

## Research Article

# The Paradigmatic and Syntagmatic Priming Effect of Part of Speech Representation

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Part of speech feature is the representation between syntactic morphology and semantic category. Priming effect experiment can test the correlation between the parts of speech feature and the lexical processing process. This article puts forward part of speech representation paradigmatic and syntagmatic effect hypotheses. The experiments applied the design pattern of 3 (part of speech: noun by predicate by nonword) \* 2 (interval time: 50 by 500 milliseconds) \* 3 (English level: elementary by intermediate by advanced). Subjects are requested to make options of the part of speech of the target words. This study shows that when Chinese English learners extract an individual word, their choices are still influenced by part of speech factor without the restrictions of constructive syntagmatic semantic conditions. Both the syntagmatic and paradigmatic effects are verified. Part of speech priming effect intensity is influenced by the English acquisition levels of the subjects.

## 1. Introduction

Lexical knowledge is a vital part of speech processing and also is the major drive of speech production. The properties of parts of speech as a part of syntactic features also belong to lexical knowledge, which acts as one of the parameters representing language typological features. In the process of second language process, on the one hand, lexical information about part of speech is the main constituent to construct sentences. On the other hand, part of speech recognition and comprehension affect semantic processing and choice [1, 2]. That is, part of speech knowledge representation lies in between syntactic morphology and semantic category. Part of speech classification in light of grammatical categories originated from Indo-European languages. If investigated by the standard of English grammatical category, there are some ambiguities in part of speech differentiation in Mandarin Chinese [3]. One possible reason is the lack of salient morphological markers in Chinese language. Due to the linguistic differences in terms of part of speech between Mandarin Chinese (MC) and English, Chinese English learners' lexical cognition is apparently complex. The relevant language production errors

are typical and representative. The classification of words refers to a grammatical category, namely, the category of words reflected in the process of phrase combination. The disambiguation of multicategory words is one of the learning difficulties.

In light of word class markers, there are few explicit part of speech features in Chinese language while English is a language with obvious morphological features. If the differentiation of verb and noun is taken as an example, opposites are shown in English while inclusiveness is in Chinese [4, 5]. Noun use and verb use include each other in a lot of usages. For English and some other Indo-European languages, the classification of part of speech and syntactic components mutually affect each other. But in Chinese, there is no one-to-one correspondence between part of speech and syntactic elements. For example, noun and verb usages in Chinese language are differentiated by meaning rather than by form, while nominalization is typical in English. This typological difference between native language and target language leads to language transfer. Inflections and derivations are the main word formation methods in English, whereas in Chinese over 75% of words are formed through compounding [6]. The salience of morphological

features influences the development of specific morphological skills. In a comparative study, Ku and Anderson [7] observed that Taiwanese children had more advanced compound awareness than American children, whereas American children had more advanced derivational awareness than their Taiwanese counterparts.

Accordingly, some research questions appear. The semantic collocation involving multiword construction is a common linguistic feature. Noun and verb collocation and adjective and noun collocation are two common constructions in both English and MC. Are Chinese English language learners influenced by part of speech factor when they extract an individual word? If this process is influenced by syntactic factor, what is the mental representation in this lexical processing? As a main experimental psychological method, priming experiment can externalize the implicit effect and mental representation of the language comprehension and production produced by previous language contact. In this study, experiment procedures are designed according to the priming method and the syntactic and paradigmatic effect hypotheses are tested. In these experiments, we first verify whether the part of speech information is related to the lexical processing and then observe whether the part of speech information affects the choices regarding both syntagmatic relation and paradigmatic relations, or it only influences those in paradigmatic relation as mentioned by some researchers [8–10].

## 2. Background

*2.1. The Mental Representation of Lexical Processing.* Second language learners' mental lexical representation system is in a multilevel state. There are two systems in the bilingual speakers' mental lexicon. When one language system is activated and language production begins, the other language system will not be closed. Two systems can be activated at any time. Lexemes in mental lexicon consist of three levels, namely, phonology level, syntactic level, and semantic level. Accordingly, language learners' lexical knowledge also includes the three dimensions [11, 12]. Lexical access is achieved through the mutual effect of the two systems on three levels. The second language learners' mental lexicon is represented on the phonology level, semantic level, and syntactic level, respectively.

