Prototype of the English Verb Stand
A Mental Representation of Chinese Learners

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Abstract

This paper presents two experiments investigating the prototype of the English verb *stand* for native Chinese learners of English. Using the criteria of ease of elicitation and the magnet effect of prototypes, the study employed a sentence generation task and a sentence sorting task. In the sentence generation task, subjects were asked to produce ten sentences using the verb *stand*. In the sentence sorting task, a separate group of subjects were asked to sort the sentences into groups based on the meanings of *stand*. The results indicate that the senses *"be upright or on one's feet"* and *"get up onto one's feet from another position"* serve as prototypes of the verb *stand* for native Chinese learners of English. The findings highlight the multi-faceted nature of prototypes, suggest a reliable methodology for its investigation, and reveal how exposure to a specific sense influences prototypes among L2 learners.

Keywords: prototype, polysemous verb, mental representation, converging evidence, native Chinese learner s of English

1. Introduction

Polysemy is one form of linguistic ambiguity where a single word has more than one related but distinct meanings or senses. It is estimated that polysemous words account for 97 percent of the most frequent words in English (Gibbs, 1994). Undoubtedly, this phenomenon has received considerable attention within cognitive linguistics. The models in this field, unlike the traditional models claiming that word senses are simply represented as an arbitrary list of discrete lexical items that happen to share the same phonological form (Tyler & Evans, 2001), argue that a polysemy constitutes a natural category of related senses (Brugman & Lakoff, 1988; Lakoff, 1987; Langacker, 1993; Tyler & Evans, 2001; Gries, 2019; Ramsey, 2022). Following this line of argumentation, the multiple senses of a polysemy are understood to be organized around a prototypical sense from which other peripheral senses are extended through general cognitive principles to form a lexical network. Consequently, the identification of the prototypical sense of a word is a crucial first step in cognitive lexical semantics.

Researchers have proposed and implemented various approaches to identify which sense is the prototypical one of a word. While early studies (e.g. Lakoff, 1987) concerning this issue mostly relied on researchers" intuition and introspection, recent decades have seen the introduction of a variety of empirical approaches, including psychological experiments and corpus-based analyses. The corpus-based approaches tend to be associated with earliest acquisition and the etymological origins of a sense of a lexeme (Dobrić, 2015; Gilquin, 2006). In contrast, the psychological experiments are more likely to be conducted based on the characteristics of prototype, such as ease of elicitation, asymmetrical judgements of goodness or similarity, gradation within the category, and selective emphasis (Rice, 1996; Gries, 2006; Dobrić, 2015).

While these approaches have provided more empirical evidence on the identification of semantic prototypicality than intuition-based analyses, most of them are considered single-factor approach (Dobrić, 2015) as they focus on a single prototypicality-affecting factor. A main problem with this approach is that different prototypical senses may be identified for the same polysemous word depending on the approaches used. For example, the approach based on the criteria proposed by Tyler and Evans (2001, 2003) may suggest that the sense *"motion"* is the prototype of the English verb *run* because most other senses derive from it. However, Gries (2006) has identified the sense *"fast pedestrian motion"* as the prototypical sense through analyzing the behavioral profile of verb *run*. This discrepancy underscores the need for converging evidence—that is, combining multiple approaches and criteria to identify semantic prototypicality more reliably (Dobrić, 2015). Thus, this study adopted a combined approach.

Moreover, while significant research has focused on identifying the prototypical sense of certain prepositions, relatively few studies have applied prototype theory to verbs (Stamenković & Tasić, 2013). The limited research on verbs, such as *climb* in Taylor (2003) and *run* in Gries (2006), suggest that the prototypicality effects of verbs are more challenging to analyze (Stamenković & Tasić, 2013). Additionally, verbs are found to be harder to process and are acquired later than nouns. For instance, Szekely et al. (2005) found that verbs exhibit lower recall rates than nouns in memory tasks. These findings highlight the need for further research focusing on verbs.

From a cognitive linguistics perspective, the verb *stand* is both a complex polysemous word and a pervasive bodily experience in our lives. That is, the senses of verb *stand* are not arbitrary but motivated by recurring bodily experience in the real world, which are referred to as image schemas. Gibbs (1994) has found that English native speakers perceive multiple senses of verb *stand* similar in meaning, partly based on the underlying image schema profile for each use of the word in context. However, the prototypical sense of *stand* remains unclear, particularly for English L2 learners. For these reasons, the English verb *stand* was chosen as the focus of this study.

More importantly, nearly all the research discussed thus far involves only native speakers of English, leaving a gap in evidence from English L2 learners. Rice (1996) argued that both child language acquisition and second language acquisition can provide evidence for semantic prototypicality. Building on this argument, the present research aims to identify the prototypical sense of the verb *stand* among native Chinese learners of English. This research constitutes the first step in proposing the lexical network of verb *stand* and contributes to a better understanding of the mental representation of English polysemous words from the perspective of English L2 learners. These findings could also inform vocabulary teaching in English L2 contexts.

