

The Influence of Anxiety and Task Complexity on the Oral Performance of Chinese EFL Learners

Lu Cai^{1*}

¹ School of Foreign Studies, Nanjing University of Science and Technology, Nanjing, China

Email Address

lucai@njust.edu.cn (Lu Cai)

*Correspondence: lucai@njust.edu.cn

Received: 2 May 2025; **Accepted:** 25 May 2025; **Published:** 26 June 2025

Abstract:

Foreign language anxiety (FLA) is widely recognized as a key affective factor influencing second language (L2) learning, particularly in speaking tasks where learners often experience stress and fear of negative evaluation. While previous studies have explored the general effects of FLA in classroom settings, limited research has examined how task complexity interacts with speaking anxiety to affect L2 oral performance. Building on this gap, the present study investigates the relationship between task complexity, speaking anxiety, and specific dimensions of oral performance—including fluency, lexical complexity, and syntactic complexity—among Chinese learners of English as a Foreign Language (EFL). Thirty-four Chinese university students completed a self-rating scale and participated in two oral narrative tasks with differing levels of cognitive reasoning demand. Results revealed that more complex tasks elicited significantly higher anxiety levels than simpler ones, indicating that task complexity is a meaningful predictor of L2 speaking anxiety. However, no statistically significant correlation was found between anxiety levels and oral performance measures. This suggests that although learners may feel more anxious during complex tasks, their speech fluency and complexity are not necessarily impaired. These findings provide empirical support for integrating task complexity into L2 instruction and highlight the need for further research with larger, more diverse samples and longitudinal approaches.

Keywords:

Language Anxiety, Task Complexity, Speaking Performance

1. Introduction

Language anxiety is one of the most extensively studied affective variables in both L2 and foreign language acquisition research [3]. Much of the existing research on FLA has focused on situational state anxiety that arises in classroom settings [9], such as anxiety triggered by language performance, fear of negative evaluation, or communication apprehension.

Task difficulty, moderated by learners' L2 proficiency level, is known to trigger anxiety effects on speech processing and output production [14]. Kim and Payant [10] employed a pre-test/post-test design to investigate how engaging in tasks with different degrees of complexity impact L2 oral performance development. Their findings suggested that complex tasks promoted greater syntactic complexity and fluency over time.

However, few studies have specifically examined how reasoning demands within tasks contribute to speaking anxiety or how such anxiety, in turn, affects different dimensions of L2 oral performance. To address this gap, the present study explores the relationship among speaking anxiety, task complexity, and the oral performance of Chinese learners of English as a Foreign Language (EFL). To address the aims of this study, the following research questions are proposed:

- (1) To what extent does task complexity influence the speaking anxiety of Chinese EFL learners?
- (2) In what ways does task complexity affect the oral performance of Chinese EFL learners, particularly in terms of fluency, lexical complexity, and syntactic complexity?

2. Literature Review

2.1. Anxiety and Task Complexity

Task complexity, which is often shaped by learners' L2 proficiency in their second language, has been identified as a factor that may lead to anxiety during speech processing and oral production [14]. However, there is limited research on the effects of task complexity on speaking anxiety, particularly in relation to learners' second language proficiency, and the findings thus far have been inconclusive. For instance, Kim et al. [11] observed that low-anxiety learners outperformed high-anxiety learners across tasks with varying cognitive complexity, but task complexity itself did not significantly impact learners' anxiety levels. In contrast, Révész [17] found no significant correlation between anxiety measure and measures of complexity and accuracy in speech production, regardless of task complexity levels. Conversely, Robinson [18] reported that learners with higher levels of output anxiety produced speech with lower syntactic complexity compared to those with lower anxiety levels.

2.2. Anxiety and Oral Production

FLA as a construct in second language acquisition, is considered a form of state anxiety that subsumes various negative emotions learners experience in L2 classrooms. It involves feelings related to certain language-learning tasks, but also develops over time due to repeated exposure to anxiety-inducing situations linked to L2 classrooms [13], such as communicating in the target language, fear of negative evaluation during performance, and formal language testing [8, 9]. This is a situational type of state anxiety uniquely associated with L2 learning that has been shown to be independent from anxiety as an individual trait [4, 8, 12], although learners with high trait anxiety are more likely to experience heightened state anxiety when using their L2 [13].

