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Acquisition of the Prototypical and Non-prototypical Meanings of *over* by Chinese EFL Learners: Evidence from a Verb Production Task

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Abstract: Construction prototypicality has long attracted scholarly attention, yet research on the acquisition of such prototypicality remains limited. This study investigates the prototypicality of the senses of over within the *V(n) over XXX* construction. A verb production task was used to elicit verb production from participants, and qualitative analysis was performed to explore how the semantic prototypicality of over affects verb production. The experimental results show that L2 learners' mental representations of construction prototypicality diverge from those of native speakers. For both high- and intermediate-proficiency Chinese EFL learners, the acquisition of over's prototypical senses lags behind that of some of its non-prototypical senses; While there was no significant difference between the two groups in acquiring the prototypical sense, their acquisition of non-prototypical senses was broadly similar; nevertheless, the advanced learners exhibited more fine-grained acquisition than the intermediate learners.

Keywords: Prototypicality Hypothesis, Verb Production Task

1. Introduction

The acquisition of prototypicality has attracted increasing attention in recent years (e.g., Kim et al., 2025; Siew & Guru, 2023; Hwang & Kim, 2026). The Prototype Hypothesis (Ellis, 2014b) posits that, like native speakers, second language (L2) learners acquire prototypical meanings more easily than non-prototypical ones. Regarding the L2 acquisition of over, existing studies have predominantly focused on the collocations of the preposition *over* with succeeding nouns to investigate the acquisition of its semantic prototypicality, while less attention has been paid to exploring this from the perspective of collocations with verbs. Therefore, it is particularly necessary to further examine whether the acquisition of the prototypical and non-prototypical meanings of *over* conforms to the Prototype Hypothesis based on verb production.

2. Literature Review

2.1 The Prototypicality Hypothesis

Human beings possess the capacity for categorization. A category is a hierarchical structure in which some members are more representative than others. According to categorization theory (Rosch & Mervis, 1975; Rosch et al., 1976), a prototype is the most representative exemplar; it resembles many members within its category but has little similarity to members of other categories. Non-prototypical members of a category are less representative. When people are asked to list category members, prototypical members are mentioned more frequently (Rosch & Mervis, 1975). Even if prototypical members have never been encountered before, they can be recognized rapidly (Posner & Keele, 1968, 1970). The prototypicality hypothesis holds that forms with higher prototypicality are acquired more easily, whereas those with lower prototypicality are harder to acquire (Ellis, 2014b). Cai & Wang (2022) found that both within-language priming of locative constructions and cross-linguistic priming from the L1 to the L2 are affected by the prototypicality of L1 constructions. Jiang (2020) found that L2 Chinese learners' acquisition of the *ba* construction is affected by the prototypicality of thematic relations; Ijaz (1986), drawing on categorization theory, found that advanced ESL learners from different L1 backgrounds (e.g., German, Urdu) comprehend the prototypical senses of spatial prepositions in a way closer to native speakers than they do the non-prototypical senses. In addition, Ma (2007) and Li & Cai (2008) found that Chinese EFL learners acquire the core senses of spatial prepositions better than the peripheral senses. It

is thus evident that construction prototypicality, thematic-relation prototypicality, and spatial-preposition prototypicality all affect the acquisition of prototypical meanings. However, *over* can function as both a preposition and an adverb, and its prepositional and adverbial senses are closely related; existing studies have mostly focused on its prepositional use (Ma, 2007; Li & Cai, 2008; Ijaz, 1986; Ellis, 2014b), and examining only its prepositional use cannot fully reflect learners' actual acquisition of *over.* Whether the semantic prototypicality of *over* affects its acquisition remains to be investigated in depth. Using a verb production task to examine the *V(n) over XXX* construction can better capture both the prepositional and adverbial uses of *over.*

2.2 Prototypicality Analysis of the Senses of *over*

Langacker (1987) put forward four criteria to identify prototypical meanings: first, the meaning appears earliest in language acquisition; second, it occupies a central position within the semantic network; third, it bears semantic distinctions from other related prepositions; fourth, it has strong predictive power for grammar.