2. Literature Review

2.1 Basics of Prototypicality in Cognitive Linguistics

Prototypicality is a notion originating in the field of psychology and closely linked to the study of categories. The study of prototypicality can be traced back to Kant's prototypical approach to categories and Husserl's notion of categorical intuition (Stamenković & Tasić, 2013). However, contemporary semanticists tend to consider Wittgenstein as the forefather of prototype effect. In his analysis of the category GAME, Wittgenstein (1953/2019) observed that the category members are related to each other by means of overlapping similarities—referred to as "family resemblances"— rather than a set of features common to all members. This perspective stands in contrast to traditional models of categorization, which assert that categories are defined by a set of several necessary and sufficient conditions. But the real challenge to traditional models of categorization came from the notable work of Eleanor Rosch (1973, 1975), who demonstrated that categories are not clearly bounded and that some members are more representative or central than others. Rosch's findings laid the foundation for the modern understanding of prototypicality, showing that categories are graded and hierarchical in nature.

Given the relevance of this notion to their field, cognitive linguists have applied prototypicality to linguistic categories, including those formed by the different senses of a polysemous word (Gilquin, 2006). They argue that polysemy constitutes natural categories of multiple interrelated senses, with some senses being more central or prototypical than others (Brugman & Lakoff, 1988; Lakoff, 1987; Rice, 1996; Gilquin, 2006; Gilquin & McMichael, 2018; Ramsey, 2022). Additionally, cognitive linguists propose that a polysemy is best represented as a lexical network.

An idealized network is illustrated in Figure 1. In this figure, the prototype, represented by a solid central node, lies in the center from which peripheral senses radiate outward as separate nodes. According to cognitive linguistics, peripheral senses are extended from the prototype through general cognitive principles and pragmatic knowledge. This notion of the prototype forms the theoretical foundation of the present study.

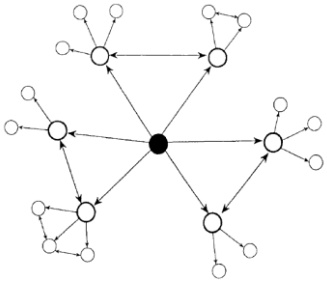

Figure 1. An idealized lexical network

2.2 Prototype of Polysemous Words

2.2.1 Intuition-based Studies on Prototype

After the notion of prototypicality was applied to linguistic categories, many cognitive linguists attempted to search for the prototypes within various lexical categories. Brugman (1981) pioneered the cognitive linguistic analysis of polysemy by focusing on the preposition *over*. Following Brugman's account, Lakoff (1987) reanalyzed the structure of senses of *over,* characterizing the image schemas associated with each sense. Both researchers described each sense at a highly fine-grained level, concluding that the prototype of *over* was *"over and across"* as in *The bird flew over* (Figure 2). This sense primarily denotes a spatial relation between two entities, with the bird in focus as the TRAJECTOR (TR) and the other being not in focus as the LANDMARK (LM) (Talmy, 1978; Tyler & Evans, 2001) which is what the bird is flying over although it is unspecified in this case. The arrow represents the PATH along which the TR bird moves.

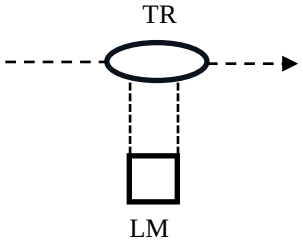

Figure 2. The bird flew over

Although these studies sparked extensive research on the semantics of over, their highly fine-grained approach to semantics of polysemy posed a challenge that the potentially unconstrained number of senses would be included within a semantic network. To address this, Kreitzer (1997) refined the analysis by positing that a spatial scene was inherently conceptualized in terms of three different levels of schemas, namely the relational level, the component level, and the integrative level. Based on Kreitzer's account, the component level involves conceptual primitives, such as TR, LM, contact between TR and LM, verticality, among others and these combine to form the relational level which represents a specific sense of a preposition. Far departure from Lakoff, Kreitzer argued that image-schema transformations should not be identified as a new sense but simply as a means of extending an existing sense (Tyler & Evans, 2001). By adopting this framework, Kreitzer (1997) effectively constrained the number of senses for *over* and identified *above* as its prototypical sense as in *The picture is over the fireplace* (Figure 3). In Figure 3, the *picture* is understood as a TR positioned relative to the fireplace, which is conceptualized as a LM. It might be noted that the path in this case is not specified as *over* here denotes a static spatial relation. The dotted lines represent the LM's extreme boundaries.