The present study focuses on L2 speaking anxiety, a subtype of FLA learners experienced during oral communication, whether in classroom-based tasks or in real world interactions [21]. In the context of this research, L2 speaking anxiety is further categorized as a form of task complexity, indicating anxiety that arises in response to

features of task design such as difficulty and cognitive complexity [2]. Research has consistently shown that anxiety hinders language learning, with recent meta-analytic evidence suggesting it accounts for approximately 13% of the variance in L2 learning outcomes [19].

3. Methods

3.1. Participants

The study recruits 24 native Chinese speakers (5 males and 19 females) from Nanjing University of Science and Technology. All participants had passed the College English Test Band 6 (CET-6), indicating an upper-intermediate level of English proficiency. Prior to data collection, written informed consent was obtained from all participants. None of the participants reported any hearing impairments or speech-related pathologies.

3.2. Instruments

The instruments used in this study included the Chinese version of the Language Background Questionnaire, a Self-Rating Scale, and two versions (simple and complex) of a story-retelling task.

The Language Background Questionnaire was designed to collect basic demographic and linguistic information about the participants. The Self-Rating Scale was a 9-point Likert-type questionnaire consisting of three statements aimed at assessing participants' perceptions of task difficulty, mental effort, and stress levels.

To elicit oral performance data, two versions of the fire-chief task [7] were administered using picture prompts. In both scenarios, participants were asked to assume the role of a fire chief managing an emergency in which a building was on fire and several individuals required rescue. In the simple task, the people in the building had no specific roles, and participants had ample resources (e.g., three fire trucks and a helicopter that could be used simultaneously) with few complicating factors (e.g., people in safe zones, static fire, smoke blowing away from the building). In the complex task, participants had to make decisions involving individuals with special needs (e.g., an elderly person or a severely injured individual), thereby increasing the cognitive demands of the task.

These tasks were selected for their ability to elicit spontaneous, unprepared speech samples suitable for analyzing various dimensions of speaking performance, while also inducing inter-learner variability in speaking anxiety. The two task versions varied systematically in terms of cognitive demands, aligned with resource-directing variables. The fire-chief task has been widely employed in prior L2 oral [6, 7] and writing research [20], and its design has been empirically validated for differentiating levels of cognitive complexity [5].

3.3. Procedure

Participants were informed of the general purpose and procedures of the study, as well as their right to decline participation or withdraw specific tasks at any time. The informed consent forms and questionnaires were distributed via Wen'juanxing, an online survey platform. The experiment was conducted in a quiet meeting room at the School of Foreign Studies, Nanjing University of Science and Technology.

The procedure began with participants signing the informed consent form and completing the Language Background Questionnaire. They then performed both the simple and complex versions of the fire-chief task in a counterbalanced order to control for order effects. For each task, participants were given 30 seconds to read the instructions and examine the picture before beginning their oral response. All oral performances were recorded using a laptop computer. Immediately after completing each task, participants completed the Self-Rating Scale to assess their perceived task difficulty, mental effort, and anxiety. All speech recordings were transcribed as soon as possible following data collection to ensure accuracy and completeness for subsequent analysis.

3.4. Data Analysis

The spoken data collected were analyzed with respect to fluency and complexity. Fluency was operationalized as the average number of words produced per minute. Syntactic complexity was assessed using the number of clauses per T-unit, while lexical complexity was measured using the type-token ratio.

All statistical analyses were conducted in R [16]. Given that the data did not meet the assumption of normality, the relationship between task complexity and anxiety was examined using the Wilcoxon signed-rank test, a non-parametric alternative. The effects of task complexity on oral performance measures were analyzed using Pearson correlation tests, as the relevant variables met the criteria for parametric testing.

4. Results

The overall findings suggest that participants experienced higher levels of anxiety during the complex task compared to the simple task (Table 1). Additionally, task complexity appeared to influence learners' oral English performance, including measures of fluency, syntactic complexity, and lexical complexity.

Table 1. Means (*M*) and standard deviations (*SD*) of speech measures in the simple and the complex tasks.

		Simple Task		Complex Task	
		M	SD	M	SD
Anxiety	Tak difficulty	5.33	1.27	6.46	1.06
	Mental effort	5.12	1.4	6.63	1.09
	Stress level	5.04	1.16	7	1.29
Fluency	Fluency level	1.3	0.26	1.23	0.32
Complexity	CT	1.62	0.55	2.3	0.97
	TTR	0.42	0.07	0.46	0.09

Abbreviations: CT = clauses per unit; TTR = type-token ratio.

Table 2. Wilcoxon tests of speaking anxiety in the simple and complex tasks.