Scholars hold debates over the protoscene of *over.* Lakoff (1987) and Kreitzer (1997) proposed reasonable yet conflicting definitions. Lakoff defined the prototypical sense of *over* as "above and across", whereas Kreitzer argued that its prototypical sense is merely "above". Taylor integrated their standpoints and pointed out that at the conceptual level, numerous static spatial points of "above" can be integrated to form the dynamic meaning of "above and across". Therefore, the present study does not strictly distinguish between these two readings and treats both as the prototypical senses of *over.* Within this spatial relation, the trajector and landmark may or may not be in contact.

A schematic illustration of the prototypical sense of *over* is shown in Figure 1. Motion verbs such as "jump" and "leap" often collocate with this prototypical sense, as in the example: "The cat jumped over the hill".

Langacker (1987) proposed four criteria for identifying prototypical meanings: first, the meaning appears earliest in language acquisition; second, it occupies a central position in the semantic network; third, it is semantically distinguished from other related prepositions; and fourth, it has strong predictive power for grammar. Regarding the prototypical meaning (protoscene) of over, Lakoff (1987) and Kreitzer (1997) both offered reasonable but conflicting definitions: the former holds it to be the "above and across" sense, whereas the latter holds it to be the "above" sense. Taylor integrated the two views, arguing that at the conceptual level, numerous static spatial points of "above" can be integrated into the dynamic meaning of "above and across". The present study therefore does not distinguish between these two readings and treats both as prototypical meanings; moreover, in the spatial relation denoted by *over,* the trajector and the landmark may or may not be in contact.

A schematic example of the prototypical meaning of over is shown in Figure 1. The verbs collocating with this prototypical meaning are mostly motion verbs such as *jump* and *leap.*

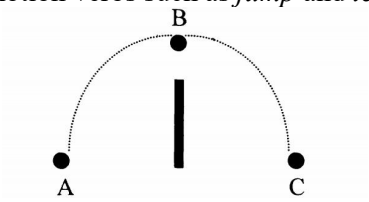


Figure 1. Schematization of Sentences of the Type *The Cat Jumped over the Wall.*

Tyler & Evans (2001) systematically defined the prototypical meaning and non-prototypical meanings of *over* by employing cognitive principles regarding the relationship between language and embodied experience within cognitive linguistics, such as perceptual analysis and reconceptualization, spatial perspective, and inferential strategies. This analytical approach is worth adopting in the present study. However, based on the experimental data, this study aligns with Lakoff's position: the present study considers the typical sense of *over* to be *above-and-across.* Therefore, drawing upon the semantic network proposed by Tyler & Evans (2001), this study has modified the meaning schema of *over,* as illustrated in Figure 2. In this figure, the prototypical meaning of *over* is *above-and-across*, while the non-prototypical meanings are categorized into *trajectory extensions, covering, examining, up cluster, and reflexive.*

It is worth noting that most studies on L2 learners' acquisition of over discuss its usage as a preposition by focusing on the nouns following it; relatively few studies have examined the acquisition of its meanings through verb

production. (When *over* collocates with a verb, it can function either as a preposition or as an adverb. For example: (1) *He flew over the river,* where *over* functions as a preposition; (2) He flew over, where *over* functions as an adverb. The meanings of the preposition and the adverb are closely related.) Based on the prototypicality of over's meanings, this study attempts to investigate the acquisition of the semantic prototypicality of over—whether functioning as a preposition or an adverb—by examining the verb production in the V(n) over XXX construction, and aims to address the following research questions:Against this research backdrop, the current study adopts the prototypicality of over' s meanings as the framework to examine learners' verb production within the V+(NP)+over XXX construction. It addresses the following two research questions:

1. What characteristics are manifested in Chinese EFL learners' acquisition of the prototypical and non-prototypical senses of *over*?
2. Is Chinese EFL learners' acquisition of the prototypical and non-prototypical senses of *over* correlates with their language proficiency?

This study uses native speakers' production data as the control group to investigate Chinese EFL learners' mastery of the prototypical and non-prototypical senses of *over*. According to the prototypicality hypothesis, L2 learners acquire prototypical senses more easily, while non-prototypical senses are more difficult to acquire. Hence, this research hypothesizes that L2 learners produce verbs collocating with the prototypical senses of *over* at higher frequencies, whereas verbs corresponding to the non-prototypical senses of *over* are produced less frequently.

