

# *Exploring the Influencing Factors of the Syntactic Priming Effect in French Learners*

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**Abstract:** The syntactic priming effect, a prevalent and common linguistic phenomenon, has captured the keen interest of scholars within the realm of second language acquisition, leading to a wealth of insightful research findings. This study focuses on the syntactic priming effect specifically observed in learners of French as a second language. It meticulously reviews the research paradigms frequently adopted in prior experiments and consolidates the influencing factors of the French syntactic priming effect into two primary categories: internal learner factors and external linguistic factors. By scrutinizing these factors, the study uncovers the intricacies that shape the priming effect in French language learning. Furthermore, it pinpoints the limitations inherent in current research endeavors and proposes avenues for future investigations. The ultimate goal of this study is to offer some valuable insights that can help teachers to adapt their teaching methods and enhance French language teaching practices, fostering more effective learning outcomes for students.

**Keywords:** French as a second language, syntactic priming, influencing factors.

## 1. Introduction

The year 2024 marks the 60th anniversary of the establishment of diplomatic relations between China and France. Over these 60 years, with the development of globalization and the deepening of exchanges and cooperation between China and France, the number of people learning French in China has significantly increased, drawing more attention to the study of French as a second language (L2). Research has shown that syntactic priming can guide learners to produce syntactic structures beyond their current proficiency level, reinforce their existing knowledge, and promote the automatic extraction of language forms [1], which positively impacts L2 proficiency.

Syntactic priming is a common linguistic phenomenon where speakers tend to use syntactic structures they have previously heard or spoken [2]. For example, if someone first hears or reads a sentence containing a prepositional object (PO) structure, such as "My father gave an apple to me," the likelihood of subsequently producing a sentence with the PO structure increases. Similarly, if one first hears or reads a sentence containing a double object (DO) structure, such as "My father gave me an apple," the likelihood of subsequently producing a sentence with the DO structure also increases. In syntactic priming research, the initial sentence is referred to as the priming sentence, and the subsequent sentence is known as the target sentence. Syntactic priming occurs not only within the same language but also in cross-language learning contexts.

Since the 1980s, research on syntactic priming effects has gradually emerged in the field of L2 acquisition. Previous studies have identified various factors that can influence the syntactic priming effect, including input methods [3], lexical boost [4], and syntactic structure [5]. However, the relationships between these influencing factors are complex, and existing research has not sufficiently addressed French L2 learners. The factors that affect the syntactic priming effect in the process of learning French as a second language, as well as their common and unique characteristics, still require comprehensive review.

Therefore, this study conducted searches using keywords such as "syntactic priming" and "French" on the China National Knowledge Infrastructure and Web of Science databases. This search yielded 2 Chinese studies, 1 French study, and 19 English studies. After manual screening, 6 highly relevant studies were retained for detailed review.

## **2. Research Paradigm**

Currently, many scholars have conducted empirical research on the syntactic priming effect, employing various research paradigms and tools in specific experiments, such as sentence-picture matching tasks, picture description tasks, sentence recall tasks, and sentence completion tasks. This section reviews and summarizes the existing research paradigms in studies on syntactic priming in French.

### **2.1. Sentence-Picture Matching Task**

The sentence-picture matching task requires participants to read and comprehend a given priming sentence, then select or judge the image that accurately reflects the content of the sentence based on their understanding. This task is widely used in empirical research on syntactic priming. For example, in Zhou's [6] study, Chinese participants entered the judgment phase after reading a French sentence. They were presented with a picture on a computer screen and asked to press a button to determine whether the content of the previous sentence matched the content of the picture. Slim [7] conducted a unique experiment using two L2-French sentence-picture matching tasks. Participants were required not only to match the priming sentence with the image but also to choose between two images with different meanings corresponding to the target sentence. The consistency between the priming sentence matching strategy and the target sentence matching strategy was used to determine whether the participants successfully initiated syntactic priming effects.

