

第一言語と第二言語におけるコロケーション処理への頻度と 一貫性の影響の概要

An Overview of the Effect of Frequency and Congruency on Collocational Processing in the First and Second Language

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Keywords コロケーション処理, 頻度, 一貫性, 第一言語と第二言語
Collocational processing, Frequency, Congruency, First language and Second language

ABSTRACT

本稿では、一言語（L1）話者と第二言語（L2）話者のコロケーション処理について、頻度と一貫性の観点から考察する。コロケーションとは、よく一緒に使われる単語の組み合わせであり、L1話者は自然に使いこなすが、L2話者には習得が難しい。先行研究では、頻度が語の認識速度と正確さに影響を及ぼし、L1話者は豊富な知識と速い処理速度を持つ一方、L2話者は比喩的コロケーションの理解に時間がかかり、処理が遅れる傾向がある。これは、L2話者が単語を一つ一つ分析するためである。また、一貫性効果の研究では、L2話者が母語と同じ意味のコロケーションを処理しやすいことが示されており、L1の知識を利用してL2を理解するためである。改訂階層モデル（RHM）によると、L2の習熟度が上がるとL1の影響が減少し、L2処理が効率的かつ正確になる。今後の研究では、異なる言語や文脈におけるこれらの認知メカニズムをさらに調査する必要がある。

This paper examines the processing of collocations in both first language (L1) and second language (L2) speakers, focusing on the influence of frequency and congruency. Collocations, as a type of formulaic language, play a crucial role in communication, allowing L1 speakers to process language fluently by relying on stored lexical chunks. However, L2 speakers often struggle with collocations due to less frequent exposure and the arbitrary nature of word combinations. This research highlights how frequency impacts the speed and accuracy of word recognition, with L1 speakers showing faster processing due to their extensive collocational knowledge. L2 speakers, conversely, process collocations more slowly, particularly figurative ones, due to their limited exposure and reliance on computational routes. The congruency effect, where L2 speakers find it easier to process collocations that align with their L1, is also explored. The Revised

Hierarchical Model (RHM) is employed to explain how L1 activation diminishes with increased L2 proficiency, leading to more efficient and accurate L2 processing. Understanding the challenges posed by frequency and congruency can inform more effective teaching strategies, aiding L2 learners in achieving greater fluency and accuracy in their target language. Future research should further investigate these cognitive mechanisms across different languages and contexts.

1. Introduction

Research in bilingual processing over the last four decades has identified that first language (L1) and second language (L2) speakers have different processing mechanisms, in turn, showing significant differences in speed and accuracy in processing the dominant and weaker language. One factor determining a speaker's language competency is the accurate and appropriate usage and recognition of word combinations of formulaic languages, one of which is collocations.

Many studies have shown that L2 learners have difficulties grasping collocations since they are arbitrary and are not identified by grammatical rules of structures. As a result, collocational errors are presented as the most prominent errors in L2 speakers' text (Waller, 1993) and suggest that the rate of acquisition of collocational knowledge is slower than individual lexical items (Bahns & Eldaw, 1993). Whereas with L1 speakers, they play a vital role in communication, enabling them to intuitively retrieve recurrent word combinations stored as chunks in long-term memory, thereby reducing cognitive processing demands (Hunston & Francis, 2000; Wood, 2002).

To explore this difference further, this paper aims to introduce the nature and characteristics of collocations, as well as to examine the factors and mechanisms involved in collocational processing for L1 and L2 speakers.

2. What are Collocations?

Formulaic language is referred to as semi-fixed

combinations of words that have a specific meaning that cannot be derived from individual meanings of their components. In fact, it is predicted that one third to one half of native speakers' discourse production is composed of formulaic sequences (Conklin & Schmitt, 2008). Given that formulaic utterances constitute a large portion of linguistic knowledge, they play a crucial role in language use and communication, enabling the native speaker to process language both fluently and idiomatically to fulfill basic communicative needs. One type of formulaic language is collocations, defined as multiword lexical items that habitually occur together (Cruse, 1986). Describing specific instances, for example, may vary depending on the cultural context and the language used. In English, phrases like '*heavy rain*' are frequently used. However, in Japanese, expressions like '*strong rain*' [強い雨] are considered more acceptable interpretations than their English counterparts.

