

## Book review

**Nan Jiang:** *Second language processing: An introduction*. New York: Routledge, 2018, ISBN 978 0 415 70804 3, pp. 336.

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## 1 Introduction

Second language processing (SLP) is an important part of second language acquisition, and understanding SLP plays a key role in understanding the nature of language development and guiding second language teaching (Juffs and Rodriguez 2015: 6). *Second language processing: An introduction*, written by Nan Jiang, an internationally renowned second language researcher from University of Maryland, is part of the “Second Language Acquisition Research Series” and was published in 2018 by Routledge. It is the first comprehensive and systematic introduction to the field of second language processing. This book consists of a large number of the latest theoretical and empirical research results in second language acquisition, cognitive neurolinguistics, and psycholinguistics, and aims to reveal the cognitive processes in non-native language processing, which is worth the attention of teachers and students in related fields. There are seven chapters, mainly focusing on three aspects, the phonological, lexical, and sentential processing of second language. This article introduces the main content of the book and comments on its advantages and disadvantages.

## 2 Overview of content

The book consists of seven chapters and a postscript. The first chapter gives a general overview of second language processing. The following six chapters are divided into three parts, namely, the second and third chapters discuss phonological processing, the fourth and fifth chapters lexical processing, and the sixth and seventh chapters sentences processing. Each chapter begins with an overview of the significance, basic concepts, and focuses of the relative themes, as the title shows.

## 2.1 Chapter 1 – Introducing second language processing

This chapter introduces the concept, characteristics, and main themes of L2 processing in general and is divided into four parts. First, the author introduces the significance, major concepts, development process, and focus of L2 processing research in detail, pointing out three levels of processing: phonological, lexical, and sentential. The author suggests that compared with monolingual psycholinguistics and second language acquisition research, L2 processing has the following characteristics: 1) it is mainly concerned with the psychological process of second language use; 2) it is more complicated than monolingual psycholinguistics and has a broader research perspective; 3) it pays attention not only to the relationship between processing and presentation, but also to the relationship between processing and second language learning; and 4) it is an empirical study with strict manipulation of variables.

Later on, three common themes in L2 processing are introduced: second language learnability, the interaction of first and second language, and the nature of the age effect. Jiang claims the controversy in second language learnability is mainly because of the variance in research methods and standards. He proposes that there is mutual interaction between first and second language, mainly in the psychological representation and processing strategies, and concludes that a non-native language's acquirability is closely related to the age of onset in learning that language, yet the reasons are not unified and are mainly considered from the perspective of neuropsychology and cognition. In the last part, the author concludes that L2 processing research findings can provide practical insights for many areas, such as human-machine communication and language teaching, and collaboration between SLP and applied researchers can help realize the full potential of SLP in dealing with practical problems.

## 2.2 Chapter 2 – Phonological processing in L2: Concepts, methods, and models

In this chapter, Jiang elaborates on the basic knowledge of L2 phonological processing. First, the author details the process of language production and the acoustic cues used in speech perception, such as frequency. The author then explores cross-linguistic differences in sound systems, including sound inventory and acoustic details, distinctive features, and phonotactics. Jiang summarizes the methods of phonological processing research, as well as introduces and enumerates

the types of tasks and evaluation methods commonly used in perception and production research, analyzing their advantages and disadvantages. For instance, the evaluation of participants' speech production samples is influenced by rating scale, number of native speaker (NS) judges, the NS-NNS (non-native speakers) ratio in the speech samples, and the criteria for performances. Jiang introduces four commonly used theoretical models for L2 phonological processing, including the Speech Learning Model (SLM), the Perceptual Assimilation Model (PAM), the Native Language Magnet Model (NLMM), and Featural Models. These models all recognize the paramount role of the L1, but they differ in the emphasis on L2 phonological development, the range of phenomena considered, and the level of focuses.

### **2.3 Chapter 3 – Phonological processing in L2: Issues and findings**

This chapter discusses the factors most discussed in L2 phonological processing: L1 and age of acquisition. With respect to the role the L1 plays in phonological processing and development, the author believes that 1) while the L1 influences L2 speech processing, there are certain challenges experienced by L2 learners regardless of L1 background, including individual articulatory constraints and the use of duration information in speech perception; 2) the effect of L1-L2 overlap is accepted in the field, but there are still unknowns, such as how to quantify the cross-linguistic similarity; 3) the L2 can affect the L1, but the nature of this effect (temporary or long-term) and the relevant constraints require further attention; 4) simultaneous bilinguals can separate two phonological systems, but there may be interactions between them.

