The Relationship between Task Complexity, Task Difficulty, and Speaking Performance: The Case of Chinese EFL Learners

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Abstract
In recent years, task-based language teaching (TBLT) has become a prevalent pedagogy in Chinese universities. Much research has focused on task complexity. Nevertheless, task difficulty, another crucial element of TBLT, has gained little attention from researchers. With twenty Chinese first-year undergraduates majoring in English participating in the present research, this study explored the relationship between task complexity, difficulty, and Chinese EFL learners' English speaking performance, hoping to shed light on the design and implementation of tasks in L2 teaching. The results suggested that learners' grammatical complexity, lexical sophistication, and accuracy varied significantly in the two tasks of different complexity. Only speaking speed was found to be positively correlated with task difficulty. When learners' confidence to fulfill a task was bolstered, they would respond to the task at a faster speaking speed. Hence, teachers can design tasks of different complexity flexibly and fine-tune the complexity of the tasks to meet different teaching goals. Teachers can also strengthen the students' confidence in accomplishing tasks to enhance their speaking fluency.
Keywords: Chinese EFL learners, task-based language teaching, task difficulty, task complexity, linguistic complexity, accuracy, fluency
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1. Research Rationale
Research concerning language teaching in recent years has gained momentum in task-based language teaching (TBLT), in which the task is the core element in the whole teaching process. The design and implementation of tasks, therefore, have received much attention. Task performance has been also regarded as a crucial issue in research concerning TBLT. According to Robinson's (2001) Cognitive Hypothesis, three factors are associated with task performance, *i.e.,* task complexity, task condition, and task difficulty. Among these factors, task complexity and task condition have been studied by several researchers (Bui, 2019; Bui & Skehan, 2018; Bulté & Housen, 2012; Robinson, 2001; 2007; 2015; Skehan, 1998; 2003; 2009). Nonetheless, little research has placed significance on task difficulty. Since TBLT is a meaning-focused and learner-centered pedagogy compared with traditional approaches, task difficulty is directly linked to learners' self-efficacy to accomplish the task, and task complexity to a large extent determines whether they can fulfill the task (Revesz *et al.*, 2016). Hence, this research explored the relationship between task complexity, task difficulty, and Chinese EFL learners' English speaking performance in linguistic complexity, accuracy as well as fluency. Hopefully, the results of the current study can provide some implications for how to implement TBLT in EFL classrooms.

2. Literature Review
2.1 Task Complexity
Currently, there exist two major hypotheses concerning task complexity: One is Skehan's (1998, 2009) Trade-off Hypothesis and the other is Robinson's (2001; 2007; 2015) Cognition Hypothesis.

Skehan's Trade-off hypothesis claims that L2 learners' attention capacity is limited so that learners cannot allocate their attention to accuracy and complexity simultaneously. They can only successfully focus on either accuracy or complexity unless task intervention is provided (Skehan, 1998; Robinson, 2015; Bui & Skehan, 2018).

As opposed to the Trade-off Hypothesis, Robinson's Cognition Hypothesis argues that learners' linguistic accuracy and complexity can be increased by a complex task at the same time while fluency cannot. Another significant argument of this hypothesis is that tasks should be designed and sequenced with an increase of complexity according to two dimensions of task complexity: resource-directing and resource-dispersing. Variables of resource-directing dimensions direct learners' attention to the language form that is used to express contents. The main variables of such dimensions include intentional reasoning and the number of elements of the task. Variables of resource-dispersing dimensions mainly include planning time and prior knowledge. These two dimensions can be considered as the variables to manipulate task complexity. Therefore, the two tasks implemented in the present research will be different in terms of these two dimensions so that the tasks can be different in complexity.

2.2 Task Difficulty

Task complexity, as is mentioned above, is task-centered and concentrates on manipulable cognitive demands of tasks such as planning time, prior knowledge, the number of elements, and intentional reasoning. Task difficulty, nevertheless, is learner-centered and highlights learner factors. Robinson (2011) argues that learners depend on a certain extent of resources while performing tasks, such as available attention, memory, and reasoning. These resources are highly relevant to learner factors.

