Morphological Awareness and Vocabulary Size among Chinese Tertiary ESL Learners in English-Speaking Countries

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Abstract: Morphological awareness is one of the determinant factors in language development, which can facilitate word reading and then facilitate later vocabulary knowledge. This study investigates morphological awareness and vocabulary size of Chinese ESL learners studying in universities in English-speaking countries and seeks to explore the relationship between these two factors. This study contributes to the existing literature on vocabulary development and enhances the understanding of English proficiency of ESL tertiary learners. Two morphological awareness tasks and a three-level Vocabulary Test are given to Chinese students studying in universities in English-speaking countries. The purpose of this study is to answer the following research questions: (1) To what extent international students in the higher education sector are aware of the morphemes?; (2) What is the average English vocabulary size of them ESL students studying in English-speaking countries?; (3)Is there any correlation between morphological awareness and vocabulary level? The result reveals that students have a good understanding of both the Morpheme Identification Test and the Morphological Structure Test. All the students have mastery of academic vocabulary, and some students reach a 5,000-word level vocabulary size. No significant correlation was found between students' morphological awareness and their vocabulary level, which might be due to L1 influence, learner differences, and the lack of morphology teaching in the curriculum.

Keywords: Morphological Awareness; Vocabulary Size, Tertiary education, ESL, Chinese Learners

1.   Introduction

The number of Chinese students studying aboard keeps increasing despite the issues of travel restrictions and public health caused by the Covid-19 pandemic. According to ICEF, the record number of Chinese students studying for a degree abroad is 1,061,511 in 2021 [1]. With English-speaking countries as the popular destination for studying, the English proficiency of Chinese students, especially academic English proficiency, is one of the determinants of academic success [2]. Despite Chinese students should have qualified English language results as one of the entry requirements of universities, language difficulties are frequently at the center of these overseas

students' academic adjustment concerns [3]. As ESL international students, their English proficiency affects their academic performance as well as their well-being while living in another country.

One of the factors that have a critical impact on language development over time is morphological awareness. Morphological awareness is the ability to being able to analyse and manipulate morphemes and morphological structures [4], which plays a considerable role in both first language and second language acquisition. For example, morphological awareness makes long-term influences on children's first language literacy development [5]. Moreover, morphological awareness contributes to the development of multiple skills, such as reading comprehension skills [6], spelling and writing skills [7], and listening comprehension skills [8]. Therefore, studying morphological awareness and what is associated with good morphological awareness is significant to language teaching and learning.

Previous studies have mostly focused on the relationship between morphological awareness and reading comprehension skills. For example, in a longitudinal study, Tong et al. examined related reading abilities of grade 3 to grade 5 students and found that poor morphological awareness could lead to reading comprehension issues [9]. Levesque et al. studies 221 English-speaking children in Grade 3 and revealed that morphological awareness could contribute to reading comprehension in both direct and indirect paths [10]. MA improves children's ability to comprehend and grasp morphologically complicated words, which improves their text comprehension. Besides English monolingual children, morphological awareness of other languages is also studied by scholars in various places. Haase and Steinbrink investigated how literacy and morphological awareness relate to German-speaking primary students in German, which is a language with an asymmetric orthography [11]. They revealed that phonological awareness, instead of morphological awareness, was the main factor in deciding on reading abilities.

Morphological awareness contributes to vocabulary knowledge in both first language and second language. For pre-schooled children, Mcbride-Chang et al. investigated children from three language groups, which are Cantonese, Mandarin, and Korean [12]. Their findings highlighted the importance of MA in predicting children's early vocabulary development and the mutual influences of vocabulary learning and MA. For ESL students, Unthiah studied French ESL students in secondary school and found that French morphological awareness contributed to vocabulary acquisition, similar to the influence of MA on English monolingual speakers' vocabulary development [13].

For ESL adult learners, morphological awareness is found significantly correlated. Zhang and Koda examined morphological awareness of L2 language and reading comprehension among advanced Chinese EFL readers in a university in China [4]. The study found that morphological awareness contributed to L2 vocabulary knowledge directly and indirectly through the mediation of learners' lexical inferencing ability. Asaad and Shabdin investigated the relationship between Morphological Awareness and Vocabulary Errors among 26 L2 postgraduate students at a Malaysian university and found that Morphological awareness helped L2 students avoid vocabulary errors in academic writing, such as misformation error, omission error, addition error, blending error, and misorder error [14]. Therefore, studying L2 learners' morphological awareness in an academic context plays an important role in their vocabulary development and the improvement of other skills such as writing.