Researchers agree that age of acquisition affects second language processing especially for pronunciation, but they disagree on whether nativelike phonology is attainable for L2 learners and what causes differences between child and adult L2 speech development. In this regard, the author believes greater attention should be paid to the assessment of nativelikeness in phonology as well as broader defining and operationalizing of nativelikeness measures. For age-related differences, there are three perspectives of explanation: neurophysiology, neurocognition, and L1 entrenchment. In addition, L2 phonological processing and development are related to other factors, including L2 experience, L1 use, segment-related factors, and phonetic training.

## 2.4 Chapter 4 – Word recognition in L2

This chapter is one of two chapters on L2 lexical processing. The author discusses the structure of the second language lexicon, pointing out that, compared with L1, form-based connection plays a more important role in L2 lexical organization as a result of the conscious and deliberate nature of the learning process associated with L2 and the weak connection between L2 lexical form and meaning. Additionally, episodic memory may be a strong component related to L2 representation. The author also considers the role of L1 in L2 word recognition, and finds consistent support for the role played by L1 lexical features, such as orthographic depth, in L2 visual word recognition. In addition, a large number of studies have found a relationship between L1 phonological development and L2 word recognition and reading skills. For example, L2 word recognition appears to automatically activate L1 translation, and L2 lexical processing is much influenced by L2 lexicon frequency. In the end of the chapter, the author reviews the integration of new words in the existing lexical system and discusses the controversy still surrounding the integration process and the relationship between new and old words. The author claims that the findings of the above-mentioned L2 lexical processing remain to be confirmed and fully explained.

## 2.5 Chapter 5 – Processing complex words, multiword units, and meanings in L2

In this part, Jiang directly concludes that it is still under debate whether complex words are represented and processed as a whole or by decomposition. He believes that the mixed results may be due to research paradigm inconsistency. Though there are still unresolved questions, the fact that morphological features of L1 and processing strategies influence complex words processing in L2 is well accepted. As for multiword units, the holistic representation view, which proposes that multiword units are represented and processed holistically as unanalyzed units, is widely accepted, yet there is only limited research on this issue. L1 word knowledge is consistently demonstrated to be an important factor in the processing of L2 collocation, but the order or relation of figurative and literal meanings in L2 idiom processing is still unclear. As for how lexical meanings are represented and processed in L2 speakers, findings show certain effects of L1, and the author proposes a comprehension-restructuring model of semantic development. Brain imaging technology has been used to compare L1 and L2 processing, but results

are mixed. Finally, the author puts forward the questions to be answered in this field in the summary section.

## **2.6 Chapter 6 – Sentence processing in L2: Parsing**

This chapter discusses sentences with ambiguities and models of syntactic parsing, the role of L1 in L2 parsing, lexicosemantic and syntactic information in L2 parsing, and the role of working memory in L2 sentence processing. The author points out that the study of ambiguous sentences can reveal the construction process of syntactic structure in processing. To answer the question of what information is used in initial parsing, two models are put forward: modular models and interactive models. Considering findings about the processing of verb argument structure and relative clause attachment, the author concludes that though it is agreed that L1 is influential in L2 sentence parsing, commonalities are also found across L2 learners from all L1 background, such as a general preference for low attachment interpretation. In addition, while L2 speakers are consistently found to use lexicosemantic information in L2 sentence parsing, their use of L2 syntactic knowledge shows mixed results. The author also discusses the role of working memory in L2 parsing, though no unequivocal conclusion has been made due to lack of consensus about the different tests for working memory and difficulty in controlling confounding factors. The author concludes by mentioning that auditory sentence processing is currently neglected in the literature and should be a focus for future research.

## **2.7 Chapter 7 – Sentence processing in L2: Sensitivity to morphosyntactic violations**

This chapter focuses on morphosyntactic processing in L2. The author points out the problem of traditional ways for assessing acquisition based on accuracy, and indicates the advantages of two different types of data: reaction time and brain response. To make clear whether non-native speakers have nativelike sensitivity to morphosyntactic violations in L2, the author summarizes 19 behavioral studies and 14 electrophysiological studies in detail, and finds that while behavioral data shows conflicting evidence which results from method, proficiency, and violation distance, there is greater consistency in neurocognitive data, which supports nativelike morphosyntactic sensitivity in L2 processing.