The representations of phonology, morphology, and semantics systems in second language acquisition lexical processing are not isolated from each other. Some researchers have built the models of second language acquisition lexical processing [13–15]. The model built by Grosjean explained what factors affect the information activated on different levels of the two systems [13]. Green in his model described how the second language learners control the process in which the two systems are activated to accomplish some language use tasks [14]. Characteristics of lexical process representation can be concluded as follows: first, in the language learners' internal acquisition system, lexical associations are encoded in the network of phonetic, semantic, and syntactic subcategorical representations. Second, in the bilingual cognition, the information of the

three dimensions (phonetic, semantic, and syntactic) is stored and processed in a holistic way. Third, semantic information and syntactic information are connected closely but the phonetic representation is relatively independent. The findings of previous study show that semantic information and phonetic information affects the lexical processing of language comprehension and production [15–20]. The study about effect of semantic information finds that it is the semantic features network of the two mental lexicon systems that support the second language output lexicon [21, 22]. Syntactic and morphological information on the third level may affect the lexical processing on a smaller scale. In theory, part of speech information is syntactic and morphological feature. In practical speech communication, the speakers' judgement of part of speech attributes in language comprehension and production may involve semantic elements.

Research on part of speech effect has been conducted in the cognitive science field. Some experimental psychological methods such as FMRI and ERP are adopted to compare the activation areas and reconstruction processes of concrete nouns and abstract nouns [23–25]. Several representative studies adopted experimental psychological method [8]. The results [10] show that part of speech representation can be externalized only in the lexical units involving [26] more than one free morpheme. When these lexical units are constructed, the syntactic constraints take effect.

*2.2. Priming Effect of Lexical Representation.* Words are categorized according to their specific functions in a sentence, which is one of the prescriptive methods describing syntactic features. Classification of part of speech marks the grammatical functions of lexical items. The grammatical method is adopted to describe the word use while the experimental psychological method is used to explore the lexical representation. Priming effect can investigate the lexical representation of second lexical processing. Some relevant studies have been conducted. For example, the lexical decision task is used to uncover word or conceptual representation [16]. The semantic categorization tasks are also used in second language lexical acquisition [27, 28]. In these experimental tasks, subjects are asked to estimate the semantic categories and semantic relations. The researchers calculate the subjects' response time to observe the semantic priming effect. Ferreira and Humphreys observed the effect of syntactic factor in the lexical and morphological processing [29]. The findings show that there is a "stress pattern" in a multiword frame influenced by syntactic constraints of part of speech category. In Schriefers' priming effect experiments, the grammatical gender categories, namely, masculine, feminine, and neutral, are proved to constrain the multiword production [30]. Some previous experimental studies proved the internal syntactic features constrain the production of multiword construction [8, 31]. Some other single-word production model proved that the lexical choice is driven by semantic information since the semantic representation on information level involves the concepts of speakers' expression and the semantic lexical items are activated [11].

Part of speech information affects the mental lexicon representation with the syntactic constraints. Some second language production models indicate that syntactic information and semantic information take effect simultaneously when the multiword strings are produced [32]. Lexical choices are syntactically driven. In the assumed sentence frame, word activation shows a horizontal linear trend and the activation is always affected by the adjacent words, reflecting a syntactic effect. When there is no influence of the semantic factors of adjacent words, can activated morphosyntactic features have a paradigmatic effect on lexical access? Can structural priming and semantic priming activated by part of speech information happen if there are no syntactic and semantic constraints between the priming items and target items? In theory, there is a “double direction” tendency. The recognition of words always takes place through decomposition. The dual-pathway models allow decomposition and direct whole-word access to occur in parallel [33–36]. Sinclair developed the “open-choice principle” and “idiom principle” and argues that the dual principles are parallel in language processing [37]. Wray noted that the analytical processing and holistic processing are parallel. Analytical processing is the decoding, reorganization, and construction of the language units on various levels including morphemes, lexical items, and clauses. Holistic processing is dependent on the prefabricated chunks stored in human brain and is a process of chunk storage [38] and extraction and organization [36]. Skehan advanced the dual mode system: the abstract principle-based mode and the concrete exemplar-based mode [39].