Learner factors, from Robinson's perspective, are comprised of two kinds: affective variables and ability variables. Affective variables, such as confidence, motivation, and stress, may affect or change learners' resources temporarily when they engage in the task, while ability variables such as intelligence, aptitude, and cognitive style are more stable, and they are not subject to the task. In other words, ability variables can be assessed any time before or after the task while the affective variables can only be evaluated during the process of the task. To be specific, learners cannot evaluate or respond to a task before they are informed of any information about the task, which means that they do not form perceptions of task difficulty until they know something about the task. Accordingly, task difficulty is temporary because it can be only perceived by learners when they are involved in the task.

To evaluate task difficulty, Robinson (2001) devised a brief nice-point scale encompassing questions about learners' confidence, motivation, interest, stress, and perception of task difficulty. Robinson (2007) later utilized this scale to measure the task difficulty. After analyzing 42 learners' answers to the questionnaire, Robinson discovered that learners were less confident and motivated to accomplish a more complex task.

Through an interview with ten L2 learners after they have finished four speaking narrative tasks, Tavakoli (2009) found out that learners would perceive task difficulty by some criteria like the clarity of the pictures or story provided in the tasks, amount of information, task structures and affective factors such as their motivation and interest. Mahdavirad's (2017) research focused on investigating the effect of task complexity on EFL learners' perceptions of affective variables. By asking 20 learners to do a post-task questionnaire after they finished 12 speaking narrative tasks of different complexities, Mahdavirad discovered that learners showed less interest and motivation in the complex task that provided contextual support and planning time but with more challenging requirements.

Based on the above research about task difficulty, affective factors are the main examined variables of task difficulty. Therefore, learners' motivation, interest, confidence, stress, and perception of task difficulty are the focus of the present research.

2.3 Task Performance

A number of approaches are available for assessing task performance. Among these approaches, complexity, accuracy, and fluency (CAF) have been proved as three main measures of task performance (Skehan, 2009).

In terms of linguistic complexity, it indicates whether a learner uses more advanced language while performing tasks (Bui and Skehan, 2018). Linguistic complexity consists of two aspects, grammatical and lexical complexity (Bulte & Housen, 2012). Grammatical complexity is typically measured by the ratio of subordination while lexical complexity can be measured via lexical sophistication (Bui & Skehan, 2018). Lexical sophistication refers to the degree of rare words used by learners (Skehan, 2009). According to Bui (2019), lexical sophistication can be calculated by the value of Lambda via a computer program named P_lex devised by Meara and Bell (2001).

As for linguistic accuracy, two measures have been often adopted. The first measure is comparatively specific and focuses on the number of specific errors (*e.g.,* errors of verb forms). The other measure is more general, which calculates the ratio of error-free clauses. Compared with specific errors, the general measure focuses on all the errors, which can better reveal learners' speaking accuracy. Consequently, the general measure was adopted in the present study.

Fluency is viewed as "the ease, eloquence, and smoothness of speech or writing" (Bui, 2019). Skehan (2003) has argued that utterance fluency can be evaluated by speed, breakdown, and repair. Speed is calculated by the number of words produced per minute. The breakdown is assessed by the number or length of pauses. The repair can be evaluated by false starts, reformulation, repetitions, or replacement. Thus, in the present study, the number of pauses was utilized to measure breakdown whereas the number of repetitions and reformulation was for repair.

3. Methodology

3.1 Research Questions

In line with the purpose stated earlier in this study, the present research mainly focused on task complexity and task difficulty, and their relationship with speaking task performance. Therefore, the present study attempted to answer the following questions:

(1) Does Chinese EFL learners' English speaking performance in complexity, accuracy, and fluency

significantly vary with the tasks of different complexity?
(2) Is Chinese EFL learners' English speaking performance in complexity, accuracy, and fluency significantly correlated with task difficulty? If so, to what extent?