Figure 3. The picture is over the fireplace

These studies have led us into an embarrassing situation as different researchers could identify divergent yet equally plausible prototypes for the same polysemous word. One reason behind this inconsistency is that the analysis relied on intuition that researchers usually cannot explicitly articulate. As Tyler and Evans (2001, 2003) pointed, "the researchers' decisions on the prototypes were primarily asserted rather than rigorously justified". This issue extends to verbs, as demonstrated in Norvig and Lakoff's (1987) analysis of the verb *take*. Based on their judgments of the semantic roles associated with various senses, they proposed that the prototypical sense of *take* was *grabbing*. However, as Sandra and Rice (1995) observed, any early analysis of what constitutes a primary sense for a polysemy is too subjective to some extent. Rice (1996) further argued that the identification of the prototype for a given polysemy may only reflect the analytic skills or subjective aesthetic of the individual researchers. These limitations underscore the need for empirical studies to provide robust evidence on determining the prototype of a polysemous word. Addressing this gap has been one of the driving forces behind the present research.

2.2.2 Empirical Studies on Prototype

In recent decades, much attempt has been undertaken to address the limitations that the early studies relied heavily on researchers' intuitions. Cognitive linguists have put forward different criteria for identifying the primary sense of polysemous words (Gilqui & McMichael, 2018; Mori, 2019; Rice, 1996; Tyler & Evans, 2001, 2003; Taylor, 2019). Take the work of Tyler and Evans (2001, 2003) as an example, through their reanalysis of the senses of preposition *over* and the examination of more than twenty other English prepositions (e.g. *beneath, below, above)*, they suggested that four types of linguistic evidence can be used to decide on the prototype of a given polysemy. The evidence includes earliest attested meaning, predominance in the semantic network, relations to other prepositions and grammatical predictions. Similarly, Rice (1996) proposed criteria, which he termed "characteristics of prototype", from the cognitive perspective. These criteria include asymmetrical judgements of goodness, individual variation in the prototype, gradation in the category, ease of elicitation, selective emphasis, and ease of imageability. These criteria provide methodologies for determining the prototype of a given polysemy in an intersubjective way.

Undoubtedly, these criteria have inspired empirical studies, particularly psychological experiment, to identify prototypes of polysemous lexemes. A notable work is Rice's (1996) analysis of prototypes of English prepositions *at, on* and *in*. In his research, Rice (1996) designed different experimental tasks based on specific criteria: a sentence similarity task on asymmetrical judgments of goodness and gradation within the category, a sentence generation task on individual variation and ease of elicitation, and a sentence sorting task on asymmetrical judgments of goodness and magnet effect. The data from these experiments revealed that both temporal and spatial usages could be candidates for prototypes of these prepositions. This finding is quite a contrast to our traditional assumption that prepositions primarily denote spatial relations. However, Rice's findings suggest the possibility that a polysemy has multiple prototypes. This result is also

repeated in Gilquin and McMichael (2018), who tested different criteria for determining the primary sense of the preposition *through*. Their findings revealed no consensus: the construction [X MOVES THROUGH Y] was identified as the prototype for its frequent elicitation, while historical corpus data pointed to the instrumental usage as central. These results highlight the variability inherent in prototype identification.