Most studies took Indo-European languages with prominent morphological features as research subjects. In this study, part of speech information involves both Chinese language and English language. The subjects’ native language is Mandarin Chinese. The general hypothesis in part of speech representation is reflected on two levels. On the one hand, the part of speech collocation information generated by the horizontal combination of words determines which word the speaker extracts and selects. On the other hand, part of speech information is one part of internal procedural knowledge and is independent of the syntagmatic relations. When phrases or sentences are produced, the influence of parts of speech information on combination process is observable. In this study, we attempt to see whether there is still a priming effect produced by part of speech information without those horizontal multiword combinations.

*2.3. Two Hypotheses of Syntagmatic and Paradigmatic Part of Speech Representation.* According to Saussure’s explanation of language mechanism, there are a variety of syntagms in language memory, and they differ in type and length. Language mechanism is the interaction of these syntagms in different dimensions. Language users’ choices are constrained by some principles of syntagmatic collocative relations, by inference, and also defined by syntactic semantic category linear relations.

In this study, the syntagmatic effect hypothesis refers to syntactic and semantic constraints on the combinative level between prime words and target words. We tend to observe

whether the subjects’ judgements are influenced by these constraints. The paradigmatic effect refers to the tendency that syntactic features and semantic features of the prime words and target words maintain consistency. As predicted, relevant syntactic rules and sense in mental storage can be activated when the subjects are asked to judge the part of speech of target words. Thus priming mechanism would take place and there would be a repetition tendency.

The differences of parts of speech attributes between English and Mandarin Chinese also affect syntagmatic effect and paradigmatic effect. In English and other Indo-European languages, the part of speech and syntactic constituents are different aspects of one problem while in Chinese languages part of speech information and syntactic constituents are not in one-to-one correspondence. The morphological markers are not salient in Mandarin Chinese. The semantic-pragmatic categories are relatively certain. The syntactic positions of words are complex, which is highly affected by semantic information and the syntactic restrictions. In contrast, the role of part of speech information in English matches up with syntactic constraints and different part of speech take different roles in a sentence. As a result, second language learners with Chinese as mother tongue are predicted to be affected by a stronger syntagmatic effect.

### 3. Research Questions and Hypotheses

#### 3.1. Hypotheses

*3.1.1. Hypothesis One: Syntagmatic and Paradigmatic Effect Hypotheses.* In experiment one, the prime and target words are both nouns having in common as OBJECT. When the prime and target words are both verbs, their common feature is EVENT. In experiment two, the verb prime words are replaced by adjectives. We intend to remove the syntactic repetition of prime word and target word but maintain the semantic association. The concrete nouns are replaced by abstract nouns in order to observe the possible effect when prime word and target word refer to the heterogenous things.

Our hypothesis is that both syntagmatic and paradigmatic effects exist. That is, the subjects’ judgements on part of speech category of target words are consistent with those of prime words. There is a syntagmatic effect of noun-verb collocation and adjective-noun collocation. Due to the impact of syntagmatic effect, when the prime word is concrete noun, the subjects have the most salient tendency to judge the part of speech of the target word as a verb. Due to the impact of paradigmatic effect, when the prime word is a verb, the subjects have the highest agreement rate that the target word is a verb. Affected by syntagmatic effect, when the prime word is an abstract noun, the subjects tend to judge target word as a verb but the tendency is lower than the condition when prime word is a concrete noun. Affected by syntagmatic effect, when the prime word is an adjective predicate, the subjects tend to judge target word as a noun.

*3.1.2. Hypothesis Two: Interval Time Effect Hypothesis.* The longer the interval between prime word and target word, the weaker the syntagmatic effect and the stronger the

paradigmatic effect. That indicates the consistency of prime word and target word part of speech choice is higher.