However, a limited study associates morphological awareness with vocabulary size and was conducted among Chinese students studying in English-speaking countries. This study aims at measuring the morphological awareness and vocabulary size of Chinese students, while investigating the association between morphological awareness and vocabulary size.

This paper seeks to answer the following research questions. First, to what extent international students in the higher education sector are aware of the morphemes. Second, what is the average

English vocabulary size of them ESL students studying in English-speaking countries. Third, is there any correlation between morphological awareness and vocabulary level.

2. Methodology

2.1. Participants

The participants in this study are 30 undergraduate Chinese students (7 males and 23 females) studying various majors (except English Studies and Linguistics major) in universities in English-speaking countries, such as Australia, the United Kingdom, and Malaysia. Most of the learners are between 22 to 26 years old. As one of the common prerequisites of entering universities in English-speaking countries, international students should demonstrate their English proficiency by providing a qualified score in international language exams such as IELTS and TOFEL. Therefore, the participants in this study are upper intermediate to advanced English learners.

2.2. Instruments

Two Morphological Awareness Tests (morpheme identification & morphological structure) and a set of Vocabulary Level Test (academic vocabulary, 5000-word level, 10000-word level) are given to students via the internet. Students are required to finish the test within a 30-minute time limit.

a. Morpheme Identification Test

Morpheme identification refers to the ability to discern between distinct meanings of homophones [12], which helps language learners in distinguishing the meanings of syllables with similar sounds and their vocabulary development. The Morpheme Identification Test from Farsi is employed in this study [15]. This test includes 14 questions and one example will be given to participants. In this test, participants will be asked to segment the words into meaningful chunks and explain what each chunk means.

b. Morphological Structure Test

Morphological Structure is the ability to generate new meanings from learned morphemes [12]. Through evaluating participants' capacity to interpret and break down the words into smaller chunks, learners' ability to manipulate language is tested in the Morpheme Identification Test. This test from Farsi contains 14 components [15]. In each question, participants will have to give the word based on the context and hints.

c. Vocabulary Levels Test (VLT)

The vocabulary test adapts from Schmitt's Vocabulary Levels Test (VLT), which contains vocabulary levels including 2000, 3000, 5000, 10000-word levels, and academic words [16]. In this study, we employ the 5000-word level, 10000-word level, and academic words test based on the English level of participants. According to the requirements of vocabulary size for high school graduates in China, year-8 students should possess 3,300 vocabulary and year-9 students should have 4,500 vocabulary size [17]. Therefore, considering test efficiency and avoiding the invalid data caused by long surveys, the 3000-word level test is unnecessary for this cohort of participants.

2.3. Procedure

The 30 participants who consented to take part in the study were told the purpose, procedure, and privacy protection information. They received a link on Google Forms (www.google.com.au/forms) that contained Morphological Awareness Tests and Vocabulary Levels Test. They were required to

avoid using any dictionary during the test. Participants were given detailed explanations if they have any questions about the study or an individual question.

2.4. Data Analysis

The present study adopts a quantitative approach and the data collected is analysed through IBM SPSS statistics version 26 including descriptive analysis and Pearson correlation coefficient to analyse the correlation between the items within Morphological Awareness Tests and Vocabulary Levels Test.

3. Results

3.1. Results of the Morphological Awareness Test

The reliability for the overall MA Test is 0.80, which represents that the test and the results are reliable. For the overall Morphological Awareness Test, the mean is 54.67 out of 70, with a maximum score of 65 and a minimum score of 41, which shows an acceptable distribution (SD= 6.18).

As Table 1 shows, the mean of the Morpheme Identification Test is 28.33 out of 35 and that of the Morphological Structure Test is 26.33 out of 35. The scores ranged from 23 to 35 for the Morpheme Identification Test and ranging from 15 to 33 for the Morphological Structure Result Test. The Standard deviations for the two tests are 3.12 and 4.80 respectively, which shows that the whole participants have relatively comprehensive knowledge of MA.

Table 1: Descriptive Analysis of Morpheme Identification Test and Morphological Structure Test.

	Min	Max	Mean	SD	Median
Morpheme Identification Test	23.00	35.00	28.33	3.12	29.00
Morphological Structure Result Test	15.00	33.00	26.33	4.80	28.00

Table 2 shows the means of inflectional morpheme, derivational morpheme, and stem test are 8.10, 11.53, and 35.05 and the data disperse reasonably. The stem aspect scores the highest among the three aspects.

