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ROUTLEDGE

CROSSLINGUISTIC INFLUENCE AND SECOND LANGUAGE LEARNING

KEVIN MCMANUS

CROSSLINGUISTIC INFLUENCE AND SECOND LANGUAGE LEARNING

Crosslinguistic Influence and Second Language Learning provides a comprehensive overview of what is currently known about prior language knowledge and experience in second language learning. Three bodies of research are critically reviewed to achieve this goal: (i) theories of language learning that attribute critical roles to prior experience in explaining second language development, (ii) empirical studies of second language learning that have investigated roles for crosslinguistic influence, and (iii) instructional studies that have supported second language learning by addressing the negative effects of crosslinguistic influence. Using this foundation, new research directions and theorization in the field of second language acquisition are proposed. This book will serve as an excellent resource for students and scholars with interests in (instructed) second language learning, applied linguistics, cognitive psychology, psycholinguistics, and language education.

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For Florence Myles and Richard Waltereit

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1

INTRODUCING CROSSLINGUISTIC INFLUENCE

1.1 Introduction

This book presents a comprehensive overview of crosslinguistic influence in adult second language learning. Succinctly, research about crosslinguistic influence seeks to describe and theorize the ways in which a speaker's cumulative experience with one or more languages can influence their processing and use of other languages. This can include, for instance, the extent to which a speaker's experience with Polish and/or Spanish might influence their use of Mandarin Chinese. In the field of second language acquisition (SLA), researchers have studied crosslinguistic influence in variety of ways, including how first language (L1) experience shapes second language (L2) learning, how L2 learning changes L1 use, as well as how the combined experiences of L1 and L2 learning influence the learning of an additional language (for reviews, see Jarvis, 2016; Jarvis & Pavlenko, 2008; Odlin & Yu, 2016). As we will see, researching crosslinguistic influence in these different ways is necessary for informing how we think about L2 learning, including proposals about the structure and organization of a speaker's language system. It is also one reason why our Polish–Spanish–Chinese example excluded the labels L1 and L2: Crosslinguistic influence is not restricted to L1 effects on L2 learning; it involves understanding all types of experience on language use. The aim of this book is to explore some of the key questions that crosslinguistic influence research seeks to address, including:

- How do adults build knowledge of an additional language?
- Does learning a new language lead to broader changes in a speaker's existing language system or do the systems of L1 and L2 knowledge appear to be unconnected?

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- Might connections among different languages emerge and change over time?
- Can instruction help L2 learners overcome some of the negative effects of crosslinguistic influence?

In terms of situating crosslinguistic influence in the broader context of what we know about L2 learning, theoretical and empirical studies have, for a long time now, attributed critical roles to prior language knowledge and experience in making sense of how adults learn and use an additional language (for reviews, see Gass et al., 2020; VanPatten et al., 2020). This evidence base includes studies of how L2 speakers process and attend to language as well as analyses of what the language input looks like. Together, the findings from these lines of research have led to clear and testable theories about the routes and rates of L2 learning (see Chapter 2) and approaches to L2 instruction that are grounded in how speakers use language (see Chapter 4).

In this book, our aim is to advance new research directions and theorization in the field of SLA by critically reviewing what is known about prior language knowledge and experience in L2 learning.[1] We work toward this goal through a comprehensive review of three connected bodies of research: (i) theories of language learning that attribute critical roles to prior experience in explaining L2 development, (ii) empirical studies of L2 learning that have investigated roles for crosslinguistic influence, and (iii) instructional studies that have been designed to support L2 learning by addressing the negative effects of crosslinguistic influence.

We begin our review by briefly describing what we mean by "language" (Section 1.2), which is followed by a discussion of "learning a second language" (Section 1.3). Here, we note some important debates from the field of SLA about what it means to learn a new language. We then move on to discussing connected issues in crosslinguistic influence research that we will further unpack in subsequent chapters, including "prior knowledge and experience" (Section 1.4), "transfer" (Section 1.5), "cross-language relationships" (Section 1.6), "directions of crosslinguistic influence" (Section 1.7) and "explicit instruction and crosslinguistic influence" (Section 1.8). We end this chapter with an overview of the book.