Many of the collocational studies have dealt with the nature and processes involved in collocations of two types: literal and figurative.

2.1 Literal Collocations

Literal collocations are understood in a 'Meaning A + Meaning B' manner; learners can simply learn and understand the collocation by combining the meanings of the individual components (e.g., '*heavy rain*'). Considering the pattern for the word combinations, learners could have a hard time associating certain words with each other because the word pattern is not in line with how it is used in their L1 (e.g., '*strong rain*', '*tough rain*').

2.2 Figurative Collocations

Figurative collocations are different from literal collocations in that they have figurative meanings that cannot be inferred from the individual components of the words. They often carry cultural nuances and context-specific meanings that reflect the culture's history, background, and societal values. For example, '*break the ice*' is an expression in English used to describe the action of relieving tension or awkwardness in a social situation. While the understanding and usage of this common English figurative expression are universal in English-speaking countries, such an expression is absent and cannot be directly translated into languages like Japanese. Therefore, figurative collocations are indeed more challenging since learning them requires not just knowledge of vocabulary and grammar, but also cultural awareness and context.

3. Factors Influencing Collocational Processing in L1 and L2 speakers

A collection of prior studies reveals two main factors that influence collocational processing of L1 and L2 speakers: frequency and congruency effect. With respect to these, they can be explained by mechanisms unique to when using either the speakers' L1 or L2.

3.1 Frequency Effect

One consistent finding in studies on collocational processing is the link between the size of collocational knowledge and the speed of word recognition. Durrant and Doherty (2010) conducted a lexical decision task with literal collocations and found that L1 speakers of English showed collocational priming with highly frequent collocations. Similarly, Wolter and Yamashita (2014) compared L1 English speakers with Japanese English learners and found that word

recognition was faster for L1 speakers when reading collocative phrases compared to non-collocative phrases. This evidence suggests that a greater amount of collocational knowledge leads to faster word recognition processing.

In a more recent study, Shi et al. (2022) explored the difference of L1 and L2 speakers in reading speed of figurative and literal collocations. In this self-paced reading experiment, the results showed that L2 speakers spent longer time reading collocations than L1 speakers, particularly the figurative collocations. This finding was further supported by an eye-tracking study conducted by Li et al. (2021, 2022), which suggested that strong collocations with higher frequency were read faster, and regression rates (re-reading behavior) were lower compared to weak collocations for both L1 and L2 speakers. However, L1 speakers still read the collocations quicker overall than L2 speakers with less regression patterns.

An explanation for this account can be tied with age of acquisition, that more frequent encounters of a language pattern from early experience can form larger lexical chunks and give rise to faster and more accurate processing of fixed expressions. Additionally, the dual-route model proposed by Wray (2002) explains familiar and unfamiliar word recognition using two pathways. In the direct retrieval route, words that are frequent and familiar are stored in the mental lexicon and the meanings are accessed directly, making it a fast and efficient lexical route for recognizing words. With the computational route, novel phrases are processed using the non-lexical approach, relying on computing and integrating the individual components, which add cognitive load to processing.

This cognitive framework can be extended to account for L2 acquisition of formulaic language. Because L1 speakers often encounter and subconsciously use formulaic languages, the

frequent use and exposure of phrases become lexicalized in the mental lexicon as a single block of language (e.g., Siyanova-Chanturia, et al., 2011; Wray, 2002). Assuming that L1 speakers have over thousands of formulaic sequences, including collocations, stored in the mental lexicon, they depend more on the direct route for processing and rely on phrasal representation to access collocational semantics, making processing of formulaic language efficient (Pawley & Syder, 1983). In contrast, L2 learners with insufficient exposure or limited L2 proficiency have few formulaic expressions stored in their mental lexicon. Instead, they are more inclined to rely on the computational route and analyze the meaning of the entire phrase letter-by-letter (Jiang, 2022). These studies indicate that frequency information impacts learners' processing at various levels of language representation.