The sentence-picture matching task combines textual and visual information, making the experimental process more vivid and flexible, thereby enhancing participants' comprehension and memory of the given priming sentence. However, this task focuses only on matching and does not involve the participants' autonomous sentence production, thereby lacking an examination of their sentence production ability. Consequently, it is not effective in testing the role of syntactic priming in actual production. For this reason, this task is typically used as an auxiliary task in conjunction with other research paradigms, such as picture description tasks.

### **2.2. Picture Description Task**

The picture description task involves participants describing a given image in a single sentence (target sentence) after processing a priming sentence. If the structure of the target sentence aligns with that of the priming sentence, it indicates the presence of a priming effect. When describing images, key word prompts are often provided. For example, in the study by Coumel [8], participants were required to produce a sentence describing the image using French word labels (verbs, articles, and noun combinations) displayed on the image to prevent vocabulary difficulties.

This task requires participants to independently produce the target sentence, emphasizing their autonomy and initiative, while also eliminating the influence of other interfering factors such as vocabulary repetition, question elements, or prosodic consistency found in simpler text-based tasks, effectively testing the syntactic priming effect. However, this task lacks a contextual framework and differs significantly from real-life language application scenarios, limiting its applicability. It is, therefore, best used in conjunction with methods that create authentic dialogue situations.

### 2.3. Sentence Recall Task

The sentence recall task involves participants first reading a given target sentence, then reading a priming sentence containing a specific syntactic structure, and finally being asked to recall and retell the target sentence. Due to the speed of presentation and the complexity of sentence structure, participants typically remember only the general meaning of the sentence. When retelling the target sentence, they are easily influenced by the priming sentence and may reconstruct the target sentence using the structure of the priming sentence, resulting in a syntactic priming effect. For example, in Li's [9] Sino-French cross-language priming study, the target sentence was presented in French with each word lasting 210 ms, ensuring that readers could understand the general meaning of the sentence but could not remember its exact structure. After a 50 ms "#" mask appeared, a Chinese priming sentence was displayed on the screen. Participants were then asked to loudly repeat the Chinese priming sentence to activate syntactic structure information, and subsequently recall the initial French target sentence. If they produced a target sentence with the same structure as the priming sentence, the syntactic priming effect was observed.

This paradigm allows participants to reconstruct the target sentence with autonomy and flexibility, reflecting their ability to independently produce sentences. However, it imposes a greater cognitive and memory burden on participants, which may affect their deep understanding and perception of syntactic structures, leading them to rely on structures they have already mastered proficiently, causing potential experimental errors. Therefore, this paradigm is most suitable for studying the syntactic priming effect in simple sentences.

### 2.4. Sentence Completion Task

In the sentence completion task, researchers present incomplete priming sentences in written or oral form and ask participants to complete them. Participants are then asked to complete another set of target sentences in the same way. If participants use the same syntactic structure as the priming sentence when completing the target sentence, a priming effect is generated. Hartsuiker [10] employed this research paradigm in their experiments. For example, the priming sentence was "Claire a rendu visite aux élèves du professeur qui étaient..." (English translation: Claire visited the students of the professor who were...), where "étaient" resolves sentence ambiguity, indicating that the relative clause guided by "qui" modifies the plural noun "élèves." After completing the priming sentence, participants were asked to complete the target sentence, such as "La tempête a détruit les fenêtres du bungalow qui..." (English translation: The storm destroyed the windows of the bungalow that...), where the modifier of the relative clause is ambiguous. If participants completed the target sentence in the same way as the priming sentence, meaning "qui" modified "fenêtres" instead of "bungalow," a priming effect was observed. Participants were required to write down the first completion word that came to mind to form a grammatically correct and reasonable sentence.

Using sentence completion tasks to test the syntactic priming effect also has certain limitations, as it is susceptible to other factors such as repeated vocabulary and experimental timing. For example, Branigan [11] found in their experiment that when two priming sentences and target sentence fragments were presented consecutively and rapidly, participants tended to use the same syntactic

structure to complete the target sentence. However, when sentence fragments with unrelated syntactic structures were inserted between the priming sentence and the target sentence fragments, the syntactic priming effect disappeared.