3.2 Participants
Twenty Chinese undergraduates majoring in English participated in the present study, who had an English course named *Communicative English for Chinese Learners (CECL)* in which TBLT was the main teaching approach. All of them had learned English for about 12 years and just accomplished National Matriculation Entrance Test (NMET), a valid high-stake exam in China. Their scores were more than 120 out of 150 in the English subject of NMET. Therefore, their English proficiency can be considered relatively similar, which helped rule out their English proficiency as an extraneous variable in this study.

3.3 Instruments
3.3.1 Tasks
The two tasks were selected from the textbook named *CECL (Level 1)*, the underlying theory of which is TBLT. Both tasks required teamwork and learners needed to describe things like boxes, lamps, and shoes from the perspective of sizes, shapes, colors, and functions. Additionally, cooperative communication was needed in both of the tasks as learners were required to discuss and make a decision about the most suitable box or pair of shoes. The first task required four learners to cooperate and select a box to pack a lamp. Each learner was provided with a picture with information about the size of the lamp or the boxes. Student A described his/her lamp while Students B, C, and D depicted their boxes respectively. During the communication, they could not show their pictures to others. After describing the lamp and the boxes in turn, they were required to discuss which box could be the most suitable for packing the lamp.

The second task focused on selling things. Learners were divided into several groups, with five learners in each group. Within each group, one learner acted as the buyer while another four learners were salespersons. Each salesperson possessed a type of shoes, and they were required to introduce their shoes in a fascinating manner to attract the prospective buyer. The task for the buyer was to ask for information about different types of shoes and make a decision on which to purchase. The given information mainly involved the size, appearance, material, usage, and price of the shoes.

Table 1. The Features of the Two Tasks Selected in this Study

		Task 1 (Simple)	Task 2 (Complex)
Direction		Deciding 1. Student A: describe the lamp shown in the picture and discusses the most suitable box for packing. 2. Students B, C, and D: describe three different boxes and discuss the most suitable box for packing.	Buying and selling 1. Salespersons: try to introduce the pair of shoes they are going to sell in ways that can attract customers to buy. 2. Buyer: ask for information about the pair of shoes he/she may choose.
Resource-directing	Reasoning demand	- Only describe the things (lamp and boxes)	+ Need to think of attractive ways to introduce the shoes
	Number of elements	+ Few Only the size of the objects	- Few Many details about the objects, including size, appearance, material, usage, and price of the shoes
Resource-dispersing	Planning time	- No planning time	- No planning time
	Prior knowledge	+ Learners frequently encounter the situation of borrowing and lending in daily life	- Learners seldom encounter the situation of selling objects.

Notes. + = with   - = without

In terms of resource-directing dimensions, intentional reasoning, and numbers of elements were analyzed. Task 1 did not require intentional reasoning since learners just described the objects whilst Task 2 entailed intentional reasoning because the learners as salespersons needed to resort to marketing strategies to highlight the distinctive features as a way to attract the buyers. As for the learners as buyers, they also needed to evaluate the introduction of the salespersons and make a decision. Additionally, learners only needed to describe the size of the lamp and the boxes, which indicated that few aspects of information about the lamp and the boxes were included in Task 1. On the contrary, Task 2 required salespersons not only to describe the appearance of the shoes, but also

the uniqueness, material, usage, price, and other features. As can be seen, Task 2 not only required learners to have intentional reasoning but also contained more information about the targeted objects. Hence, Task 2 appeared more complex than Task 1 in resource-directing dimensions.

Regarding resource-dispersing dimensions, no planning time is given in both tasks. However, learners owned prior knowledge about the situation of Task 1 since they might frequently encounter the situation of deciding the packing boxes for their gifts in daily life. By contrast, since the participants were all first-year undergraduates, none of them had experiences of selling things as required by Task 2. Accordingly, learners did not have much prior knowledge about the situation of Task 2.

After comparing these two tasks from resource-directing and resource-dispersing, Task 1 could be considered simpler while Task 2 was more complex.