	N	Mean	SD	Wilcoxon test
Simple Task Anxiety	24	15.71	3.18	$p = 0.011$
Complex Task Anxiety	24	20.08	2.89	

Abbreviations: N = number of participants; SD = standard deviations.

4.1. Task Complexity and Speaking Anxiety

To address the first research question, the effects of task complexity on speaking anxiety were examined using the Wilcoxon signed-rank test. Descriptive statistics show that participants reported a lower level of anxiety during the simple task ($M =$

15.71) compared to the complex task ($M = 20.08$). The Wilcoxon test revealed a statistically significant difference between the two conditions ($p = 0.011$), indicating that task complexity significantly impacts learners' anxiety levels. (Table 2)

4.2. Speaking Anxiety and L2 Oral Production

To address the second research question, the study examined the relationship between anxiety levels and L2 oral performance across both simple and complex tasks. Figure 1 displays the correlation between anxiety and syntactic complexity (measured by clauses per T-unit). Pearson correlation tests indicated no significant relationship in either task condition (Simple: $r = -0.053$, $t(22) = -0.250$, $p = 0.8053$; Complex: $r = 0.108$, $t(22) = 0.507$, $p = 0.617$).

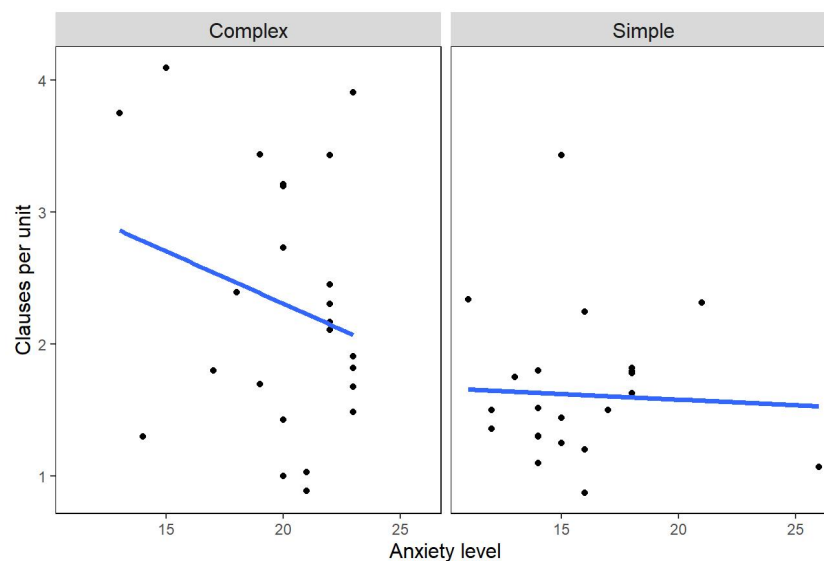


Figure 1. Correlations between anxiety level and the number of clauses per unit in simple and complex tasks.

Figure 2 shows the correlation between anxiety and lexical complexity (measured by type-token ratio). Pearson correlation tests revealed no significant correlation between anxiety and type-token ratio in either task (Simple: $r = -0.008$, $t(22) = -0.037$, $p = 0.971$; Complex: $r = 0.075$, $t(22) = -0.354$, $p = 0.7266$).

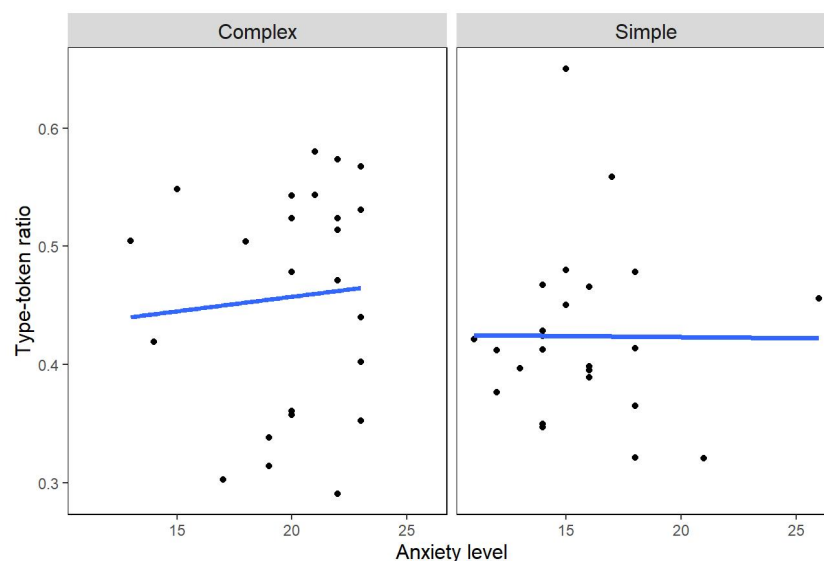


Figure 2. Correlations between anxiety level and the type-token ratio data in simple and complex tasks.