1.2 Language

It is well known that theories about the nature, forms, and purposes of language are plentiful (e.g., Bybee, 2010; Chomsky, 1965; Tomasello, 2003). Some of these theories contain points of agreement (e.g., learning a particular language requires exposure to that language), but there is also considerable disagreement, including the extent to which some properties of language might be universal and/or innate and what role general cognition might play in the development of language knowledge (for reviews, see Ambridge & Lieven, 2011; Kempe & Brooks, 2016). In this section, our aim is to outline some of the key ideas about language as discussed in this book.

TABLE 1.1 Examples of Constructions in English

Construction	*Examples*
Morpheme	*pre-, -s*
Word	*avocado, fish*
Complex word	*daredevil, shoo-in*
Idiom (filled)	*go great guns*
Idiom (partially filled)	*jog <somebody's> memory*
Ditransitive (double object)	*he wrote her a letter*
Passive	*the cat was chased by the wasp*

This book is grounded in functionalist understandings of language, in which "the surface conventions of natural languages are created, governed, constrained, acquired, and used in the service of communicative functions" (Bates & MacWhinney, 1981, p. 192, see also Christiansen & Chater, 2016; Tomasello, 2003). Under this view, communicating ideas, functions, meanings, and intentions is what drives speakers to learn and use language.

Cognitive linguistic theories propose that the forms of a language that speakers learn and use can be described and conceptualized as CONSTRUCTIONS or form-meaning mappings (Bybee, 2010; Goldberg, 2006, 2019; Tomasello, 2003). A construction can denote a specific meaning (when one form expresses a single meaning; e.g., *avocado*) or sets of meanings (when one form can express more than one meaning; e.g., *-s;* see Table 1.1 for examples). The linguistic form of a construction and its use in communication is built up over time through usage and agreed upon by a community of speakers (Beckner et al., 2009; Christiansen & Chater, 2016). Constructions are therefore socially learned, a process that can lead to changes in the form of a construction (e.g., phonetic reduction, grammaticalization, see Bybee, 2010) and in the meaning of a construction (e.g., constructional change, *will-* "intend" > "future", see Traugott & Trousdale, 2013).

As Table 1.1 shows, constructions can vary in terms of their functional and syntactic complexity and include morphemes, words, complex words, and more abstract syntactic frames (e.g., ditransitives and passives). Constructions can be relatively concrete, as in *fish*, while others can be more abstract. For example, the sentence *she gave Ellie a present* is made up of individual constructions (*she, Ellie, a, present, gave*) that when ordered in this specific way (Subject Verb Object Object) express the meaning of something being transferred (Ellis et al., 2016).

Building on this understanding of constructions as the building blocks of language, the language input that speakers are exposed to and use are a critical source for building knowledge of that language (Ellis, 2006a; Goldberg & Casenhiser, 2008; MacWhinney, 2008). However, exposure to a language alone is not enough. Domain-general learning mechanisms are needed to support the learning of a language (Bates & MacWhinney, 1989; Bybee, 2010; Christiansen & Chater, 2016).

The cognitive mechanisms used by humans to learn language are described as *domain-general* because humans are understood to learn a language in the same ways that they learn any other ability or skill.

Examples of the cognitive mechanisms used by humans to learn and use language include rich memory storage, analogy, categorization, and cross-modal association (Bybee, 2010; Christiansen & Chater, 2016). When speakers encounter instances of language in the environment, for example, categorization is used to match those instances (e.g., sounds, text, images, gestures) to existing experiences with language that are already represented and stored in memory. This process allows messages to be decoded, interpreted, and also for new information to be associated with existing experiences. Our ability to categorize information cooperates with a range of other cognitive processes, including rich memory storage. Work in connectionism indicates that representations are stored and organized in self-organizing maps (Kohonen, 1990; Li et al., 2004; Shirai, 2019), which are networks of representations stored as neurons or units. These networks are activated when input is received and compete for selection based on their specifications and how well they match to the input. Categorization and rich memory storage are just some of the domain-general cognitive mechanisms used by humans to learn language.

In sum, language learning involves the building of language knowledge through exposure to instances of language as used in communication. Language learning is supported by powerful sets of domain-general cognitive mechanisms.