3.3.2 Post-task Questionnaires

The post-task questionnaire was utilized to evaluate task difficulty. This questionnaire was underpinned by Robinson's (2001) nine-point scale which has been proved valid and reliable. Specifically, the five aspects to evaluate task difficulty in this scale were learners' confidence, motivation, interest, stress, and perception of task difficulty.

3.4 Data Collection

The research began with observing learners' performance in two different lectures, in which non-participatory observation was conducted. The first task was performed in the preceding lecture and the second in another lecture after a week. During the lecture, audio recorders were utilized to record the learners' speech for further linguistic analysis. After finishing each task, each learner was given a questionnaire concerning their perceptions of the difficulty of the task they have just performed.

3.5 Data Analysis

After the data were collected, learners' speech was first transcribed into English texts manually. Only the information of their speaking was transcribed while their tone was not considered. Based on the framework of CAF, learners' speaking performance was analyzed in terms of complexity, accuracy, and fluency. The specific measures of each aspect are summarized in Table 2. Cool Edit Pro 2.1 was utilized to calculate the number of pauses, time of the speech, and the number of words produced per minute. P_lex was applied to calculate the value of Lambda. Other measures were calculated manually. The results were summarized into descriptive statistics for further analysis.

Table 2. The Measures of Task Performance in this Study

Complexity	Grammatical complexity	The ratio of subordination
	Lexical complexity	Lexical sophistication: the value of Lambda
Accuracy	The ratio of error-free clauses	
Fluency	Speed	The number of words produced per minute
	Breakdown	The number of pauses
	Repair	The number of repetitions and reformulation

In the wake of such procedures, SPSS 22.0 was adopted to examine the relationship between learners' speaking performance, task complexity, and task difficulty. Primarily, an independent sample t-test was conducted to explore whether the Chinese EFL learners' speaking performance varied significantly in the two tasks of different complexity. Next, the Pearson coefficient was utilized to investigate the relationship between task difficulty and Chinese EFL learners' speaking performance.

4. Results and Discussion

4.1 Task Complexity and Chinese EFL Learners' Speaking Performance

As is summarized in Table 3, Chinese EFL learners' speaking performance in linguistic complexity (p=0.014 in RS; p=0.004 in VL) and accuracy (p=0.006) turn out to be significantly varied in these two tasks. No significant difference is found in learners' speaking fluency, since NWN (p=0.427), NP (p=0.523), and NRR (p=0.160) show no significant difference in the two tasks respectively.

Table 3. Chinese EFL Learners' Speaking Performance in Both Tasks

Performance	Complexity		Accuracy	Fluency		
Index	RS M/SD	VL M/SD	REFC M/SD	NWN M/SD	NP M/SD	NRR M/SD
Task 1 (Simple)	0.06 /0.09	2.69 /1.09	0.96 /0.55	98.35 /27.05	3.30 /3.60	2.40 /2.14
Task 2 (Complex)	0.18 /0.18	1.84 /0.56	0.90 /0.67	105.23 /27.22	3.95 /2.72	3.45 /2.48
Sig. (2-tailed)	**0.014**	**0.004**	**0.006**	0.427	0.523	0.160

Notes. M = Mean; SD = Standard Deviation; RS = Ratio of Subordination; VL = The Value of Lambda; REFC = Ratio of Error-free Clause; NWN = The Number of Words per minute; NP = The Number of Pauses; NRR = The Number of Repetitions and Reformulation

4.1.1 Task Complexity and Linguistic Complexity
In terms of learners' linguistic complexity, both grammatical complexity and lexical complexity vary significantly in the tasks of different complexity.

Specific to grammatical complexity, a significant difference in RS (p=0.014) exists between the two tasks. The RS in Task 1 (M=0.06) is less than that in Task 2 (M=0.18), which indicates that learners' speaking is more grammatically complex in a more complicated task. This result is in line with Robinson's (2001) finding that task complexity could increase learners' linguistic complexity.

