypothesized that uniqueness scores (US) and fluency scores (FS) in the “be creative” condition are quantitatively lower than in the “be fluent” condition. Further, it was hypothesized that creative achievement is positively correlated with US and FS.

Methods

Design. A 2x2 mixed methods design investigated the BCE and individual differences in creative achievement. The within-subjects manipulation was the task instruction (“be creative” or “be fluent”). The between-subjects manipulations were the counterbalanced order of the instructions (“be creative”: first or second) and the counterbalanced order of the prompts (box first or rope first), which served as a control. Participants were randomly assigned to either one of the 4 between-subjects conditions.

Materials. Demographic data included age and gender. The AUT was used to evaluate divergent thinking. Participants were asked to write down as many alternative uses for each one of 2 objects, “box” and “rope”, presented as verbal prompts. “Be fluent” were to produce as many alternatives as possible. “Be creative” instructions were to produce creative uses that strike people as “clever, unusual, interesting, uncommon, humorous, innovative, or different”.

For the CAQ, participants needed to place a checkmark next to domains that they believed to have above average talent in. Further, participants mark items that best describe their achievement in each domain.

Procedure and participants. Participants were asked to complete the online study in their own time and had 2 weeks to do so. Participants had three minutes each to type out the responses into a box on the screen for 2 blocks of the AUT. Instructions were presented prior to and during each trial. Subsequently participants were asked to fill out the CAQ questionnaire. The sample consisted of 30 students from a postgraduate program at Goldsmiths University, class of 2022 and 2023.

Results

The data was analyzed with *jamovi*, a r-based, open-source statistical package. 3 participants were excluded from the analysis because of missing data. The remaining 27 participants had a mean age of 28 years ($SD = 6.6$) and 75% were female. FS were obtained by counting the overall number of ideas written in either condition. US were obtained by subjective scoring by the experimenter by filtering out any items overlapping semantically or conceptually. The resulting 4 scores by distinguished uniqueness and fluency by response task 1 and 2. The data was restructured to distinguish uniqueness and fluency by instructions. Descriptive information of the restructured scores is displayed in Table 1 and visualized in

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Figure 1 below. Significant Shapiro-Wilk tests for all variables indicated non-normal distributions. As such, further analysis used non-parametric tests.

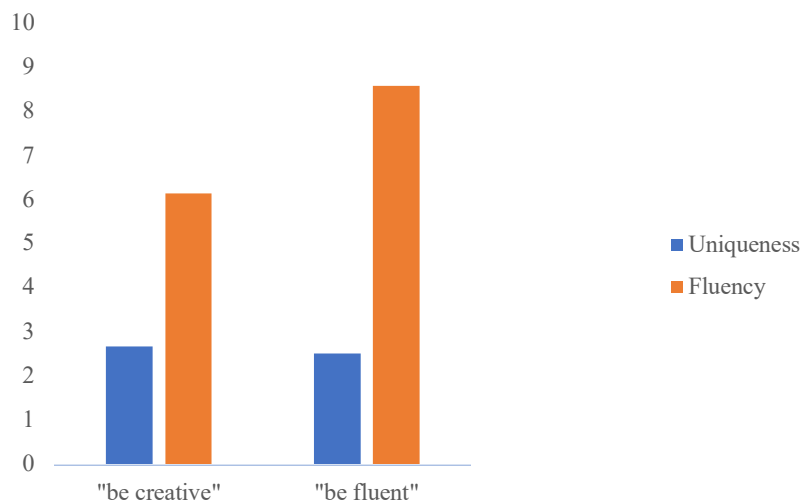
Table 1

Descriptives

	Be Creative (Uniqueness)	Be Creative (Fluency)	Be Fluent (Uniqueness)	Be Fluent (Fluency)
N	27	27	27	27
Mean	2.67	6.15	2.52	8.59
Standard deviation	2.11	4.30	1.70	4.77
Minimum	0	0	0	3
Maximum	7	20	7	19
Shapiro-Wilk W	0.86	0.86	0.84	0.79
Shapiro-Wilk p	0.002	0.002	< .001	< .001

Figure 1

Scores by Instruction



To investigate possible effects of task order on uniqueness and FS a one-way ANOVA was conducted. Kruskal-Wallis tests confirmed that neither US ($\chi^2(1) = 0.1, p = 0.75, \epsilon^2 = 0$) nor FS ($\chi^2(1) = 0.36, p = 0.6, \epsilon^2 = 0.14$) were affected by order.

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A non-parametric one-tailed paired samples Wilcoxon rank test assessed the BCE for US and FS. US did not significantly differ across instructions ($W = 113, p = 0.472, rrb = -0.02$) contrasting to FS ($W = 40.5, p = 0.01, rrb = -0.57$). Hence, there was no BCE present in the sample for US but there was an effect for FS. When instructed to note down as many ideas as possible, FS were significantly higher than when instructed to be creative. Post hoc calculated power for US and FS yielded 0.17 and 0.88, respectively.

Lastly, it was investigated whether creative achievement was a predictor of AUT scores. Overall CAQ scores were correlated with summed US as well as FS which did not show any significant correlations. A correlation matrix using Spearman's r further investigated possible correlations of single domains (i.e., only creative writing) with either US or FS which also did not reveal any significant results. Hence, CAQ neither predicted uniqueness nor FS on the divergent thinking task. In this sample lifelong creative achievement was not a predictor of performance on divergent thinking tasks.

Discussion

The “be creative” effect of instructions on divergent thinking tasks have been demonstrated to play a crucial role regarding US. The present study aimed to replicate the finding by Nusbaum et al.'s (2014) research. The results did not show a BCE for US but did for FS. The AUT and the CAQ did not show any significant correlations. Possible explanations for these results are multi-faced and run along the line of limitations of the AUT and its combination with the CAQ.

As the US are tied to its sample population, an increased sample size makes it harder for unique answers to occur (Silvia et al, 2009). As such it is well suited for the present sample size (27). However, the sample it came from students who study in the same program and are thus exposed to the same information which might have biased US.

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It is important to note that the uniqueness of a response does not capture its creativeness and even less the creativity as a trait on a person. It is a measure of divergent thinking which does not equate to creativity (Giancola et al., 2022).

Notably, the test was conducted in an uncontrolled yet ecologically invalid setting, asking participants to be creative or fluent on the spot with no further indication of the participants current state or possible neurodiversity. For all we know, all the participants could have had a concussion while answering the questionnaires. This is problematic for a reliable interpretation of the results. Thus, the BCE should not be dismissed, but rather future research could investigate above and beyond the sample of psychology students.

Lastly, creative achievement is a conglomerate of inter- and intrapersonal factors, such as cognitive abilities, personality, societal factors, financial resources, and culture, that play out over a lifetime (Carson et al., 2005). Divergent thinking is a single factor in the complex construct that is creativity. Creative output and achievement are recognized to arise from the interplay of convergent and divergent thinking (Giancola et al., 2022). The lack of overlap between the AUT and CAQ may hence be because the design did not include a measure of convergent thinking.

In sum the results did not replicate the findings of Nusbaum and colleagues and are neither valid for interpretation nor generalization.

References

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