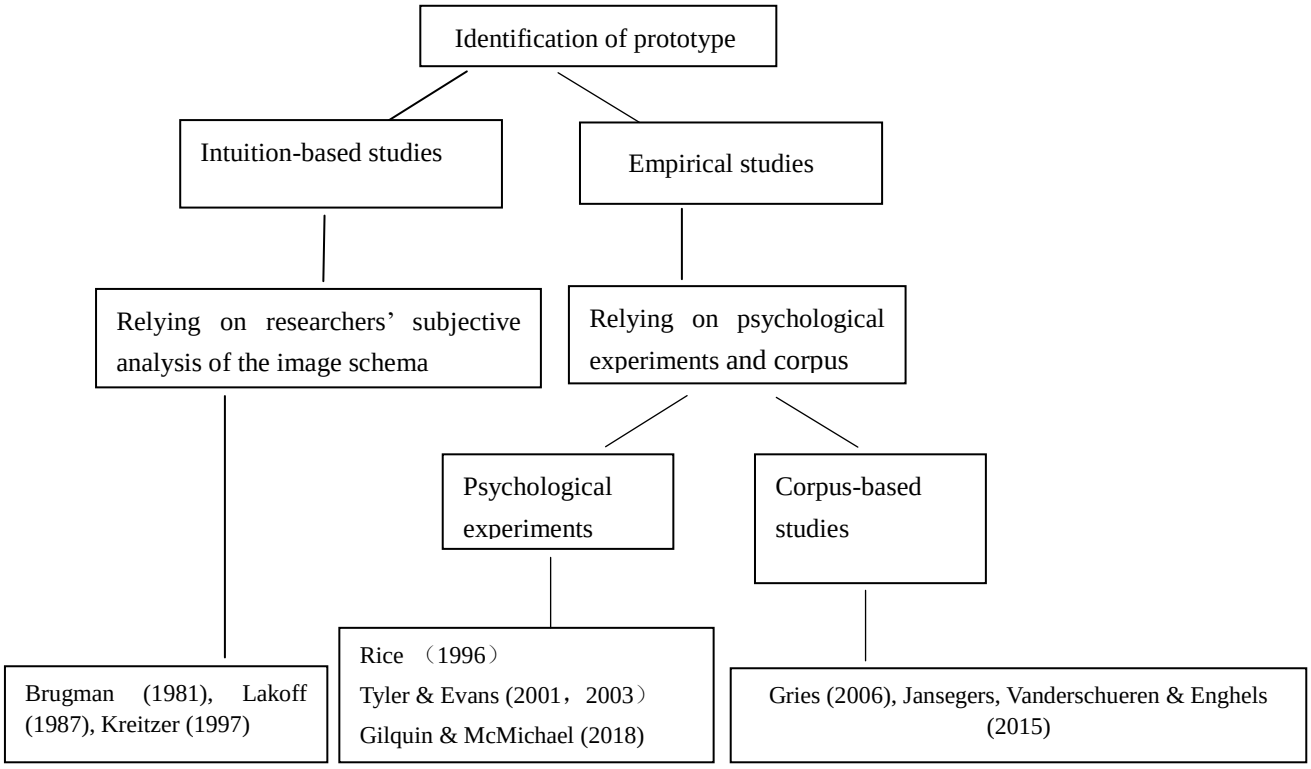

Figure 4. The studies on prototype

Additionally, the recent corpus-based analyses have further contributed non-arbitrary evidence on the identification of prototypical senses. For instance, Gries (2006) analyzed the behavioral profile of the verb *run* and identified its prototypical sense as *fast pedestrian motion*. This sense exhibited the highest number of linguistic parameters and was the least formally constrained, aligning with Lakoff's (1987) conceptualization. However, Tyler and Evans (2003) argued that *motion* was the prototypical sense. Building on Gries' approach (2006), Jansegers, Vanderschueren and Enghels (2015) examined the prototype of Spanish perception verb *sentir* (feel) and found that its prototypical sense was *general physical perception*, which, despite being less frequent, was the least formally constrained.

In short, various linguistic and cognitive criteria have been developed to identify the prototype of polysemous words. Studies have demonstrated the effectiveness of these criteria for prepositions, verbs, and other lexical classes, offering a more systematic and intersubjective framework for analyzing prototypicality within categories. The studies reviewed on prototypes thus far are summarized in Figure 4.

However, as shown in most of the studies, relying on an individual criterion can lead to different prototypes of the same word. Therefore, a combined approach, incorporating multiple criteria, is more appropriate for identifying the primary sense of a polysemy. Dobrić (2015) emphasized the importance of converging evidence in evaluating semantic prototypicality—a principle adopted in the present study.

A notable limitation of available studies is its predominant focus on native speakers of English and Spanish, with little attention to second language learners. It remains unclear whether these criteria are equally applicable and effective in second language contexts. Rice (1996) suggested that examining the acquisition of prepositional usages by second language learners could shed light on the conceptual and linguistic basis of lexical organization. Extending this view, we argue that exploring second language learners' acquisition of verbal usage can offer valuable insights into the conceptual structure of linguistic knowledge. Accordingly, the present study investigates the prototypical sense of the verb *stand* among native Chinese learners of English through empirical experimentation.

3. Empirical Tests of the *Stand* Prototype

This section reports two experiments aimed at identifying the prototype of the English verb *stand* among native Chinese learners of English. These experiments employed a sentence generation task and a sentence sorting task, respectively. The data from both

experiments are described and analyzed, along with an introduction to the methodologies used to explore the prototype of the verb *stand*. These experiments, though preliminary, address certain claims concerning the prototypicality of lexical categories.

3.1 Experiment 1: Sentence Generation Task

3.1.1 Rationale

According to Rice (1996), ease of elicitation is one of the characteristics of prototypes. It suggests that prototypical senses are more easily retrieved and, therefore, produced most frequently. Taylor (2003) further claims, "when a person is required to produce sentences with a given word, certain senses of that target word will come to his mind earlier and be cited more frequently". This criterion aligns closely with the original psychological concept of prototypes identified by Rosh (1973, 1975) and colleagues. In their research, subjects were asked to name the first member of a category they could think of, for instance, the name of a fruit. The logic underlying this type of elicitation task is that the more entrenched items in language learners' mental representations are the ones that come to mind first when prompted with the name of a category (Gilquin & McMichael, 2018).

3.1.2 Method

Subjects. There were 68 undergraduate students serving as subjects in this task. All of them were native-speakers of Chinese, learning English as a foreign language in Taishan University, a comprehensive state-owned university in China. The subjects were all majoring in financial management, but English was a compulsory course for them to get Bachelor's Degree. Table 1 provides detailed information about subjects.