**3.1.3. Hypothesis Three: English Proficiency Effect Hypothesis.** The higher the subject's English proficiency is, the stronger the syntagmatic effect shown by part of speech judgement. The lower subject's English proficiency is, the stronger the paradigmatic effect shown by part of speech judgement. Repetition mechanism is involved in.

**3.2. Experiment Design.** Experiment one is a 3 (parts of speech: concrete noun by verb by nonword) \* 2 (interval time: 50 ms by 500 ms) \* 3 (English proficiency: low by intermediate by high) pattern. Part of speech and interval time are intragroup variables and English proficiency is intergroup variable. Experiment two is a 3 (parts of speech: abstract noun by verb by non-word) \* 2 (interval time: 50 ms by 500 ms) \* 3 (English proficiency: low by intermediate by high) pattern. Each subject finished two experiments consecutively. The dependent variable in both of the two experiments is the percentage of reaction time and judgement consistency of the corresponding part of speech.

**3.3. Experiment Participants.** Ninety subjects participated in these experiments. They are divided into three groups according to their English proficiency. There are thirty subjects in each group. Before participating in the experiments, they attended an English language proficiency test [40].

**3.4. Experiment Material.** Prime words consist of concrete noun, verb, and nonword in experiment one. In experiment two, the prime words consist of abstract noun, adjective, and nonword. There are ninety prime words (thirty nouns, thirty verbs or thirty adjectives, 30 nonwords). They are presented at random. The target words are homomorphic words such as *watch* or *play* which can be both noun and verb. All of the materials for activation in experiments one and two were not repeated. There are two conditions (50 ms and 500 ms) for interstimulus interval of each prime word. The presentation time of target word is 3000 ms.

**3.5. Experiment Procedures.** The experiment procedures are written by E-prime 2.0. The subjects are asked to judge the part of speech category of the target word 50 ms as well as 500 ms later after seeing the first prime word. They are asked to press N if they think it is noun and press V if it is verb. The reaction time is recorded automatically.

**3.6. Experiment Process.** All the subjects in different groups read the sentences with the target words as nouns as well as verbs respectively. Experiment one and two took turns to be operated. There was a simulation test before each of the formal experiment. The subjects have been familiar with the meaning and use of target words as well as the experiment procedures before coming to the formal experiments.

**3.7. Methods of Analysis.** The two dependent variables reaction time and judge consistency are calculated. Reaction time refers to the average reaction time under each of the conditions. The values that are bigger or smaller 2SD than the average ones are removed. Judge consistency refers to the number divided by the percentage of the total 30 target words in each condition that are judged to be the same part of speech category as those of prime words.

The two experiments are designed by 3 \* 2 \* 3 repeated ANOVA. Independent variables are part of speech (concrete noun, verb, and nonword in experiment one and abstract noun, adjective, and nonword in experiment two), and interval time is set as two ISI (50 ms and 500 ms) and English proficiency (low, medium, and high levels).

## 4. Results and Analysis

**4.1. Experiment Result.** The descriptive statistics in experiment one is in Table 1. In the condition of 50 ms interstimulus interval, the reaction time of noun priming is 1223 ms, and that of verb priming is 1237 ms (see experiment one, Table 1). The difference is not salient. In the condition of 500 ms interstimulus interval, the reaction time of noun priming is 876 ms and that of phrasal verb is 910 ms (see experiment one, Table 1). In the condition of 50 ms interstimulus interval, the subjects with low English proficiency present slower reaction time than those with higher proficiency. But in the condition of 500 ms interstimulus interval, the reaction time of both subjects with high proficiency (914 ms) and that of subjects with low proficiency (906 ms) is faster than that of subjects with medium proficiency (936 ms) (see experiment one, Table 1).