3.2 Congruency Effect

Congruency of collocations refers to 'the presence or absence of a literal L1 translation equivalent' (Peters, 2016), which are often seen in literal collocations than figurative collocations. The congruency effect is significant due to the dual activation of lexical representations in bilinguals, where both languages are co-activated simultaneously. This allows access to both mental lexicons, making cross-language influence subconscious and inevitable. For instance, 'call a taxi' in English and 「タクシーを呼ぶ」 in Japanese are congruent, while "heavy rain" in English and 「強い雨」 ('strong rain') in Japanese are not.

Wolter and Gyllstad (2013) examined how congruency affects collocational processing in L2 English speakers. They tested three types of English word combinations: congruent (L1 equivalents), incongruent (acceptable in English but not in L1), and unrelated. Results showed that L2 speakers responded faster and more accurately to congruent

pairs, indicating that processing is quicker when word pair semantics match their L1. This aligns with the language transfer phenomenon, where L2 speakers use their L1 to reduce cognitive load (Jarvis & Pavlenko, 2007).

Wolter and Yamashita (2018) extended their research to also study congruency effect using adjective-noun collocations for L2 English speakers. The research yielded comparable results with Wolter and Gyllstad (2013), where they discovered that L2 speakers exhibited a processing advantage for collocations that were congruent. Their findings further suggest that with increased experience in the L2, congruent collocations transferred from the L1 become more deeply integrated due to repeated exposure, whereas incongruent collocations that can't be transferred become less entrenched over time due to lack of reinforcement.

Such negative transfer errors can be explained by the Revised Hierarchical Model (RHM) developed by Kroll and Stewart (1994). The model suggests that the activation of L1 is negatively associated with L2 proficiency, such that speakers with greater knowledge of the L2 are more competent at processing L2 input using concepts and semantics related to L2. For L2 learners, especially those with lower proficiency, the translation from L1 is often necessary to comprehend and process L2 linguistic patterns. Consequently, when a lexical word in L1 and L2 appears congruent but is actually linguistically incorrect, the reliance on L1 can lead to the misuse or misunderstanding of L2 words and phrases.

In contrast, L1 speakers can access meanings directly within their native language without the need for translation, as their L1 knowledge is integrated with other L1-specific information. This direct access to meanings allows L1 speakers to process their native language efficiently, without significant influence from any additional languages

they might speak. Therefore, even in cases where there is incorrect congruence in a collocation, L1 speakers are less likely to be influenced by their L2, maintaining accurate and intuitive use of their native language.

4. General Discussions

In conclusion, the processing of collocations in both L1 and L2 languages is significantly influenced by two main factors: frequency and congruency. For L1 speakers, the frequent and early exposure to collocational patterns allows for the formation of strong lexical representations, which facilitates faster and more accurate language processing. In contrast, L2 speakers often face challenges due to less frequent exposure and differences in collocational patterns between their L1 and L2, leading to slower processing and a higher likelihood of errors. The congruency effect further highlights the role of cross-linguistic influence in L2 collocational processing. When collocations in L2 align with those in L1, L2 speakers tend to process them more efficiently. However, incongruent collocations that do not have direct L1 equivalents pose greater difficulties, often resulting in negative transfer errors.

These findings highlight the complexity of bilingual language processing and the crucial roles of frequency and congruency in collocation acquisition. For L2 learners, understanding these factors can help educators design targeted strategies to address specific challenges. Additionally, this research enhances our understanding of how bilinguals manage multiple linguistic systems. Future studies should further investigate these factors across different languages and contexts to improve our understanding of collocational processing in L1 and L2.

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