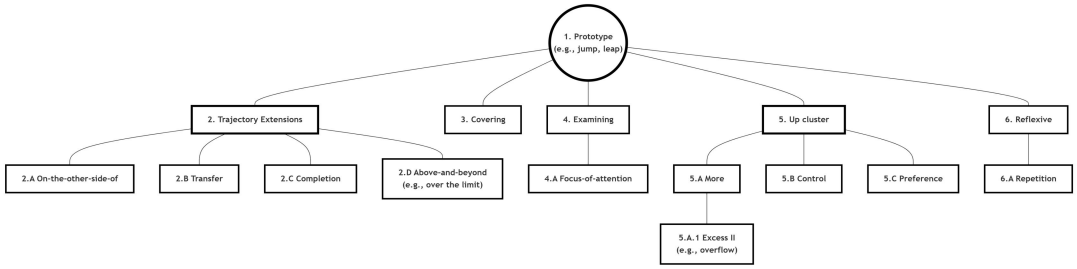


Figure 2. Semantic network of *over*. (Adapted from Tyler & Evans, 2001)

3. Research Design

3.1 Participants

Three groups of participants with different language backgrounds and proficiency levels were recruited to participate in the present study. The first group consisted of 44 postgraduate students (aged 22–35; 4 males and 40 females) majoring in English at a comprehensive university in China. These participants have received systematic and professional English training for a long time, with solid English foundation and high language proficiency, and were classified as high-proficiency EFL learners in this study. The second group included 36 first-year undergraduate non-English majors (aged 22–35; 4 males and 40 females). Having received standard middle and high school English education and initial college English teaching, these learners represented intermediate-level EFL learners. The third group comprised 37 native English speakers whose IP addresses were located in the United Kingdom and the United States. All native participants grew up in a natural English language environment and took English as their first language, serving as the baseline control group. All participants (aged 18–35; 13 males and 24 females) involved in the experiment had received or were receiving formal university education. In addition, all participants volunteered to take part in the verb production task, had no history of language or cognitive disorders, and received appropriate compensation for their participation.

3.2 Experimental Procedure

Data were collected through a verbal free-association task, a classic and well-validated experimental paradigm in cognitive psychology. This paradigm has been widely adopted in previous studies to elicit lexical items that are closely and semantically associated with a specific conceptual or syntactic category (Battig & Montague, 1969; Rosch & Mervis, 1975), making it suitable for exploring learners' semantic representation and collocational knowledge of the *over.* In the present study, Chinese EFL learners at high and

intermediate proficiency levels completed the free-association test independently via the E-Prime experimental software, which ensures standardized stimulus presentation and accurate response recording. In contrast, native English speakers finished the same experimental task through the Prolific online research platform (https://www.prolific.co), a high-quality participant recruitment and data collection platform. Prolific is widely trusted by academic institutions worldwide for its rigorous participant screening mechanism and reliable data quality.

The entire experimental procedure was precisely programmed and preset on the Gorilla experimental platform to ensure consistent task instructions, operational procedures, and time constraints for all participants across different groups. In addition, Prolific is equipped with systematic built-in participant verification functions and duplicate screening mechanisms, which effectively prevented repeated participation, invalid responses, and data contamination caused by the same participant taking the experiment multiple times.

Participants were required to fill in as many appropriate verbs as possible in the verb slot of the V(n) over XXX construction within two minutes. The time limit was determined based on a pilot study: one minute was too short for participants to produce a sufficient number of verbs, whereas three minutes were too long, as the amount of production no longer increased noticeably; two minutes was therefore adopted. To balance the sample sizes across groups, the raw data were trimmed: the native-speaker group originally comprised 37 participants, and 1 data set was randomly removed, leaving 36; the high-proficiency group originally comprised 44 participants, and 8 data sets were randomly removed, leaving 36; the intermediate-proficiency group remained unchanged at 36. Ultimately, the production data of 36 participants were retained for each of the three groups.

Because verb inflections such as tense and number were not controlled in the task, all produced verbs from each group were first submitted to lemmatization. The frequencies of verbs produced by each group were then computed.

4. Results and Discussion of Verb Production

4.1 Acquisition Patterns of Prototypical and Non-Prototypical Senses of over among Chinese EFL Learners

This study adopted a verb production task to systematically examine the quantity, type and semantic distribution features of verbs produced by native English speakers, high-proficiency and intermediate-proficiency Chinese EFL learners within the V+(NP)+over construction.Native-English speakers produced 366 verb tokens, representing 62 verb types. High-proficiency learners produced 233 verb tokens across 60 verb types, while intermediate-proficiency learners generated 170 verb tokens with 35 verb types. Table-1 illustrates the frequency distribution of the top-20 verbs for each participant group.

