Examining the Relationship Between Creative Thinking and Specific Types of L2 Speaking Performance

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1. Introduction

Many L2 learners in Japan struggle with speaking, prompting researchers to investigate factors that enhance both the quality and quantity of speech. Previous studies have revealed relationships between creativity and language production in terms of a tendency to use spoken logical connectives more frequently, as well as higher levels of teacher-reported qualitative observations of narrative task engagement in exploratory research from school settings. However, there is a need to further specify the precise variable relations between creative task performance and speaking skills indicated by discourse markers and the number of words produced. Therefore, this study aims to clarify the relationship between divergent and convergent thinking and L2 speaking performance by evaluating word utterances and hesitations during the speaking process. This study addresses the following research questions:

RQ1: How robust are the relative effects of divergent thinking and convergent thinking on speaking tasks with different characteristics?

RQ2: What kind of difference can be observed between participants who major in English language education and those who do not?

2. Methodology

Twenty university students majoring in English language education and 37 university students from non-English language education majors participated in creativity and speaking tasks. Both groups were asked to answer a demographic questionnaire. English education majors answered a short interview about their language background on their contact, confidence, and frequency of English use. Once the interview was finished, participants conducted two tasks designed to measure L2 speaking performance, and two tasks to measure creativity. A picture narrative task and an argumentative speech task excerpted from the Eiken Grade 2 was used to judge their English proficiency. In the argumentative speech task, participants were asked to express their opinion in response to two questions. Each task took approximately 2 to 3 minutes for the participants to perform. All tasks for the English language education majors were conducted in person, whereas those for the non-English language education majors were administered via computer screen due to time constraints.

Operational definitions of creativity stipulate its component processes in terms of divergent thinking and convergent thinking. Divergent thinking is the ability to produce different ideas flexibly in response to a given problem. Divergent thinking also consists of fluency (number of ideas), flexibility (variety of ideas), originality (rarity of ideas), and elaboration (detailed ideas). Convergent thinking is the ability to specify an appropriate solution to a given problem by choosing from different ideas. The Alternative Uses Task (AUT) was used for measuring divergent thinking and Remote Associates Task (RAT) was used for measuring convergent thinking.

In the AUT, participants were asked to generate as many unconventional uses as possible for a common object (e.g., box, rope, brick, pen, newspaper, towel). Stimuli were randomly assigned via numbered paper sheets to ensure experimenter blinding, and objects were presented through PowerPoint slides. Participants provided verbal responses in Japanese without preparation time, and a one-minute break was given between each object. Performance was assessed based on fluency (number of uses) and originality (rarity of responses).

The RAT required participants to identify a single word—presented as a Japanese kanji that semantically links three given kanji cues (e.g., a Japanese equivalent of the English example: CREAM, SKATE, WATER → ICE). The task included 79 items divided into blocks of 20, with one-minute breaks in between to reduce fatigue. The session lasted approximately 25 minutes. Participants wrote their responses on paper, skipping

items if no solution could be generated. Responses were manually coded and scored for each participant.

3. Results

3.1. Descriptive Statistics and Correlations (RQ1)

To address the research questions about the relationship between creativity variables and other study variables, this study conducted a Pearson's partial correlation analysis. As indicated in Table 1, DT (divergent thinking) and CT (convergent thinking) had a weak negative correlation. This result was unexpected since many studies (Erwin et al., 2022; Guilford, 1967; Olteţeanu et al., 2020; Suzuki, 2022; Terai et al., 2013) showed that DT and CT correlate with each other. However, the numerical data in this study shows the opposite result. Average hesitation was negatively correlated with DT. This suggests that participants capable of processing divergent thinking may have a reduced likelihood of making pauses and repairs while speaking compared to participants capable of processing convergent thinking. The most noteworthy result to emerge from the data is that DT had a moderate correlation with the words produced during the picture narrative task. The results of the descriptive statistics and correlations are provided in Table 1 below.

Table 1.