The author explains the morphological congruence effect from two directions: the linguistic nature of grammatical morphemes and the psycholinguistic functions they serve in language processing. It is pointed out that the difference in grammaticalization of meanings leads to different patterns of semantic encoding and activation in different languages, which in turn results in differences in learning methods and ultimate learning results. In this regard, the author proposes a theoretical model in which the core point is that the difference in the learning and processing of congruent and incongruent L2 morphemes depends on whether a related meaning gets automatically activated and presented at the message level. Jiang supports the feasibility of his proposed model with data from several experiments.

## 2.8 Epilogue

The author introduces his personal feelings about writing this book. His takeaway from this book-writing process is that non-native speakers are essentially different from native speakers. He concludes that there are two major problems in the field of second language processing: 1) a lack of replicability and consistency; 2) a lack of united interpretation for findings. However, the author also affirms the significance of previous studies and proposes a vision for the future.

## 3 Brief comment

Second language processing is an indispensable part of second language acquisition. There are many books on specific fields of L2 processing at multiple levels, but this book is the first to introduce L2 processing systematically, providing a detailed review of significant studies and viewpoints.

Based on cognitive and psycholinguistic perspectives, this book comprehensively reviews and discusses the main concern of L2 processing research in the past forty years – phonological, lexical, and sentential processing. It gives an overall and in-depth interpretation of the psychological mechanisms of L2 processing. The author not only cites a large number of empirical studies to introduce the trends and main findings of each research field, but also sharply points out the characteristics, differences, and deficiencies of relevant research methods, results, and theoretical models, and gives useful suggestions for solutions to the problems. Besides, the book not only contains traditional research based on

accuracy rates, but also has many studies with methods such as self-paced reading tests, eye-tracking, and event-related potentials (ERP), providing evidence based on reaction time, eye movement traces, and brain responses, which is of great significance in revealing the psychological process of L2 processing. In addition, the interpretation of the nature and mechanism of L2 processing in this book is not limited to traditional cognitive and psychological theories, but also incorporates the findings and theories in neurocognition, providing a new perspective for L2 processing. The studies and theories in this book are not based on just one language, but consider multiple target languages and L1 backgrounds, greatly enhancing the validity of the discussion. Likewise, the research focus in the book is not limited to a particular group of L2 learners, but focuses on learners of different ages in different learning environments, revealing the broad range of L2 processing.

However, this book is less perfect because of the following points.

First, the presentation of research evidence is unbalanced. The author has recognized the importance of the neurocognitive perspective in L2 processing, such as from ERP studies, but this type of evidence appears mainly in chapter 7, and can hardly be found in the previous chapters on phonological and lexical processing. This may be due to the fact that neurocognitive methods have a short history in language research, and is not as in-depth as psycholinguistics (Diego-Balaguer and Rodriguez-Fornells 2010). In addition, for neurocognitive methods, the author prefers ERP studies, ignoring fMRI (functional magnetic resonance imaging) or fNIRS (functional near-infrared spectroscopy) research. Though ERP methodology has high temporal precision, it is much weaker in spatial location compared with fMRI or fNIRS technology. Yet to make clear whether there is an essential difference between L1 and L2 processing, technology with high sensitivity to brain anatomy is valuable.

Second, the book lacks an introduction to sub-stages of processing. L2 acquisition is a complex process and L2 processing is a state of development with several sub-phases (VanPattern 2004: 5). VanPattern (2004: 26) divides the basic process of acquisition into three stages: input processing, adaptive reconstruction, and access to output. The three stages are essential and interrelated in the acquisition process. This book does not subdivide the sub-stages of processing, and ignores the relevant longitudinal research, which may be due to the limited length of the book. However, if we want to have a deep understanding of the L2 processing development and mechanism, it is necessary to subdivide the process and examine the relationship between the sub-phases.

Third, the three main research areas are viewed in isolation, without an interactive perspective. The author details the relevant research and theoretical models in the three areas of phonological, lexical, and sentential processing, but

ignores the internal connections between the three. Does the difficulty in L2 processing involve interface knowledge between different language modulars? Sorace (2011) holds that the limited cognitive resources of L2 learners may block their integration of different kinds of information. The Interface Hypothesis (Sorace and Filiaci 2006) argues that it is difficult for second language speakers to learn the structure of interfaces between syntax and other cognitive domains.

Of course, these points are at the same time the ultimate purpose, focus and difficulty of L2 processing research, where future research should put effort on.

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