### **3. Learner Factors Influencing Syntactic Priming**

#### **3.1. Language Proficiency**

The influence of learners' second language proficiency on the syntactic priming effect has long been an important research topic for scholars. In the field of French language learning, both domestic and international scholars have conducted a series of empirical studies using the proficiency level of the subjects' second language as a variable, drawing different conclusions.

Some scholars have focused on the impact of proficiency in French as a second language on priming effects. For example, in Li's [9] study on Sino-French cross-linguistic syntactic priming, participants were divided into two groups based on their French proficiency: high-level and low-level. The results showed that learners with high French proficiency exhibited more significant priming effects than those with low French proficiency. Similarly, Coumel [8] identified differences in syntactic priming effects among participants with varying levels of French proficiency in their study. However, their conclusions differed; their experiment demonstrated that low-level participants exhibited stronger priming effects.

Some researchers have also focused on multilingual learners, discussing the impact of different second language proficiency levels on priming effects. Sun [12] studied Chinese learners of English and French as second languages, examining the impact of varying proficiency levels on their language priming effects. They found that, compared to advanced English proficiency, subjects with lower French proficiency exhibited weaker priming effects. However, Hartsuiker [10] disagreed with this conclusion. Their study focused on Dutch native speakers learning English and French and found that although the subjects had higher proficiency in English and lower proficiency in French, the syntactic priming effect was consistent within and between languages. The priming effects within L1, between L1 and L2, and between two different L2s were equally strong, challenging the assumed relationship between syntactic priming effect and second language proficiency.

Currently, scholars in the field of French second language research have not reached a consensus on the relationship between second language proficiency and syntactic priming effects. The main divergence in research lies in the notion that the influence of language proficiency on the syntactic priming effect is regulated by priming modes. Some scholars have suggested that in the L1-L2 cross-linguistic syntactic priming process, only high-level second language learners can establish abstract structural connections between words and sentences in both languages, resulting in a stronger syntactic priming effect [9]. However, in L2 syntactic priming, high-level individuals are less susceptible to the influence of priming sentences and tend to produce sentences based on their usual usage habits, as they have already internalized specific sentence structures. Therefore, the priming effect is relatively weak. Additionally, some scholars believe that the logical representation of sentences is fully shared across languages, so the strength of syntactic priming effects is not affected by specific language proficiency levels [10].

#### **3.2. Working Memory Load**

In the study of syntactic priming effects in French as a second language, working memory (WM) load has also garnered attention from scholars. For example, Coumel [8] found that WM load indirectly affects syntactic priming effects, and its impact varies among learners with different second language proficiency levels. In their experiment, the researchers introduced a WM task, specifically a letter sequence memory task, between the sentence-picture matching priming task and the picture-

description target task. The results showed that manipulating WM load successfully influenced the priming effect, but performance varied among learners of different proficiency levels: low-level learners exhibited roughly the same priming effect under both low and high WM load conditions, while high-level learners showed a weaker priming effect under high WM load and a stronger priming effect under low WM load.

According to the hypothesis of Zhang [13], high WM load conditions can interfere with the process of explicit memory. Therefore, the WM task in the experiment effectively manipulated the extent to which participants relied on explicit memory strategies during the task. Coumel [8] suggest that low-level learners rely on the same explicit memory process under both load conditions; even under high WM load, they attempt to remember the priming sentence structure as much as possible to compensate for their limited experience in L2 output. In contrast, high-level second language learners, having already internalized the syntactic system and structural features of the second language, rely on their accumulated knowledge and usage habits to produce sentences under high WM load conditions, no longer depending on the priming sentence structure, resulting in a weaker syntactic priming effect.

## 4. Language Factors Influencing Syntactic Priming

### 4.1. French Priming Structure

In addition to learners' subjective factors, external objective factors, such as the structure of French priming sentences, can also affect the outcomes of syntactic priming effects. Both Sun [12] and Zhou [6] found in their research on French second language priming that there are two syntactic structures in French: DO (verbe + à/pour quelqu'un quelque chose) and PO (verbe + quelque chose à/pour quelqu'un). Significant differences exist in the priming effects caused by these different structural types, with the PO structure producing a greater priming effect.