1.3 Learning a Second Language

In discussions of L2 learning in adulthood, we should remind ourselves that all speakers do this with an established system of language knowledge built up from prior experience using some other language (typically L1). This is an important difference between child L1 learning and adult L2 learning. In crosslinguistic influence research, therefore, our goal is to describe and explain in what ways a speaker's prior knowledge of language and experiences using language shape new language learning.

In the field of SLA, research has repeatedly shown that adults regularly construct knowledge about a new language that is different from that built for L1 use (Alonso , 2016; Jarvis & Pavlenko, 2008; Odlin, 1989). Examples of this include instances where the same forms in L1 and L2 (e.g., articles, verb forms) express different or additional meanings. Articles in English (*a, the*) and languages like French (*un* "a", *la* "the"), German (*ein* "a", *die* "the"), and Spanish (*un* "a", *la* "the") are examples of this L1–L2 difference. Even though all these languages can express definiteness or specificity with articles (e.g., *a cat* vs. *the cat* or *eine Katze* vs. *die Katze*), in languages like Spanish and German articles also express information about grammatical gender (e.g., in German *die* "the" is used with feminine nouns, *das* "the" with neuter nouns, and *der* "the" with masculine nouns; Durrell, 2011).

One consequence of this L1–L2 difference is that speakers of Spanish or German, for example, can use articles to anticipate or predict upcoming nouns, but speakers of languages like English that lack grammatical gender do not (Kaan, 2014). This crosslinguistic difference is due to agreement conditions between articles and nouns that are present in languages like Spanish. This means that when Spanish speakers encounter the feminine determiner *la*, for example, they anticipate that the upcoming noun will be feminine as well (*la*$^{\text{-FEM}}$ *manzana*$^{\text{-FEM}}$ "the apple"). Since English nouns are not marked for grammatical gender, English speakers do not carry out the same type of anticipatory processing using words like *the* (but see DeLong et al. (2005) for anticipatory processing with singular definite articles, *a* vs. *an*, e.g., *an airplane* but *a kite*). This example illustrates an instance where the same forms (or cues) in L1 and L2 (articles) do not express the same information and are therefore not used in the same way. Learning situations like this constitute one of the more complex challenges in L2 learning because creating new form-meaning mappings in L2 can compete with existing and established form-meaning mappings in L1 (e.g., the same cue expresses meaning *x* in L1 but meaning *y* in L2).

Even though L1–L2 form-meaning mapping differences can lead to persistent learnability difficulties for L2 speakers, even after considerable exposure to the target language, SLA research has shown that L2 form-meaning mappings that are different from those used in L1 can be learned. In the English–Spanish example, research has shown that English speakers can eventually learn that Spanish articles express grammatical gender, even though English articles do not express grammatical gender (e.g., Dussias et al., 2013). Research evidence like this has come from OFFLINE tests that require learners to produce the grammatical gender of a particular noun. An example of an *offline* test used in this line of research can be found in Hopp (2013), in which four images were presented on a screen and learners were instructed to say aloud each image and its color in German (e.g., *das grüne Auto* "the green car", *die gelbe Karte* "the yellow card"). This test was used to assess whether L2 German learners could produce the correct article with nouns of different grammatical genders (i.e., did the learner use the correct article (*das*) with *Auto*?). This type of test is often described as *offline* because it is not time pressured, which allows speakers to draw on metalinguistic knowledge or other problem solving and reflective abilities to complete the task (R. Ellis et al., 2009). The next step in this research program has involved anticipatory processing tests that are time pressured (or ONLINE). These tests require learners to use or apply their knowledge about the grammatical gender of nouns in real time (i.e., with less preparation time and less time to reflect). In Hopp (2013), learners saw four images on a computer screen and heard a short sentence that included an article cue. Importantly, the article cue contained information about grammatical gender (e.g., *wo is die gelbe Karte?* "where is the yellow card?"). Learners were instructed to look at the image that matched what they heard (i.e., on hearing *wo is die gelbe Karte*, learners should look toward the image of the yellow card). The analysis