The reason for such a result may lie in the setting of the tasks. Task 1 is a descriptive task, which only requires learners to describe the size of a lamp and three boxes from three aspects, *i.e.,* length, width, and height. There are some simple sentence patterns for describing these features, like "The width of the box is…cm." For example, a student reported her box simply saying, "The length of the box is 35 cm and its width is 25 cm." In other words, a simpler task comes along with less use of complex clauses, and thus RS turns lower, which suggests less grammatical complexity.

Although Task 2 also requires learners to portray the shoes which they are going to sell, there is a large amount of information they need to depict, such as the color, size, material, function, and other characteristics. On this occasion, learners tended to utilize relative clauses to further illustrate or explain the information about their shoes. For example, when a student introduced the material of the shoes, she said, "This shoes is designed in moisture-wicking textile lining, which means that it will absorb the sweat from your child's feet." Here she used a relative clause to further illustrate the advantages of the material of the shoes. Correspondingly, in a more complex task, the grammatical complexity increased along with the higher RS.

As for lexical complexity, VL (p=0.004) varies significantly in these two tasks. To be more specific, VL in Task 1 (M=2.69) is higher than the one in Task 2 (M=1.84). As was revealed by Meara and Bell (2001), the higher VL is, the higher the proportion of rare words used in a text is. Therefore, it can be concluded that learners' lexical sophistication is significantly different in these two tasks of different complexity. Such a finding is partially consistent with Robison's (2001, 2003, 2007) hypothesis that task complexity will influence learners' linguistic complexity. Surprisingly, learners' diction seems to be more sophisticated in Task 1 than in Task 2. This suggests that learners tend to use more rare words in a simpler task, while they use fewer in a more complex task. The requirement of the two tasks may be one of the essential factors. Task 1 requires learners to describe a lamp and three boxes. Learners would inevitably describe their shapes, which are relevant to geometry. Therefore, some geometry terms were frequently used by learners to describe the shapes of the lamp, such as "cuboid, cylinder, and rectangular prism". These terms are essential to accomplish the task and they cannot be replaced by other common words. In Task 2, where the information about different kinds of shoes is more difficult than that in Task 1, learners were inclined to replace those rare words for some more common words. For instance, one of the learners, in Task 2, rephrased her expression in a more listener-friendly fashion, and "cushion the foot" was replaced by "make the foot feel comfortable and soft".

4.1.2 Task Complexity and Accuracy
In reference to the accuracy, there exists a significant difference (p = 0.006) in learners' linguistic accuracy in two tasks and REFC in Task 1 (M=0.96) is higher than the one in Task 2 (M=0.90). Consequently, learners' speaking is more accurate in a simpler task whereas less accurate in a more complex task.

Possibly, this relates to the fact that more difficult information is provided in Task 2. Thus, as is aforementioned, learners tended to use more complex clauses such as relative clauses to further explain the information in Task 2. During this process, learners might inevitably ignore some basic grammar like the determiner, pronoun, the tense of the verbs, and the number of nouns. To name only a few, in Task 2 where learners needed to introduce a pair of shoes, many learners tended to use the determiner "this" with the plural

noun "shoes" or use the pronoun "it" to refer to the "shoes". For example, a student said, "This dark brown shoes is suitable for your little boy in his age". Here she failed to use "these" or "a pair of" before the plural noun "shoes". Another student said, "You must buy my shoes because it was, it is very fashioned." Likewise, she misused "it" to refer to her "shoes".

Another apparent mistake is that they tended to use the copula "is" after the plural noun "shoes". As is argued above, the student who tried to introduce her shoes used "is" after "my dark brown shoes".

These two mistakes are the most striking of all the mistakes. Possibly, learners have been used to using the pronoun "this" or "that" rather than "these" or "those", thus overextending the use of "this" and "that". Additionally, learners tended to miss the quantifier "a pair of" while talking about "shoes", which potentially brought about their misuse of the form of the copula.