Figure 3 illustrates the correlation between anxiety and fluency. Pearson tests showed no significant correlation between anxiety and fluency in either task (Simple: $r = -0.053$, $t(22) = -0.250$, $p = 0.8053$; Complex: $r = 0.108$, $t(22) = 0.507$, $p = 0.617$).

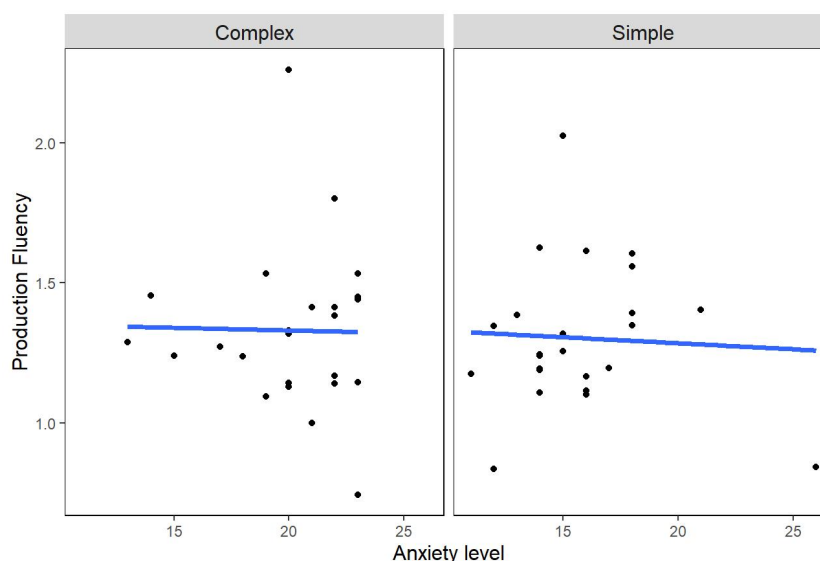


Figure 3. Correlations between anxiety level and production fluency in simple and complex tasks.

In summary, while task complexity was found to significantly affect learners' anxiety levels, no statistically significant associations were observed between anxiety and the measured dimensions of L2 oral performance (fluency, lexical complexity, and syntactic complexity) in either task condition.

5. Discussion

The current study investigated whether task complexity affects speaking anxiety in L2 learners as they performed an oral narrative task and examined how both task complexity and speaking anxiety relate to specific dimensions of L2 speech production, namely fluency and complexity.

The findings indicate that task complexity is significantly associated with L2 speaking anxiety. Participants reported lower levels of anxiety in simple tasks compared to complex ones. This result aligns with Mora's [15] findings, which demonstrated that increased task complexity heightens learners' anxiety. Similarly, Cho [1] found that task complexity and modality both played important roles in shaping task performance, with more complex tasks resulting in greater syntactic complexity.

In addition, the study explored the relationship between anxiety and learners' oral performance. The results revealed no significant correlation between anxiety levels and measures of syntactic or lexical complexity. This outcome contrasts with the findings of Kim and Payant [10], who reported that engaging in complex tasks over time enhanced syntactic complexity and fluency in L2 speech. One possible explanation for this discrepancy is that participants in the current study may have engaged in prior rehearsal, which could have mitigated the negative effects of task-induced anxiety. This interpretation is consistent with Cho's [1] findings, which suggested that fluency was not significantly affected by task complexity.

6. Conclusions

This study set out to examine the relationship among speaking anxiety, task complexity, and second language (L2) oral performance among Chinese EFL learners. The findings provide evidence that task complexity significantly influences learners' perceived anxiety levels, with more cognitively demanding tasks eliciting greater anxiety. However, despite the increase in anxiety under complex task conditions, no significant correlation was observed between anxiety levels and oral performance in terms of fluency, lexical complexity, or syntactic complexity. These results suggest that while task complexity affects learners' emotional responses, such anxiety may not necessarily translate into measurable differences in spoken language performance—at least not within the scope of the current tasks or under short-term observation.