Table 1. The information about subjects in sentence generation task

Task	Number of subjects	Major of subjects	Number of collected answer sheets	Number of males	Number of females	Number of discarded answer sheet	Number of Valuable answer sheet
Sentence generation	68	Financial management	68	30	38	4	64

Materials. The material used in this task was a sheet of paper with ten long black lines, each numbered from one to ten.

Procedure. The experiment adopted Rice's (1996) sentence generation task, which involves eliciting a number of sentences based on a stimulus word. The experiment was conducted in a classroom with the assistance of the subjects' English teacher. A pilot study with 12 students of the same major revealed that subjects needed 20 minutes —rather than the 10 minutes allocated by Rice (1996) — to complete the task. Accordingly, all subjects in the main experiment were given 20 minutes to produce their 10 sentences. At the beginning of the experiment, each subject was given a sheet of paper and instructions about how to complete the task. Subjects were asked to write down 10 sentences containing the verb *stand* in English along the lines provided. They were explicitly told not to look up the dictionary or discuss with others. After 20 minutes, all answer sheets were collected.

Data collection. An initial quality check of the collected sheets resulted in four being discarded as they did not meet task requirements. Two sheets had fewer than 10 sentences (one had seven, and the other had eight sentences), and two contained sentences where *stand* was used as a noun rather than a verb. Although *stand* can function as a noun, this study focused exclusively on its verbal usage. Consequently, data from 64 subjects, comprising 640 sentences, were deemed valid.

The senses of *stand* occurring in these sentences were identified by two researchers based on the definitions provided in the *Oxford Advanced Learner's English Chinese Dictionary (OALECD) (Yu & Zhao, 2023)*. Only senses on which the researchers reached 100% agreement was considered. An English native-speaker was invited as an expert to resolve cases where the researchers initially disagreed. Special attention was given to the sense of *stand* in the first sentence produced by each subject, as these were assumed to occupy a central position in the subjects' mental representations. Below are examples of sentences generated by a subject, with the identified senses of the verb *stand* indicated in brackets:

(1) Don't just stand here. (be upright)

(2) I stand here waiting for my friend. (be upright)

(3) Stand back, give me some room. (move back)

(4) I can't stand the voice. (dislike)

(5) Stand up. (get up onto one's feet from another position)

(6) I stand in the classroom. (be upright)

(7) Why do you stand there? (be upright)

(8) The baby is able to stand very well. (be upright)

(9) I can't stand many difficult problems at the time. (tolerate)

(10) I can't stand waiting here all the time. (dislike)

3.1.3 Results and Discussion

Table 2 illustrates the frequency of specific senses provided by subjects in their first sentences. Consistent with the methodological approach in Gilquin and McMichael's research (2018), we focus on the top five senses that were most frequently produced, rather than presenting data for all identified senses. This selection assumes that the prototypical sense is likely to be among these five most frequently used senses.

Table 2. Five most frequent senses in first sentences (N=64)

	Sense	Example	Freq.	%
1	Get up onto your feet from another position	I stand up to answer the questions.	36	56.3
2	Be upright or on one's feet	Many students stand under the tree.	16	25.0
3	Dislike	I can't stand the noise when I go to bed.	3	4.7
4	Support	I will stand with you.	3	4.7
5	Represent	I think I will stand for my school.	2	3.1

As shown in sentences (1) to (10) and the data in Table 2, subjects generated a wide range of senses for the verb *stand*. Among these, the sense *"get up onto your feet from another position"* was notably privileged for the first sentences produced. This sense appeared 36 times, accounting for 56.3% of all first sentences, making it the most frequently produced sense. It occurred more than twice as often as the second most frequent sense, *"be upright or on one's feet"*, which appeared 16 times (25%). The other three senses—*"dislike"*, *"support"* and "*represent"* — occurred only three or two times each. These results suggest that the sense *"get up onto your feet from another position"* is predominant in the learners' mental representation.

But this finding contrasts with the prototype of the verb *stand* as defined by *the OALECD*, which lists *"be upright or on one's feet"* as the primary sense. According to the general principles of dictionary compilation, senses of a certain word are ordered in terms of their occurring frequency and prominence in usage (Williams, 1992). To further investigate this discrepancy, the frequency of all senses across all sentences was analyzed. The results for the five most frequent senses are illustrated in Table 3.