In this experiment, the prime words are concrete nouns or verbs. The ISI condition effect is salient for the reaction time of target words [ $F(1,87) = 57.42$ ,  $MSE = 11737$ ,  $p < 0.001$ ,  $\eta = 0.444$ ]. There is neither part of speech effect [ $F(1,87) = 1.28$ ,  $MSE = 15349$ ,  $p = 0.261$ ,  $\eta = 0.018$ ] nor intragroup proficiency effect [ $F(2,87) = .071$ ,  $MSE = 7520$ ,  $p = 0.536$ ,  $\eta = 0.017$ ]. But there is interactive effect of ISI \* part of speech [ $F(1,87) = 2.75$ ,  $MSE = 57478$ ,  $p = 0.100$ ,  $\eta = 0.037$ ] as well as the apparent ISI \* part of speech \* intragroup proficiency interactive effect [ $F(2,87) = 8.87$ ,  $MSE = 370794$ ,  $p < 0.001$ ,  $\eta = 0.198$ ].

In experiment one, in the condition of 50 ms, judgement consistency rate of noun as prime word of low proficiency group is 27.1% while that of verb as prime word is 27.4%. In the condition of 500 ms, judgement consistency rate of noun as prime word of low proficiency group is 29.5% while that of verb as prime word is 33.9%. The results show that judgement consistency rate of verb as prime word is higher indicating paradigmatic effect and interval time effect; in the condition of 50 ms, judgement consistency rate of noun as prime word of medium proficiency group is 32.4% while that of verb is 39.7% indicating that the paradigmatic effect is apparently higher than that of low proficiency group. But in the condition of 500 ms, there is not a salient intergroup difference.

The descriptive statistics in experiment two is in Table 1. The two parts of speech prime effects are calculated,

TABLE 1: Reaction time of part of speech prime effect and consistency rate in the condition of 50 ms and 500 ms.

Experiment	ISI condition	Part of speech	English proficiency			Average
			Low ( $N=30$ )	Medium ( $N=30$ )	High ( $N=30$ )	
Experiment one	50 ms	Concrete noun	1298 (271)	1248 (324)	1119 (315)	1223 (341)
		Verb	1277 (274)	1285 (397)	1143 (381)	1237 (348)
		Nonword	1202 (374)	1201 (324)	1222 (390)	1208 (314)
	500 ms	Concrete noun	818 (295)	857 (249)	954 (315)	876 (315)
		Verb	843 (339)	925 (294)	932 (306)	910 (335)
		Nonword	906 (245)	936 (235)	914 (318)	919 (295)
Experiment two	50 ms	Abstract noun	1005 (365)	1126 (286)	942 (369)	1028 (335)
		Adjective	992 (365)	1076 (286)	977 (369)	1017 (354)
		Nonword	993 (286)	1018 (339)	1019 (378)	1010 (425)
	500 ms	Abstract noun	991 (393)	888 (232)	889 (371)	921 (325)
		Adjective	1135 (320)	969 (229)	859 (350)	987 (310)
		Nonword	1202 (287)	972 (271)	752 (199)	975 (306)

respectively, in different ISI conditions regarding the ISI \* part of speech interactive effect. In the condition of 50 ms interstimulus interval, the reaction time of abstract noun is 1028 ms and that of verb is 1017 ms. The reaction time of nonword is 1010 ms (see experiment two, Table 1). There is no salient difference. In the condition of 500 ms interstimulus interval, the reaction time of abstract noun is 921 ms and that of verb is 987 ms. The reaction time of nonword is 975 ms (see experiment two, Table 1).

In this experiment, the prime words are abstract nouns or adjectives. The ISI condition effect is salient for the reaction time of target words [ $F(1,87) = 2.263$ ,  $MSE = 332489$ ,  $p = 0.100$ ,  $\eta = .035$ ]. There is salient part of speech effect [ $F(1,87) = 3.247$ ,  $MSE = 30320$ ,  $p = 0.042$ ,  $\eta = .043$ ]. The intergroup proficiency effect is also prominent [ $F(2,87) = 1.748$ ,  $MSE = 819357$ ,  $p = 0.10$ ,  $\eta = .046$ ]. There is salient interactive effect of ISI \* part of speech [ $F(1,87) = 2.75$ ,  $MSE = 57478$ ,  $p = 0.100$ ,  $\eta = .037$ ] and effect of prime ISI \* intergroup proficiency [ $F(2,87) = 2.818$ ,  $MSE = 97439$ ,  $p = 0.087$ ,  $\eta = .0384$ ] as well as apparent prime ISI \* part of speech \* intergroup proficiency [ $F(2,87) = 8.185$ ,  $MSE = 283000$ ,  $p < 0.001$ ,  $\eta = .185$ ].