4.1.3 Task Complexity and Fluency
Fluency is measured from NMN (p=0.427), NP (p=0.523), and NRR (p=0.160). The results show that fluency does not vary significantly in the tasks of different complexity, which is basically in line with Robinson's (2001) Cognitive Hypothesis that task complexity can improve learners' linguistic accuracy and complexity, but fluency cannot.

To conclude, Chinese EFL learners' English speaking performance of linguistic complexity and accuracy varies significantly in the tasks of different complexity. However, there exists no statistically significant difference in fluency between the tasks of different complexity.

4.2 Task Difficulty and Speaking Performance
According to Robinson (2001), task difficulty is comprised of five aspects, namely perception of task difficulty, stress, confidence, interest, and motivation. Generally, it reveals that four aspects of task difficulty, *i.e.,* perception of task difficulty, stress, interest, and motivation show no significant correlation with learners' speaking performance in linguistic complexity, accuracy, and fluency. Confidence, nevertheless, turns out to be significantly correlated with NWM (r=0.354, p＜0.05). It indicates when learners feel confident in fulfilling a task, their fluency will be simultaneously ramped up.

Task difficulty can manifest self-efficacy by Bandura's (2010) Social Cognitive Theory. Self-efficacy means people's beliefs about their capabilities to produce designated levels of performance (Bandura, 2010). In light of Bandura, people with high self-efficacy tend to perform more proactively and solve a problem more effectively. Accordingly, learners who are more self-confident in their capability might bolster up their zest in the speaking task. Potentially, this can spur them to produce more words so as to convey their own opinions, thus possibly helping to increase their speaking speed.

5. Conclusion and Implications
5.1 Conclusion
Aimed to explore the relationship between task difficulty, task complexity, and Chinese EFL learners' English speaking performance in linguistic complexity, accuracy, as well as fluency, this research arrives at the following conclusions. Primarily, Chinese EFL learners' grammatical complexity, lexical sophistication, and accuracy are significantly different in the tasks of different complexity. Specifically, higher grammatical complexity but lower lexical sophistication and accuracy exist in a more complex task. Additionally, the correlation between task difficulty and performance is present, but not as strong as expected. Task difficulty is solely significantly correlated to fluency. To be more specific, when learners' confidence to accomplish the tasks is boosted, they will respond to the task at a faster speaking speed.

5.2 Implications
A primary pedagogical implication is that teachers can manipulate task complexity when teaching different linguistic knowledge. Relative to task complexity, task difficulty is less correlated with students' speaking performance, so teachers should be dedicated to task design and fine-tune the task complexity in the teaching process to help students to improve their speaking performance. Since learners present higher grammatical complexity but lower lexical sophistication and accuracy while performing a more complex task, teachers can consider adjusting the task complexity flexibly by adding or reducing the amount of information to achieve different teaching goals. When teachers focus on difficult grammar teaching, a complex task can be taken into account. On the contrary, when they teach vocabulary or help the students to improve accuracy, they can resort to a simple task.

Meanwhile, teachers can pay heed to the development of the students' self-confidence since it is beneficial to the improvement of speaking fluency. Given that self-confidence was positively correlated with Chinese EFL learners' speaking fluency, teachers should be mindful of the development of students' self-confidence in the teaching process by offering more encouragement and positive feedback to students. For example, when students

cannot articulate their thoughts fluently in the process of completing a task, the teacher can encourage the students via words imbued with trust or eyes brimming with expectation and provide scaffoldings to help students achieve the task. For the language errors that students make in the task, while affirming the students in terms of their mindset or attitude, the teacher can help them acquire the correct expressions through recasts and other means. In a sense, it can develop students' self-confidence and maximize their motivation and initiative in the classroom, which in turn will help them improve their speaking fluency. Meanwhile, it can improve the efficiency of classroom teaching.

In a nutshell, this study tentatively explored the relationship between task complexity, task difficulty, and speaking performance, but which of these two exerts a greater effect on speaking performance, and what are their paths of influence on speaking performance, still need further research so that it can provide more in-depth insights into second language speaking instruction.

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