Table 1. Top 20 Verbs by Production Frequency in the Three Groups

Native	frequency	Advanced	frequency	Intermediate	frequency
jump	34	look	21	think	21
run	29	take	15	look	19
walk	23	think	15	go	19
leap	19	go	14	take	18
drive	17	walk	12	come	15
look	14	fly	12	run	14
talk	13	come	11	turn	12
skip	12	turn	9	walk	8
fall	11	jump	9	fly	7
come	11	hand	8	pass	6
take	11	run	7	get	6
go	11	pull	7	jump	5
fly	10	get	7	pull	3
swim	10	cross	6	be	3
trip	9	watch	5	climb	3
speak	8	speak	5	swim	2

yell	8	pass	5	move	2
hop	7	fall	5	hang	2
think	7	win	4	cross	2
cry	6	lie	3	check	2
dance	6	hang	3	chat	2

Based on the production distribution of native speakers in Table 1, the most typical verb corresponding to the prototypical sense of *over* is *jump*, with a production frequency of 34, which is significantly higher than that of other verbs. In addition to *jump*, verbs such as *run* (29), *walk* (23), *leap* (19), *drive* (17), *skip* (12), *fly* (10), *trip* (9), *hop* (7), and *dance* (6) are also frequently collocated with the prototypical sense of *over*, though their frequencies are all lower than that of *jump*. In contrast, the production frequencies of verbs corresponding to the non-prototypical senses of *over* are generally lower. For instance, verbs corresponding to the trajectory extensions sense include *come* (11); verbs corresponding to the focus-of-attention sense include *look* (14), *go*(11), *think* (7), and *cry* (6); verbs corresponding to the reflexive-repetition sense include fall (11) and *trip* (9); and verbs corresponding to the up-cluster sense include *take* (11)

In addition, it can also be seen from Table 1 that Chinese EFL learners' production distribution exhibits features different from those of native speakers: most of the high-frequency verbs correspond to the non-prototypical meanings of *over*. The four most frequently produced verbs by both the intermediate- and high-proficiency Chinese EFL learners were *look* (high-proficiency 21 / intermediate 19), *take* (high-proficiency 15 / intermediate 18), *think* (high-proficiency 15 / intermediate 21), and *go* (high-proficiency 14 / intermediate 19), with differences only in the ranking of the verbs. These verbs all correspond to the non-prototypical meanings of *over* (such as focus of attention and up-cluster). Next, verbs such as *walk* (high 12 / intermediate 8), *fly* (high 12 / intermediate 7), and *jump* (high 9 / intermediate 5) had the next highest production frequencies and correspond to the prototypical meaning of *over*. In addition, among the Chinese EFL learner groups, the gap in verb production frequency was smaller than the range of verb frequency variation among native speakers. It can thus be seen that, on the one hand, no verb corresponding to the prototypical meaning of *over* had an extremely high proportion or showed an obvious gradient with other verbs; on the other hand, the verbs corresponding to other non-prototypical meanings of *over* were distributed in a scattered manner. The high-frequency verbs corresponding to the non-prototypical meanings of *over* were also limited to certain common fixed collocations (such as *look over*, *think over*, etc.). This research conclusion is inconsistent with the results of related studies that examined the acquisition of *over* from the perspective of nouns following *over*. Ma (2007) and Ijaz (1986) found that L2 learners' acquisition of prototypical meanings is better than that of non-prototypical meanings. Possible reasons for this discrepancy are as follows: First, Chinese students are in a non-naturalistic L2 acquisition environment, and their English learning is affected by pressure from various examinations such as the Zhongkao, Gaokao, and College English Test (CET-4/6). Under an examination-oriented teaching model, teachers' deliberate emphasis on non-prototypical meanings and students' attentional learning may have contributed to learners' better mastery of non-prototypical meanings. Second, repeated input of fixed exemplars such as *look over NP, think over NP,* and *go over NP* helps intermediate- and high-proficiency learners produce verbs such as *watch* and *check* through semantic association (Römer et al., 2014). Finally, Chinese English textbooks and teachers do not explicitly explain to learners the prototypical meaning of *over*, that is, the spatial meaning of "above and across" shown in Figure 2.