Results show that the ISI \* part of speech \* proficiency interactive effect is salient. In the condition of 50 ms, reaction time of subjects with low proficiency is generally slow, but that of subjects of medium proficiency is the slowest one. High proficiency subjects had quicker reaction. The findings imply that subjects with high language proficiency tend to be affected by part of speech effect but the subjects with low and medium language proficiency show a lower part of speech effect.

In experiment two, abstract noun part of speech judgement consistency of low proficiency group is apparently higher than the concrete noun part of speech judgement consistency in experiment one. The adjective prime effect in experiment two is also higher than the verb prime effect in experiment one. But this variation in low and medium proficiency groups is not salient. This means the lower the English proficiency of the subjects is, the stronger the paradigmatic mechanism part of speech effect will be.

In experiment one, the prime words are concrete nouns or verbs. ISI priming effect, part of speech effect, and intergroup proficiency effect are shown in the judgements consistency of target words. In the condition of ISI 50 ms, reaction time of noun prime word is shorter than that of verb prime word (see experiment one in Table 2). Generally, subjects with low English proficiency have a slower reaction than those with high proficiency. In the condition of ISI 500 ms, reaction time of verb prime word is longer than that of noun prime word (see experiment one, Table 2). In terms of different levels of English proficiency, subjects with low proficiency have a slower reaction than those with high proficiency. In both of the two ISI conditions, subjects with high proficiency show quicker reaction than those with low proficiency on average (see experiment one, Table 2).

In experiment two, the prime words are abstract nouns or adjectives. ISI priming effect, part of speech effect, and intergroup proficiency effect as well as interactive effect are shown in the judgements consistency of target words. In the condition of ISI 50 ms, reaction time of noun prime word is longer than that of adjective prime word (see experiment two, in Table 2). The reaction time of prime nonword is the shortest. Generally, subjects with low English proficiency have a faster reaction than those with high proficiency (see experiment two, in Table 2). In the condition of ISI 500 ms, reaction time of noun prime word is shorter than that of adjective prime word. The reaction time of prime nonword is the shortest (see experiment two in Table 2). In terms of different levels of English proficiency, subjects with low proficiency have a slower reaction than those with high proficiency. But in this condition, subjects with high proficiency showed slower reaction time of nonword judgement than those with low proficiency (see experiment two in Table 2).

**4.2. Results Analysis.** According to the data statistic analysis shown by the experiments' findings, the three hypotheses have been tested. In experiment one, in the condition of 50 ms and 500 ms, respectively, and the prime word as

TABLE 2: Three English proficiency groups' percentage of part of speech prime judgement consistency.

Experiment	ISI condition (ms)	Part of speech	English proficiency		
			Low ( $N=30$ )	Medium ( $N=30$ )	High ( $N=30$ )
Experiment one	50	Noun	0.465 (0.11)	0.444 (0.16)	0.387 (0.09)
		Verb	0.493 (0.16)	0.538 (0.18)	0.692 (0.09)
		Non-word	0.016 (0.02)	0.016 (0.09)	0.054 (0.07)
	500	Noun	0.458 (0.17)	0.371 (0.20)	0.508 (0.11)
		Verb	0.253 (0.20)	0.479 (0.20)	0.675 (0.12)
		Non-word	0.041 (0.08)	0.037 (0.08)	0.041 (0.08)
Experiment two	50	Abstract noun	0.503 (0.18)	0.368 (0.12)	0.467 (0.16)
		Adjective	0.313 (0.20)	0.447 (0.20)	0.587 (0.16)
		Non-word	0.007 (0.02)	0.007 (0.02)	0.067 (0.01)
	500	Abstract noun	0.373 (0.11)	0.340 (0.20)	0.471 (0.11)
		Adjective	0.424 (0.20)	0.507 (0.20)	0.550 (0.20)
		Non-word	0.012 (0.03)	0.003 (0.01)	0.012 (0.03)