Table 2: Descriptive Analysis of inflectional morpheme, derivational morpheme, and stem.

	Min	Max	Mean	SD	Median
Inflectional morpheme	4.00	10.00	8.10	1.69	8.50
Derivational morpheme	5.00	17.00	11.53	2.65	11.50
Stem	27.00	40.00	35.03	3.59	35.50

3.2. Results of Vocabulary Level Test

The reliability of all the items in the Vocabulary level test is also generated through Cronbach's alpha. The reliability of VLT is 0.75, which indicates that the reliability quality of the research data is good. However, if the items in Academic Vocabulary are deleted, the reliability will increase significantly to 0.86.

Table 3 shows the descriptive analysis of academic vocabulary, 5000-word level, and 1000-word level tests. The means of academic vocabulary, 5000-word level, and 1000-word level tests are 28.37, 21.23, and 9.07 out of 30, which indicates that participants score the highest in academic vocabulary sessions in general while scoring the least in the 1000-word level test. The highest scores for academic vocabulary sessions and 5000-word levels are both 30 out of 30, while that of the 10000-word level

is 28. The minimum scores for each session are 24, 8, and 0. The dispersion of the 10000-word level test is the highest (SD=8) among the three sessions.

Table 3: Descriptive Analysis of academic vocabulary, 5000-word level, and 1000-word level test.

	Min	Max	Mean	SD	Median
Academic vocabulary	24.00	30.00	28.37	1.67	29.00
5000-word level	8.00	30.00	21.23	6.63	22.50
10000-word level	0.00	28.00	9.07	8.00	7.50

3.3. Relationship between MA and Vocabulary Size

Pearson correlation coefficient is used to analyse the correlation between MA Test and Vocabulary Test. As shown in Table 3, the correlation among the six items is very weak. Morpheme Identification is weakly correlated with Academic Vocabulary, 5000-word level test, and 10000-level test, in which the coefficients are 0.18, 0.11, and 0.10, while others are all close to 0. Table 2 shows the correlation between the Vocabulary Level Test and the three aspects of the MA Test. Inflectional morphemes and Academic Vocabulary show a low correlation with a coefficient of 0.32, and also approach a certain trend toward significance (p= 0.088).

The overall Morphological Awareness Test shows no significance to Vocabulary Level Test. This uncorrelated relationship might be explained from several perspectives which will be discussed in the next session.

Table 4: Pearson Correlation between MA Test and each of the Vocabulary Level Test.

	Morpheme Identification	Morphological Structure	MA Overall
Academic vocabulary	0.18	-0.01	0.09
5000-word level	0.11	-0.05	0.02
10000-word level	0.10	0.05	0.08

* $p<0.05$ ** $p<0.01$

Table 5: Pearson Correlation between MA Test and each of the Vocabulary Level Test.

	Inflectional morphemes	derivational morphemes	Stems	MA Overall
Academic vocabulary	0.32	0.13	-0.09	0.09
5000-word level	0.12	0.12	-0.11	0.02
10000-word level	0.18	0.1	-0.01	0.08
VLT Average	0.184	0.120	-0.067	0.062

* $p<0.05$ ** $p<0.01$

4. Discussion

4.1. Morphological Awareness of Chinese ESL Tertiary Learners

The result of the Morphological Awareness Test reveals that participants have a good understanding of morphemes (M=54.67). Morphological Awareness Test contains two aspects, which are Morpheme Identification and Morphological Structure. The overall performance in Morpheme Identification Test (M=23.33) is better than that in the Morphological Structure Test (M=26.33). In the Morpheme Identification Test, most students are able to separate the vocabulary into small parts

but can not define or explain the morphemes, which demonstrates that these Chinese ESL learners have some knowledge of MA but are not systematic and professional knowledge. While some participants failed to construct new vocabulary using the familiar morphemes in the Morphological Structure Test. Although learners' individual differences (such as cultural backgrounds and risk-taking personalities) might have a role to play when they encounter a new question type, participants' overall ability to define the morphemes and construct new vocabulary is insufficient.