According to Sun's analysis, this phenomenon may be related to the frequency of sentence structure usage. The PO structure is used less frequently in French, and learners may not be as proficient in mastering it, leading to significant obstacles and errors in its use. Therefore, priming stimuli can guide participants to strengthen their understanding and application of it, leading to a greater priming effect—namely, the reverse frequency effect. From a semantic perspective, the "X + verbe + à/pour + Y + Z" structure means "X makes Y occupy Z," while the "X + verbe + Z + à/pour + Y" structure means "X makes Z move toward Y" [14]. The DO structure constructs the semantic context of "possession," while the PO structure can construct two different semantic contexts: "possession" and "non-possession" [15], indicating that the meaning of the PO structure is more extensive. As a result, participants may choose more PO structures when producing target sentences, and the priming effect of PO structures is significantly greater than that of DO structures.

### 4.2. Language Differences

In cross-linguistic syntactic priming, the difference between the language of the priming sentence and the target sentence is also a factor of concern for scholars, and a consensus has not yet been reached.

Li [9] conducted research using "raising verbs" as experimental material. Raising verbs refer to verbs that can shift the subject of a clause to the subject or object position of the main clause through noun phrases. Such verbs exist in most languages, such as "sembler," "paraître," and "avérer" in French, and "似乎" (sìhū) and "好像" (hǎoxiàng) in Chinese. Research has found that, regardless of French proficiency level, Chinese priming sentences without raised subjects are unable to initiate French target sentences. Li [9] analyzed that this may be due to language differences in the structure of "raising verbs" in Chinese and French, where the subject is not raised. For example, in Chinese, '她似乎喜欢那本书' (tā sìhū xǐhuān nà běn shū, English translation: "She seems to like that book")

can form a one-to-one correspondence between words and syntax with the French sentence 'Elle semble aimer ce livre.' However, if the Chinese sentence '似乎她喜欢那本书' (sìhū tā xǐhuān nà běn shū, English translation: "It seems that she likes that book") is translated into French, the formal subject 'il' must be added at the beginning of the sentence to form 'Il semble qu'elle aime ce livre.' The differences between Chinese and French make it difficult for even high-level French learners to establish a connection between the two languages, thereby preventing the generation of cross-linguistic syntactic priming effects.

However, Hartsuiker [10] studied native Dutch speakers learning English and French and found no difference in the effect of syntactic priming within and between these three languages. The priming effects within the first language, between the first and second languages, and between two different second languages were equally strong. They suggested that although there are differences among Dutch, French, and English, bilingual logical representations and grammatical structures are completely shared among these three languages, so the linguistic type does not affect syntactic priming effects.

Overall, the main difference between these two studies lies in the degree of language similarity. Chinese and French belong to different language families with significant differences in language structure, making it difficult to initiate cross-linguistic syntactic priming effects. In contrast, English, French, and Dutch all belong to the Indo-European language family, and the structural materials selected in the experiment have high consistency across these languages, resulting in strong cross-linguistic priming effects.

## 5. Conclusion

This article reviews existing literature and summarizes research papers on the syntactic priming effect in French as a second language, both domestically and internationally. It outlines the basic research paradigms used in experiments, including sentence-picture matching tasks, picture description tasks, sentence recall tasks, and sentence completion tasks. The main factors influencing the syntactic priming effect in French learners are analyzed at both the learner level and external language level, including second language proficiency, working memory, priming sentence structure, and cross-linguistic differences. Previous research findings hold important implications for French language teaching, suggesting that teachers should incorporate syntactic priming methods in the input process, guide learners to notice syntactic structure characteristics, reinforce correct language forms, and tailor instruction to learners' proficiency levels and language backgrounds to effectively enhance their French language abilities.

Future research on the syntactic priming effects in French as a second language could further improve and expand within the context of teaching practice. Current research is primarily conducted in laboratory environments, with limited studies focusing on syntactic priming in real foreign language classrooms. Additionally, the scope of research could be extended to more diverse application environments, such as exploring the influence of natural discourse or specific contexts on priming effects.

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