concrete nouns, the judgement consistency of the three groups are all lower than 50%. It indicates that the syntagmatic effect is bigger than the paradigmatic effect. The judgement consistency of high level proficiency in the condition of 50 ms is the lowest (38.7%). Hypothesis three is verified. The higher the subjects' English proficiency level is, the stronger the syntagmatic collocative consciousness is. The syntagmatic structure of NP + VP is a typical collocative structure in both English and Chinese. When the prime word is a verb, in the condition of 50 ms and 500 ms, the part-of-speech judgement consistency of high English proficiency level is apparently higher than the other two groups. It indicates the higher the English proficiency level is, the more salient is the verb paradigmatic cognitive mechanism effect. English and Chinese are quite different in terms of part of speech features of verb. The individual verb without collocative word string tends to be ambiguous in terms of part of speech feature.

In experiment two, in the condition of 50 ms and 500 ms, respectively, and the prime word as abstract nouns, the judgement consistencies of the three groups are all lower than 50%. It indicates that the syntagmatic effect of NP + VP is bigger than the paradigmatic effect of N-N. The differences of judgement consistency among the three groups are not salient when the prime word is abstract noun in experiment two or when the prime word is concrete noun in experiment one. But in experiment two, when the prime word is adjective, the judgement consistency is apparently lower than that in experiment one when the prime word is verb. It is affected by Adj.+NP syntagmatic effect. The collocative Adj.+NP structures are typical in both English and Chinese.

*4.3. General Discussion.* Part of speech property and the grammatical function of syntactic elements are not one-to-one corresponding relations. There is not a cause-effect relation either. Compared with Chinese language, English is abundant in morphological representation. Language learners can identify the part of speech category according to morphological markers in most cases. But part-of-speech features in Chinese language, especially that of words with a concrete meaning, are mostly implicit. The dual-pathway

references, that is, grammatical category in light of form and meaning category in light of sense, take effect in both English and Chinese language. Apparently in English, the former is an explicit reference while in Chinese the latter plays a more salient role. Grammatical function and meaning reference are mutually restricted and also complementary. Language is not the sheer logic construct.

Polysemy cognition mechanism influences language learners' part of speech recognition in lexical processing. This dynamic mechanism strengthens syntagmatic effect in the process of noun-verb collocation and adjective-noun collocation recognition. The higher the language learners' English proficiency is, the stronger the influence is. Lexical decision is influenced by word meaning in the phrase to a larger extent. The directions of transfer (from L1 Chinese to L2 English vs. from L2 English to L1 Chinese) are both influenced by the morphological structures of the languages involved. The higher the language learners' English proficiency is, the stronger their morphological awareness is.

## 5. Conclusion

The main purpose of this study is to observe how part of speech feature affects lexical choice process.

First, the experiments show that part of speech feature can be primed. For Chinese English learners, if without the construction syntagmatic semantic and syntactic constraints, the process of individual word extraction is affected by part of speech factor and the syntagmatic and paradigmatic effects exist. In experiment two, prime word is replaced by abstract nouns. The common semantic features of prime word and target word are weakened. The syntagmatic and paradigmatic effects in the condition of noun still exist.

Second, part of speech priming effect is influenced by subjects' English proficiency levels. Differences of judgement reaction time indicate that subjects with low proficiency level and those with high proficiency level take different cognitive simulation to arrive at the lexical access. Comparatively, subjects with low proficiency level tend to use the paradigmatic cognitive mechanism in a more direct way while subjects with high proficiency level tend to use both of the two mechanisms in an interactive way.

## Data Availability

The data used to support the findings of the study are available from the author upon reasonable request.

## Conflicts of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper.

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