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# **The role of lexico-syntactic features in noun phrase production and comprehension: insights from Spanish and Chinese in unilingual and bilingual contexts**

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## Summary

This dissertation investigates how bilingual speakers process lexico-syntactic features, including grammatical gender, classifier systems, and the linear order of adjectives and nouns, across Spanish and Chinese in both unilingual and bilingual contexts. The central focus is on how early Spanish–Chinese bilinguals, particularly those residing in Barcelona, Spain, process and produce grammatical gender in Spanish and classifiers in Mandarin Chinese. It also examines how these bilinguals resolve syntactic conflicts arising from differences in adjective placement across the two languages, where Spanish typically places adjectives postnominally while Chinese places them prenominal. Drawing on behavioral and, where relevant, electrophysiological data, and employing a multi-task approach that integrates elicitation, repetition, and acceptability judgment tasks, this dissertation provides a comprehensive account of bilingual morphosyntactic processing in both experimental and semi-naturalistic contexts. The findings contribute to broader discussions in bilingualism and psycholinguistics by illuminating the mechanisms through which bilinguals reconcile distinct grammatical systems in language production and comprehension.

This dissertation is divided into seven chapters.

**Chapter 1** introduces the research background and the core research questions and provides a concise overview of the main content of each chapter.

**Chapter 2** begins by examining how grammatical gender, as a lexico-syntactic feature, is processed during NP production in unilingual Spanish. Using a picture-word interference (PWI) paradigm with Spanish speakers, we tested whether gender congruency and semantic relatedness affect picture naming latencies. The goal was to determine if grammatical gender is activated and competitively selected during speech production and whether this process results in a gender congruency effect. This chapter is important because it clarifies the inconsistent findings of previous research.

ch on Spanish NP production and provides empirical evidence for the gender congruency effect. It also sets the foundation for later chapters by establishing how a key lexico-syntactic feature, i.e., grammatical gender, is processed in a unilingual context.

**Chapter 3** shifts from unilingual Spanish contexts to bilingual Spanish–Chinese contexts. It focuses on how early Spanish–Chinese bilinguals assign Spanish grammatical gender to Chinese nouns when processing and producing mixed Spanish–Chinese NPs. By using a multi-task approach, this study identifies which gender categories (i.e., masculine or feminine) in Spanish are most often assigned to Chinese nouns and what strategies bilinguals use during this process. The findings suggest that gender assignment in bilinguals is modulated by task demands. Specifically, in language production, bilinguals predominantly employed the masculine default strategy alongside the translation equivalent strategy. In contrast, during language comprehension, participants showed a stronger reliance on the translation equivalent strategy. These results underscore the adaptive nature of bilingual language processing, demonstrating that the selection of gender assignment strategies is context-sensitive and dynamically shaped by the specific cognitive requirements of the task. This chapter contributes to our understanding of how bilinguals adapt language-specific features (i.e., grammatical gender in Spanish) to non-gendered items (i.e., Chinese nouns), especially across typologically different languages. It also links back to Chapter 2 by exploring whether the mechanisms observed among Spanish speakers with unilingual contexts are comparable to those among bilingual speakers within bilingual contexts.

In **Chapter 4**, we shift attention to another language in the bilingual language pair, Mandarin Chinese, and investigate how another type of abstract lexico-syntactic feature, the numeral classifier, is processed and produced in Chinese NP production. This study used picture-naming tasks and ERP (electrophysiological) measures to investigate whether classifiers are competitively selected during Mandarin Chinese NP production by both Mandarin Chinese speakers and early Spanish–Chinese

bilinguals. Specifically, it investigated participants' naming latencies, assessing the effects of classifier congruency and semantic relatedness between target pictures and distractor words, as well as the potential elicitation of specific ERP components. The findings identified a robust classifier congruency effect in both groups, supporting the idea that classifiers as lexico-syntactic features are competitively selected during NP production. This chapter parallels the findings on grammatical gender in Chapter 2 by focusing on the processing of lexico-syntactic features, while extending the investigation to a different language system. It further reinforces the parallels between classifier selection in Chinese and grammatical gender assignment in Spanish, suggesting shared underlying selection mechanisms.

In **Chapter 5**, we extend the investigation of classifier processing into bilingual contexts by examining how early Spanish–Chinese bilinguals assign classifiers to Spanish nouns in mixed Chinese–Spanish NPs. Using the same multi-task approach as in Chapter 3, this chapter explores how bilinguals assign classifiers to Spanish nouns during code-switching and identifies the strategies they use in classifier assignment. The results indicate that the strategies employed by bilinguals in classifier assignment are largely consistent with those reported in Chapter 3. The results provide important insight into how classifier assignment is managed during code-switching and how structural compatibility and language experience shape the assignment. Together with Chapter 4, this chapter completes the analysis of classifier use in both unilingual and bilingual contexts, in parallel to how Chapters 2 and 3 addressed grammatical gender. Furthermore, the classifier assignment strategies identified here show notable parallels with the grammatical gender assignment strategies discussed in Chapter 3, reinforcing the broader patterns in bilingual morphosyntactic processing.

**Chapter 6** moves beyond language-specific lexico-syntactic features to language-shared lexico-syntactic features, focusing on adjective-noun order, which is shared by both Spanish and Chinese but realized differently

in each language. Spanish features postnominal adjectives such as *manzana roja* ‘apple red’, while Chinese places adjectives prenominally like 红色的苹果 ‘red apple’. Specifically, this study examines how Spanish–Chinese bilinguals navigate adjective–noun word order conflict and assesses how predictions from the Matrix Language Frame (MLF) model and Minimalist Program (MP)-based approaches account for adjective–noun patterns in Spanish–Chinese code-switched constructions. Findings indicate that production data align with MLF predictions when Spanish served as the matrix language, but MP accounts better for overall production and comprehension patterns. In Chinese matrix contexts, both models were supported. This chapter is the first to empirically examine how grammatical constraints, derived from the MLF and MP, interact with Spanish–Chinese CS patterns, contributing to a growing body of research on adjective placement in bilingual speech. Moreover, our findings challenge the idea that a single theoretical model fully explains code-switching patterns; instead, they strongly suggest that both matrix language structure (MLF) and the features of individual lexical items (MP) interact and contribute to mixed constructions, leading to a more fine-grained understanding of syntactic integration. This chapter builds on the previous chapters by shifting the focus from language-specific to language-shared but conflicting lexico-syntactic features, making them a valuable site for studying how bilinguals manage syntactic differences across languages and providing a deeper understanding of how bilinguals resolve grammatical differences across languages in production and comprehension.

**Chapter 7** revisits the central research questions and synthesizes the main findings of the preceding chapters. It further elaborates on the theoretical and empirical implications of all studies, critically acknowledges their limitations, and outlines potential directions for future research.