Descriptive Statistics and Pearson's Partial Correlations for the Study Variables

	M	*SD*	1	2	3	4	5	6
1. DT (AUT)	15.30	4.97	—					
2. CT (RAT)	43.95	6.00	-.15	—				
3. Average Hesitation	5.70	3.19	-.24	.28	—			
4. Picture Narrative Words Produced	70.40	21.93	.52*	.28	.14	—		
5. Argumentative Task 1 Words Produced	52.15	21.80	.42	.39	.22	.76**	—	
6. Argumentative Task 2 Words Produced	51.35	23.91	.21	.46	.46	.62*	.77***	—

Note. Conditioned on age, gender, and total TOEIC score. *M* = mean, *SD* = standard deviation. DT and CT refer to divergent thinking and convergent thinking, respectively. Hesitation was calculated by subtracting pauses and repairs from the words produced in each task. Two participants did not report their TOEIC scores ($n = 18$; $M = 797.50$, $SD = 67.70$). Average hesitation refers to the number of pauses and repairs for each speaking task. * $p < .05$, ** $p < .01$, *** $p < .001$

3.2. Comparison of AUT Scores Between English Language Education Majors and Non-English Language Education Majors (RQ2)

Thirty-seven participants who do not major in language education answered the AUT via typing in the creative uses on the computer screen. Each participant was allocated with a prompt either "bottle" or "hanger". Thirty-six responses were collected, and the results are shown below (Table 2). This analysis is also an assumption check to clarify the robustness of the prompts by showing the descriptive statistics. Table 2 indicates that the prompt "bottle" elicited more responses compared to "hanger" with a higher SD. This suggests that "bottle" can be used as a prompt for capturing divergent thinking supported by statistical evidence for further studies.

The most notable finding is the mean difference in AUT performance between English language education (ELE) majors and the comparison group (bottle/hanger group). As shown in Table 2, ELE majors produced a significantly higher average number of uses. This difference may be attributed to the mode of response in the AUT task. In the first experiment (n=20), participants responded orally, which likely reduced cognitive load compared to typing responses manually. Oral production may therefore be a more effective method for capturing divergent thinking.

Additionally, language aptitude might influence creative performance, particularly divergent thinking. Participants majoring in English language education generated more responses on average than non-majors,

suggesting that greater language proficiency or comfort with language usage could facilitate creative ideation. In sum, the results in Table 2 suggest that divergent thinking is more effectively elicited through spontaneous oral responses, and that language ability may play a role in shaping creative output.

Table 2.

Descriptive statistics of AUT Number of Uses

	Group	*n*	*M*	*SD*
AUT Number of Uses	ELE Majors	20	15.30	4.97
	Bottle	18	5.67	2.11
	Hanger	18	4.44	1.20

Note. *M* = mean, *SD* = standard deviation, *ELE* = English Language Education. Non-ELE majors were allocated with a prompt either "Bottle" or "Hanger".

4. Discussion and Conclusion

The numerical values for the AUT were comparable to previous studies (Harada, 2021; Suzuki, 2022). Similarly, RAT results corresponded to prior findings by Harada (2021), but not Suzuki et. al. (2022). Adjusting for age, gender, and total TOEIC scores as an indicator of proficiency, a statistically significant positive correlation for AUT and number of words produced was observed (R=.52, p=.047). Contrary to expectation, these preliminary findings did not observe an association between creativity measures and the total words produced on the argumentative task in two forms nor via hesitation averaged across task types. This suggests that the picture narrative task is relatively unstructured in terms of the way of answering compared to argumentative tasks. In other words, describing and explaining each scene stimulates speakers to think out of the box. For argumentative tasks, participants tend to answer in a certain form (e.g. Opinion-reason-example-opinion style). Overall, the different patterns of variance and group characteristics across task type observed in this study suggest that creative thinking prompts provide the context for open and diverse responses that could be overlooked when target language is the sole focus of assessment. Since many classes include communicative activities in modern English lessons, speaking skills may be evaluated without considering crucial variables that affect the performance. Therefore, teachers and educators must be aware of how creativity emerges through each task and carefully consider when and how to use the tasks in class.

5. Acknowledgement

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6. References

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