4.2. Vocabulary Size of Chinese ESL Tertiary Learners

Vocabulary is considered to be an important factor in literacy development among ESL learners. The vocabulary knowledge of L2 learners' can determine how they perform in terms of their listening, speaking, reading, and writing [18]. As Laufer and Nation state, the mastery of a certain word level in VLT is determined by having 24 or more correct vocabulary at that level [19]. The result shows that Chinese students have a good command of academic vocabulary with a mean of 28. However, in the 5000-word level (mean=21) and 10000-word level (mean=9), most students did not show the ability to master the related vocabulary.

All the participants have mastery of academic-level vocabulary. As university students, they are familiar with language use in the academic setting through substantial reading and listening. Masrai and Milton's study reveals that Academic vocabulary knowledge and total vocabulary contribute significantly to the differentiation of GPA [2], which means that having a good command of academic vocabulary is one of the predictors of academic success. On the other hand, the lack of vocabulary will hinder students' academic performance in higher education and their future career success [20]. As Schmitt states, 5000-word families are needed if they need to read authentic texts, most participants might encounter some lexical issues in reading authentic materials [21].

4.3. The Relationship Between the Results of Morphological Awareness Test and Vocabulary Level Test

The statistical data shows the insignificance between the Morphological Awareness Test and Vocabulary Level Test. However, there might be several possibilities to explain this result.

Firstly, the transfer of L1 might impact the English MA. English and Chinese are two different languages in terms of cultural aspects, vocabulary, and morphemes. Chinese as a morpho-syllabic language employs compounding awareness [22], which means that most Chinese words are compounded with two morphosyllables. For instance, by combining 书 (book) and 包 (pack), we get 书包 (school bag) [1]. While compounding happens less in English. English is an alphabetic language that contains more derivational morphemes [22]. Shen further found that Chinese derivational awareness is not a reason for unique variation in English vocabulary or reading comprehension [22]. This resonates with Zhang and Koda's finding, which demonstrates that reading comprehension in one language did not reveal a significant cross-linguistic association with derivational knowledge in the other language [23]. Therefore, the difference between Chinese and English morphemes might explain the relationship between MA and vocabulary.

Second, learners' individual differences in learning vocabulary might lead to variance in MA. Translation is one of the learning strategies that ESL learners would like to use. A study conducted on Tunisian secondary students revealed that participants, who learned vocabulary using L1 translation procedures, outperformed their counterparts who learned vocabulary through strategies that exclusively used the target language, in terms of vocabulary depth [24]. However, Shi points out the tendency of neglecting English inflections when translating to Chinese as verb inflections do not exist in Chinese [25]. In this way, an ESL learner might have a deep understanding of vocabulary or be confused by the translation.

Third, the variation in vocabulary level and morphological awareness might be due to a lack of systematic morphological knowledge content in the Chinese Curriculum. Although the 2017 version of English Curriculum Standards for High School in China includes understanding the stems and affixes of vocabulary, mastering the alternation rules of part of speech, and using them to understand and express information and views on topics [26], there is still limited resource and textbook that involve morphology teaching. By knowing more common root words and breaking the complicated word down, many of the unfamiliar vocabulary students encountered may be understood [6]. From the results, some participants have vague ideas about what a morpheme is but they cannot name and define it. Therefore, explicit teaching and implicit teaching could be combined to teach morphology-related knowledge. Kieffer and Lesaux recommend teaching prefixes, suffixes, and roots explicitly using various ways, such as collaborative learning [6]. They also advise teaching knowledge of how words are transformed. These teaching methods might help students enhance morpheme identification and morphological structure awareness.

5. Conclusion

This study answers some of the research questions proposed. Chinese students studying in English-speaking countries have a good understanding of the two aspects of the morphological awareness test, the Morpheme Identification Test and the Morphological Structure Test. The overall scores in Morpheme Identification Test outperform the Morphological Structure Test, which indicates that they have adequate skills in separating morphemes but inadequate skills in constructing new vocabulary using familiar morphemes. In terms of the types of morphemes, students have a good command of stems, maybe because the stems are more related to the word meanings.

With regards to vocabulary level, all the students have mastery of academic vocabulary, which supports them to read extensively in an academic context. Some students reach the 5,000-word level and few students achieve the 10,000-word level. However, students who do not have mastery of the 5,000-word level might have academically read authentic materials.

Finally, there is no significance found between the Morphological Awareness Test and Vocabulary Level Test among these students in English-speaking countries. The possible explanation for the result could be: (1) The influence of L1 on English MA; (2) the learner's individual differences in learning vocabulary; and (3) the lack of systematic morphological knowledge content in the Curriculum.

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