Table 3. Five most frequent senses across all sentences (N=640)

	Sense	Example	Freq.	%
1	Be upright or on one's feet	I stand all day in class.	221	34.5
2	Get up onto your feet from another position	We should stand up when the class begins.	188	29.8
3	Dislike	I couldn't stand that environment.	51	8.0
4	Support	I will stand up for you no matter what happens.	30	4.7
5	Insist, keep	I stand eating breakfast every day for my health.	25	3.9

Similarly, Table 3 clearly shows that a wide range of senses was produced, which confirmed that the subjects were devoted to the task rather than completed it randomly or carelessly. The senses *"get up onto your feet from another position"* and *"be upright or on one's feet"* remained the two most frequently produced, consistent with the results in Table 2. However, when all sentences were considered, a notable shift occurred: unlike the findings in Table 2, Table 3 shows that *"be upright or on one's feet"* emerged as the most frequently produced sense, appearing 221 times (34.5% of all sentences). This was followed by *"get up onto your feet from another position"*, which occurred 188 times (29.8%). The third and fourth most frequent senses, *"dislike"* (8%) and *"support"* (4.7%) remained consistent with the previous results. However, the fifth sense shifted from *"represent"* to *"insist, keep"*, which accounted for 3.9% of the responses. This latter sense, although not listed in the *OALECD*, reflects a usage pattern observed in the subjects' data, as illustrated in the sentence *"I stand eating breakfast every day for my health"*, which could be interpreted as the sense *"keep, insist"*.

Further insight was provided by a proportion test for frequency percentages of the top two senses in Table 3, conducted using R (R Core Team, 2013). This test assesses whether there is a significant difference between the two proportions in independent groups. The results revealed no significant difference between the proportions of *"be upright or on one's feet"* and *"get up onto your feet from another position"* ($p > 0.05$), suggesting that both senses are equally weighted in subjects' mental representation. Consequently, both of them could be identified as prototypes of verb *stand* for native Chinese learners of English.

To conclude, the data from the sentence generation task cannot provide convergent evidence on which sense could be the prototype of the verb *stand*. In view of the frequency of the senses in the first sentences, the sense 'get up onto your feet from another position' could be treated as the prototype. However, when all sentences were taken into account, both *"be upright or on one's feet"* and *"get up onto your feet from another position"* could be candidates for the prototypes of the verb *stand*.

3.2 Experiment 2: Sentence Sorting Task

3.2.1 Rationale

In cognitive linguistics, a polysemy is viewed as an example of linguistic categorization, making sorting tasks a natural choice to address the issue of mental representation (Taylor, 2003; Gries, 2019). Sandra and Rice (1995) used this type of task to investigate the nature of lexical network of the prepositions *at*, *in* and *on* by asking subjects to sort 20 sentences for each preposition. Similarly, Ramsey (2022) employed sentence-sorting tasks to get insight into the issue of individual differences in mental representation. In his research, the subjects were asked to sort a set of 36 sentences containing one of polysemous prepositions *over*, *under*, *above* and *below*. Both studies

demonstrated the validity that any distinctions subjects made in their sorting tasks may be a straightforward reflection of the way how they made sense distinctions at the level of mental representation. Based on these findings, the current experiment used a sorting task to investigate the prototype of the verb *stand*. In addition, Rice (1996) found that due to the magnet effect of prototypical sense, groups formed by subjects housing the prototypical sense tended to be relatively larger than groups containing non-prototypical senses. Building on this insight, we hypothesized that groups formed by subjects containing the sense *"be upright or on one's feet"* would have more members than groups without this sense, as this sense is defined as the prototype of the verb *stand* in the *OALECD*.

3.2.2 Method

Subjects. A total of 74 undergraduate students participated in this experiment. All subjects were native-speakers of Chinese, learning English as a foreign language at Taishan University, a comprehensive state-owned institution. They were all majoring in education management and required to take English as a part of their Bachelor's Degree requirements. Detailed demographic information about subjects is presented in Table 4.

Table 4. The information about subjects in sentence sorting task

Task	Number of subjects	Major of subjects	Number of collected answer sheets	Number of males	Number of females	Number of discarded answer sheet	Number of Valuable answer sheet
Sentence sorting	74	Education management	74	35	39	3	71

Materials. The stimulus sentences were created following the paradigm adopted in the sentence sorting tasks by Rice (1996) and Lopukhina et al. (2018). All stimulus sentences were extracted from the *OALECD* which is compiled particularly for native Chinese learners of English. In order to cover the wide range of senses, all 16 senses listed in the *OALECD* under the entry of verb *stand* were represented, with two sentences extracted for each sense. This methodology can solve the problem of limited contexts which may not be prototypical representatives of a sense and therefore could affect subjects' responses (Lopukhina et al., 2018). All stimulus sentences were edited to have almost the same length and were printed on A4 paper in random order. Special attention was given to ensure that the two sentences corresponding to the same sense were separated by at least four other sentences featuring different senses of *stand*. In each stimulus sentence, the target word *stand* was printed in upper case, while the remaining text in sentence case.