It can be seen that, for native speakers, the production frequency of verbs corresponding to the prototypical sense of *over* is the highest, followed by that of non-prototypical verbs, with a distinct difference between the two. To a certain extent, this distribution pattern indicates that the prototypical sense of *over* possesses higher cognitive salience in native speakers' mental lexicon and is more easily prioritized for activation, whereas the cognitive salience of non-prototypical senses is relatively lower.

In summary, with respect to the semantic prototypicality of over, L2 learners' mental representations are relatively vague or noisy (Ellis, 2022; Tachihara & Goldberg, 2020).

Limited usage experience makes it difficult for L2 learners to reach native-like depth and accuracy in their command of the language. In sum, the semantic prototypicality of prepositions is not the sole core factor determining the difficulty of L2 acquisition. In non-naturalistic acquisition environments, explicit instruction, input frequency, and learners' attentional mechanisms may reshape the acquisition order predicted by prototypicality, making the acquisition of some non-prototypical meanings significantly better than that of prototypical meanings.

4.2 The Relationship Between the Acquisition of Prototypical and Non-Prototypical Meanings of Prepositions and Language Proficiency

From the verb production data, both the high- and intermediate-proficiency Chinese EFL learners produced verbs corresponding to the prototypical meaning of *over*, such as *walk* (high-proficiency 12 / intermediate 8) and *fly* (12 / 7), which indicates that the two groups' production performance on the prototypical spatial meaning of over was overall similar.

Meanwhile, among the top 20 verbs by production frequency, the two groups shared a large number of verbs corresponding to non-prototypical meanings, including *look* (high 21 / intermediate 19), *think* (15 / 21), *go* (14 / 19), *take* (15 / 18), *hang* (3 / 2), *pull* (7 / 3), and *turn* (9 / 12), indicating that in such non-prototypical senses as focus of attention, up-cluster, and trajectory extension, the production performance of the high- and intermediate-proficiency learners was broadly comparable.

The two groups' similar production performance on the prototypical meaning and some non-prototypical meanings may be related to the time-limited task adopted in this study. This study employed a two-minute verb production task, in which participants could fully retrieve their lexical resources within the allotted time. Although the task imposed a time limit, this online production task is relatively close in nature to offline semantic tests, so the differences brought about by language proficiency were weakened to some extent, thereby narrowing the production gap between the two groups.

Even so, closer comparison still revealed subtle differentiation between the two groups in the production of non-prototypical verbs. The top 20 verbs produced by both groups were overall concentrated in the range of high-frequency common words, but the high-proficiency learners additionally produced verbs such as *hand* (8) and *win* (4), with *hand* corresponding to trajectory extension and *win* to the up class. *Hand* is often converted from a noun into a verb, while the construction *win over sb*. occurs at a relatively low frequency in daily language input. In addition, although the distribution of high-frequency verbs was relatively similar, the high- and intermediate-proficiency groups differed in the total amount and types of verb production (high-proficiency: 233 tokens, 60 types; intermediate: 170 tokens, 35 types); this also indicates that the high-proficiency learners had a richer overall production volume and verb types, and may produce more peripheral members with more varied types (e.g., *win, hand*). The finding that the high-proficiency group produced peripheral verbs such as *hand* and *win* echoes the conclusions of Kim et al. (2025): as L2 proficiency increases, the semantic network learners build around the target word becomes denser, but the activation of nodes within the semantic network is not automatically accessible.

The present study addresses the limitations of previous related research. A review of the existing literature shows that Ellis et al. (2011, 2013, 2014a, 2014b), Römer et al. (2014), and Ellis (2016a, 2016b) conducted extensive research on the semantics of polysemous words and construction acquisition, but rarely specifically explored the moderating effect of language proficiency on the acquisition of the prototypical and non-prototypical meanings of *over*. The present study indicates that the acquisition performance of prototypical and non-prototypical meanings may be influenced by the variable of L2 proficiency: For the less common peripheral members within non-prototypical senses, high-proficiency learners can retrieve them more easily, whereas intermediate-proficiency learners find this relatively difficult. The higher the language proficiency, the richer the accumulation of various members within the same semantic category may be.. The semantic categories of intermediate learners contain fewer peripheral members, whereas those of high-proficiency learners contain more. This suggests that when investigating the prototypical acquisition of

polysemous words, the moderating role of language proficiency should not be ignored. At the pedagogical level, the results also suggest that English teachers, when teaching learners at different proficiency levels, should not only explain high-frequency fixed collocations but also help learners build a complete semantic network, strengthen the connections among low-frequency verbs within the same semantic category, and reduce selective blind spots in semantic activation.