Several limitations should be acknowledged. First, the sample size was relatively small and may limit the generalizability of the findings. Second, participant selection criteria were broad, which may have introduced variability in language proficiency or learning background. Third, only two task types were employed, potentially limiting the range of cognitive demands assessed.

Despite these constraints, the present study offers empirical support for the role of task complexity in shaping L2 learners' affective responses and highlights its potential relevance for task design in language pedagogy. Future research could expand on these findings by incorporating a wider range of task types, larger and more diverse samples, and longitudinal designs to further explore the dynamic relationship between anxiety and oral performance over time.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

References

- [1] Cho, M. Task complexity, modality, and working memory in L2 task performance. *System*, 2018, 72, 85-98.
- [2] Donate, Á. Task anxiety, cognition and performance on oral tasks in L2 Spanish. *Journal of Spanish Language Teaching*, 2022, 9(1), 1-18.
- [3] Dörnyei, Z.; Ushioda, E. Teaching and researching motivation, 2013. Routledge.
- [4] Ehrman, M.E.; Leaver, B.L.; Oxford, R.L. A brief overview of individual differences in second language learning. *System*, 2003, 31(3), 313-330.
- [5] Gilabert, R. Effects of manipulating task complexity on self-repairs during L2 oral production. *International Review of Applied Linguistics in Language Teaching*, 2007, 45(3), 215-240.
- [6] Gilabert, R.; Barón, J.; Levkina, M. Manipulating task complexity across task types and modes. In P. Robinson (Ed.), *Second language task complexity*:

- Researching the cognition hypothesis of language learning and performance, 2011; pp. 105–140; John Benjamins.
- [7] Gilabert, R.; Barón, J.; Llanes, À. Manipulating cognitive complexity across task types and its impact on learners' interaction during oral performance. *International Review of Applied Linguistics in Language Teaching*, 2009, 47(3-4), 367-395.
- [8] Horwitz, E.K. On the misreading of Horwitz, Horwitz, and Cope (1986) and the need to balance anxiety research and the experiences of anxious language learners. *New insights into language anxiety: Theory, research and educational implications*, 2017, 31, 47.
- [9] Horwitz, E.K.; Horwitz, M.B.; Cope, J. Foreign language classroom anxiety. *The Modern Language Journal*, 1986, 70(2), 125-132.
- [10] Kim, Y.; Payant, C. Impacts of task complexity on the development of L2 oral performance over time. *International Review of Applied Linguistics in Language Teaching*, 2017, 55(2), 197-220.
- [11] Kim, Y.; Tracy-Ventura, N.; Robinson, P. Task complexity, language anxiety, and the development of the simple past. *Second Language Task Complexity*, 2011, 148.
- [12] MacIntyre, P.D. An overview of language anxiety research and trends in its development. *New insights into language anxiety: Theory, research and educational implications*, 2017, 11-30.
- [13] MacIntyre, P.D.; Gardner, R.C. Anxiety and second-language learning: Toward a theoretical clarification. *Language learning*, 1989, 39(2), 251-275.
- [14] MacIntyre, P.D.; Gardner, R.C. The subtle effects of language anxiety on cognitive processing in the second language. *Language Learning*, 1994, 44(2), 283–305.
- [15] Mora, J.C.; Mora-Plaza, I.; Bermejo Miranda, G. Speaking anxiety and task complexity effects on second language speech. *International Journal of Applied Linguistics*, 2024, 34(1), 292-315.
- [16] R Core Team, R. R: A language and environment for statistical computing. R foundation for statistical computing, Vienna, Austria, 2013; 3-900051-07-0.
- [17] Révész, A. Task complexity, focus on L2 constructions, and individual differences: A classroom-based study. *The Modern Language Journal*, 2011, 95, 162-181.
- [18] Robinson, P. Criteria for classifying and sequencing pedagogic tasks. *Investigating tasks in formal language learning*, 2007, 7, 26.
- [19] Teimouri, Y.; Goetze, J.; Plonsky, L. Second language anxiety and achievement: A meta-analysis. *Studies in Second Language Acquisition*, 2019, 41(2), 363-387.
- [20] Vasylets, O.; Gilabert, R.; Manchón, R.M. The effects of mode and task complexity on second language production. *Language Learning*, 2017, 67(2), 394-430.
- [21] Woodrow, L. Anxiety and speaking English as a second language. *RELJ journal*, 2006, 37(3), 308-328.



© 2025 by the author(s); licensee International Technology and Science Publications (ITS), this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (<http://creativecommons.org/licenses/by/4.0/>)