Procedure. Before conducting the main experiment, a group of 20 students who did not attend the main experiment was invited to evaluate the familiarity of the stimulus materials. Using a seven-point Likert scale (1=extremely unfamiliar, 7 = extremely familiar), the students rated each sentence to ensure its applicability for the sorting task. The results showed high familiarity with the stimulus sentences ($m > 5.8$), confirming their suitability for use in the main experiment.

The main experiment was conducted by the researchers with the assistance of English teacher who was managing the subjects' class. The task was completed in a classroom setting using pens and paper. At the start, each subject was randomly assigned a sheet of stimulus material. Subjects were instructed to sort the sentences into one or more groups based on the meaning of the capitalized word *STAND* in each sentence. Sentences with the same perceived word sense of *stand* were to be sorted into the same group. Following the guidelines of of Lopukhina et al. (2018), the number of groups was not limited and subjects were allowed to group all sentences into one group or assign each sentence to its own group. Besides, subjects were also permitted to complete the task at their own speed to accurately capture both semantic overlaps and distinctions between the senses of the verb *stand*.

Subjects were further required to label each group they created with a meaning that is shared by all the members in that group. They had to sort all stimuli before they could submit their responses.

Data collection. A total of 74 responses were collected. Upon initial examination, three responses were excluded because the subjects failed to sort all the sentences into groups as instructed. Consequently, 71 valid responses were retained for analysis. Then the number of groups formed by each subject and the number of sentences in each group were counted to examine whether the group containing the sense *'be upright'* was the largest.

3.2.3 Results and Discussion

Table 5. Number of members for the top five largest groups (N=71)

	Meaning of Group	Total Number of Member	Average Number of Member
1	Be upright	584	8.2
2	Keep, insist	288	4.1
3	Tolerate	270	3.8
4	At a level or height	146	2.1
5	In a place	135	1.9

Table 5 presents the top five largest groups based on the average number of members in each group. As is evidently shown in Table 5, the group labeled with the sense *"be upright"* by subjects ranked first, with a total of 584 members and an average of 8.2 members per group. This was twice as many group members on average as the group defined with the sense *"keep, insist"*, which ranked second with an average of 4.1 members per group. The third position was occupied by the group labeled with the sense *"tolerate"*, which contained 270 members and had an average of 3.8 members per group, slightly lower than the group in the second position. The fourth and fifth

positions were held by the groups associated with the sense *"at a level or height"* (2.1 members on average) and *"in a place"* (1.9 members on average), respectively. These results strongly indicate that the group containing the sense *"be upright"* was the largest, corroborating Rice's (1996) argument that the prototypes exhibit a magnet effect, attracting a higher number of members into their semantic space.

Upon a closer examination of Table 5, an intriguing finding emerged: the sense *"get up onto your feet from another position"*, identified as one of the top five most frequent senses occurring in the sentence generation task, was absent in the sorting task. This shows that no subjects recognized this sense during the sorting task, even though two stimulus sentences (Sentences 13 and 14) represented this sense.

A further observation of the specific members in the groups formed by subjects revealed a surprising pattern. Up to 90% of subjects grouped Sentences 13 and 14 together with Sentences 11 and 12, where the verb *stand* conveys the sense *"be upright or on one's feet"*. These four sentences were frequently grouped together into a single group labelled as *"be upright"*. This indicates that subjects make no distinctions between the senses *"be upright or on one's feet"* and *"get up onto your feet from another position"* at the level of mental representation. Below are examples of stimulus sentences numbered from 11 to 14:

(11) She was too weak to STAND.

(12) We all STOOD around in the corridor waiting.

(13) Everyone STOOD when the president came in.

(14) We STOOD up in order to get a better view.

To sum up, the data from the sentence sorting task show that subjects did not distinguish the sense *"be upright"* from the sense *"get up from another position"* despite these being defined as distinct senses in the *OALECD*. *According to the dictionary,* the former sense characterizes *"a state of standing"*, while the latter focuses on *"an action of standing"*. However, the sense *"be upright"* exhibited a stronger magnet effect (Rice, 1996), attracting an average pf 8.2 members per group to form the largest semantic cluster. Based on these findings, the sense *"be upright or on one's feet"* emerges as a candidate for the prototype of the verb *stand*.

4. General Discussion

Taken together, the two tasks did not provide converging evidence on the issue of prototypes of English verb *stand* for native Chinese learners of English. The sense "*get up onto one's feet from another position"* was the most frequently elicited sense when only the first sentences produced by subjects produced in the sentence generation task were taken into account. However, the sense *"be upright or on one's feet"* could also be considered as a central sense if all the sentences produced by subjects in the sentence generation task and the largest group formed by each subject in the sentence sorting task were considered.

More surprising is that the diverging results even occurred even in the first experiment where the only difference was the range of sentences taken into account when computing the frequency of senses. As previously mentioned, the most frequently used sense was *"get onto one's feet from another position"* when considering the first sentences produced by subjects, but the sense *"be upright or on one's feet"* became more central when taking all sentences into account.