5. Conclusion

Based on the prototypicality hypothesis, this study adopted a timed verb production task with native speakers as the control group to examine the verb production of high- and intermediate-proficiency Chinese EFL learners in the V(n) over XXX construction. It explored the characteristics of Chinese EFL learners' acquisition of the prototypical and non-prototypical meanings of over, as well as the role of language proficiency in the acquisition of these two types of meaning.The main findings are as follows: First, the verb production patterns of native English speakers were consistent with the prototypicality hypothesis. The most frequently produced verb by native speakers was *jump*, which centrally corresponds to the spatial prototypical meaning of *over*; the production frequency of prototypical-meaning verbs was significantly higher than that of various non-prototypical-meaning verbs, reflecting the stronger cognitive salience of the prototypical meaning in native speakers' mental representations. Second, the acquisition patterns of Chinese EFL learners differed from the predictions of the prototypicality hypothesis. For both high- and intermediate-proficiency learners, most of the high-frequency verbs corresponded to non-prototypical meanings of *over*: verbs related to fixed collocations such as *look, take, think*, and *go* occupied the top positions in production, whereas verbs corresponding to the spatial prototypical meaning were produced at relatively lower frequencies. L2 learners did not develop a native-like prototypical salience effect; the gap in production frequency between prototypical- and non-prototypical-meaning verbs was smaller than that of native speakers, and their mental representations of the polysemy of *over* were relatively vague. This result differs from the conclusions of previous studies that examined the acquisition of *over* through nouns after verbs (Ijaz, 1986; Ma, 2007). The reasons may be as follows: Chinese learners are in a non-naturalistic L2 acquisition environment, and examination-oriented classroom teaching focuses on high-frequency fixed collocations such as *look over, think over,* and *go over*; high-frequency input and teachers' explicit attentional guidance enhanced the acquisition of non-prototypical meanings. In contrast, textbooks rarely explain the spatial protoscene of *over* in detail, resulting in insufficient input of the prototypical meaning and making it relatively harder to acquire. Third, the high- and intermediate-proficiency learners' acquisition of the prototypical meaning of *over* was broadly comparable, and their overall acquisition performance on non-prototypical senses such as focus of attention, up-cluster, and trajectory extension was also basically consistent. Both groups mainly produced high-frequency common verbs, but language proficiency may affect the construction of the L2 semantic network: high-proficiency learners had a denser semantic network and were able to produce more verbs than intermediate-proficiency learners. However, because this study adopted a timed (two-minute) verb production paradigm, which imposed less pressure on language processing, the production differences between the two groups were narrowed to some extent.

The theoretical contribution of this study lies in further enriching the prototypicality hypothesis. The study confirms that semantic prototypicality is not the sole factor determining the difficulty of L2 acquisition; in a non-naturalistic L2 learning environment, input frequency, explicit instruction, and learners' selective attention can change the acquisition order of prototypical and non-prototypical meanings, and non-prototypical meanings may even be acquired better than prototypical meanings. At the same time, this study supplements research on the acquisition of *over* from the new perspective of verb production, addressing the limitation that previous studies mostly focused only on prepositional *over* followed by nouns, and it also discusses the influence of language proficiency on acquisition.

At the pedagogical level, the results of this study have implications for English preposition teaching in China. Teachers should not merely focus on explaining high-frequency fixed phrases related to *over*; they should also clearly

explain the spatial protoscene of *over* to learners and help students build a complete semantic network centered on the prototypical meaning and extending outward level by level. At the same time, for learners at different proficiency levels, teachers should consciously train the semantic connections among low-frequency verbs within the same semantic category, and prevent learners from merely memorizing isolated phrases and failing to build systematic polysemy representations.

This study still has several limitations. First, this study analyzed semantic representations only from the perspective of verb production frequency and did not conduct fine-grained ratings of the semantic appropriateness of the produced verbs. Subsequent research could combine production accuracy to comprehensively assess learners' mastery of the various senses of *over* and further explore the internal mechanisms of prototypical acquisition of polysemous words. Second, this study did not consider cases in which *over* is followed by nouns, and therefore could not comprehensively examine some of the non-prototypical meanings of *over*.

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