At first glance, this may lead us toward questioning the hypothesis that prototypical senses are usually the ones that first come to mind and are firstly produced in psychological priming (Dobrić, 2015; Gilquin, 2006). However, a closer examination of the exact content of the first sentences students produced shows that the majority were variants of the sentence "Stand up", such as "Stand up, please" or "Please stand up" with the single word "please" added to its head or end. These sentences occurred up to 31 times out of the first 64 sentences, accounting for almost half of the responses. This was surprising enough that we interviewed 12 subjects who produced this type of sentence to investigate the reasons behind this. Nine of them reported being greatly affected by the traditional way in which their class starts. It is a well-established tradition in Chinese classrooms for the class monitor to issue the order 'stand up,' after which the students stand up and greet the teacher. In these contexts, students are frequently exposed to the phrase "stand up", leading them to store it as a whole unit at the surface. In other words, the repetitive exposure to this phrase in Chinese classrooms has led to its entrenchment in students' minds. Thus, we would rather claim that this finding confirms the idea that the repeated use is the driving force of entrenchment (Langacker, 1987; Stefanowitsch & Flach, 2016). Schmid (2000) similarly claims that entrenchment in memory could be instantiated by frequency of use in text. This research provides empirical evidence that the more entrenched senses are in language learners' mental representations, the more likely it is to come to mind earlier.

Additionally, the findings from both tasks provide more evidence for the view that it is both plausible and reasonable to seek converging evidence when identifying the prototype of a polysemous word. Various criteria have been put forward to identify and evaluate the semantic prototypicality of a lexical category, such as ease of elicitation, earliest acquisition, historical origin and patterns in L2 use (Geeraerts, 2010; Gilquin & McMichael, 2018; Rice, 1996; Taylor, 2014; Tyler and Evans, 2003). However, this research suggests that results obtained from a single criterion may not be reliable. The idea is also supported by Gries (2006), who claims that it is more a rule than an exception for an inventory of criteria to be in conflicts. In other words, prototypical effects can be evaluated from diverse dimension, such as ease of elicitation, the magnet effect and synchronic language use, which may lead to divergent results (Gilquin & McMichael, 2018; Rice, 1996). From this perspective, it seems it is a natural choice to employ different criteria when searching for the central sense of a lexical category. Such work was pioneered by Dobrić (2015), who evaluated the prototype of the verb *look* by examining its frequency of use, contextual saliency and inter-category similarity. The evidence obtained through such triangulation of data

can complement each other in identifying the prototype (Schönefeld, 1999).

However, converging evidence should not necessarily point in the same direction. In the present experiments, we found that there is more than one prototype of verb *stand* for English L2 learners, even though we examined two criteria, namely ease of elicitation and the magnet effect. This finding is echoed in other literature on the prototypicality of lexical category. For example, Giquin and McMichael (2018) found it difficult to obtain a converging result on the prototypicality of preposition *through* despite examining five criteria. Some criteria showed that the intuition-based prototype of *through* held special status, while other criteria, such as patterns in L2 use, demonstrated that the use of *through* as an instrumental prepositional phrase was easier for L2 learners to acquire. These findings further support the idea that prototypicality itself could be a prototypical concept, with some prototypes existing at different levels (Geeraerts, 2010; Dobrić, 2015). Thus, our research is in line with the work of Rice (1996), who found that there may be more than one prototypes for a polysemous word.

5. Conclusion

It is widely assumed that the prototype of a polysemy plays a central role in the organization of lexical network. However, most of the available studies have only delved into this notion from the perspective of English native speakers without giving enough attention to English L2 speakers and learners. With this gap in mind, this study aimed to identify the prototypical sense of the English verb *stand* among native Chinese learners of English. Two experiments were conducted in succession, based on the prototype criteria of ease of elicitation and the magnet effect. The results demonstrated that both senses 'be upright or on one's feet' and 'get onto one's feet from another position' could be potential prototypes of the English verb *stand* among English L2 learners. Although we didn't achieve the full convergence on the prototypes of the verb *stand*, this research sheds some lights on the notion of prototypicality. Firstly, the divergent results suggest that prototypicality may be better understood as a multi-faceted notion. Additionally, the research reveals that triangular evidence from combined methods is a more reliable way to identify the prototype of a word rather than based on a single criterion. More importantly, the L2 learners' prototype of a polysemy may be determined by the degree of their exposure to a given sense. Future research should investigate this issue by applying a broader range of criteria to L2 learners.

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Authors' contributions

Dr. Jianwei Wang and Dr. Corazon D. Ciriaco jointly contributed to the study design and manuscript revision. Dr. Jianwei Wang was responsible for data collection, analysis, and drafting the manuscript. Dr. Corazon D. Ciriaco provided critical revisions to enhance the content. Both authors read and approved the final manuscript and agreed to be accountable for all aspects of the work.

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