examined the speed and accuracy of looks toward the target image using an eye-tracker (for a review of eye tracking in SLA research, see Godfroid, 2019). When test items are carefully balanced for grammatical gender (e.g., only one image out of the four matches the grammatical gender of the stimulus), do learners wait until they hear the noun (*Karte* "card") before looking to the target image or do they look upon hearing the article (*die* "the$^{\text{-FEM}}$")? If the learner looks toward the correct image when the article cue is heard (e.g., *wo is die*… "where is the$^{\text{-FEM}}$ …), this behavior indicates that the learner is engaging in some type of anticipatory processing. Using research designs like this, some studies have shown that English speakers can use gender-marked articles to anticipate upcoming nouns (Kaan, 2014), even though English determiners are not used in this way. These findings indicate that L2 speakers can learn new form-meaning mappings that are different from those used in L1.

Despite such evidence, however, research has showed that not all speakers who demonstrate offline knowledge of a target feature can use this knowledge during real-time performance (Kaan, 2014). This means that speakers might perform well in offline tests that assess knowledge about the grammatical gender of nouns, but that performance in online tests indicates that this knowledge cannot be used in real time. Findings like this have led to proposals that the knowledge L2 learners build might be qualitatively different from the knowledge built and used in L1 performance (for review, see R. Ellis et al., 2009). Here, the main claim is that even though L2 learners appear able to create explicit/declarative and verbalizable knowledge of the L2, such as offline grammatical gender knowledge of nouns, developing L2 knowledge that can be used in more unplanned and spontaneous tasks might be more difficult (e.g., Grüter et al., 2017).

Work in the anticipatory processing of Spanish grammatical gender suggests that it might not be that L2 knowledge is qualitatively different from L1 knowledge, but that other factors related to proficiency and/or experience might play some role (see also Hopp, 2013). For example, Dussias et al. (2013) showed that low proficiency, English-speaking learners of Spanish struggled to anticipate upcoming Spanish nouns using gender-marked determiners in online tests despite demonstrating offline grammatical gender knowledge of Spanish nouns. This evidence suggested that knowledge of grammatical gender in Spanish might have been explicitly learned only, thus making it difficult to for learners to perform well in tasks that require rapid access to that knowledge. However, low proficiency, Italian-speaking learners did appear to be engaging in some type of anticipatory processing in Spanish. One explanation for why the English- and Italian-speaking learners performed differently can be found in how English and Italian use articles with respect to Spanish. In short, Italian marks grammatical gender on articles, but English does not. As a result, Italian speakers can draw on their prior knowledge and experience of using articles to anticipate upcoming nouns, but English speakers have no such knowledge or experience to draw on. Performance from more experienced English-speaking learners of Spanish,

however, did show evidence of anticipatory L2 processing. English speakers likely needed more time and experience using the L2 to develop anticipatory processing behaviors involving articles. This is because English speakers must build knowledge of this new form-meaning mapping from scratch (unlike Italian speakers). In addition, practice and usage are needed to develop this new knowledge for use in real-time processing.

Indeed, research showing that usage and/or practice can lead to the development of more automatic (or fluent) L2 abilities indicates that L2 learners can also build knowledge that is usable in real time (see DeKeyser, 1997, 2017; Segalowitz, 2010). For example, a small number of studies have tracked L2 learners' performance longitudinally to understand the cumulative effects of usage (or practice) on performance (e.g., DeKeyser, 1997; McManus & Marsden, 2019b). This work shows that extensive and repeated opportunities for practice can lead to the development of automatic L2 abilities for target features that are crosslinguistically different. Indeed, this could be one explanation for why Dussias et al.'s (2013) advanced proficiency English-speaking learners of Spanish were able to use their knowledge of grammatical gender in real-time tests while less proficient English speakers showed greater difficulty. More experience processing Spanish article-noun combinations likely played an important role in developing more automatic L2 processing behaviors.

Taken together, research has shown that adults can learn aspects of a new language that are different from L1. Research has also shown that the development of more automatic (or fluent) L2 abilities is possible with practice and experience using the L2. Training studies that track usage longitudinally, of both novel and natural languages, provide the clearest evidence in support of this as well as studies that assess different types of L2 performance (e.g., online, offline). Therefore, even though L2 knowledge can be, at least initially, explicit in nature, increased opportunities for practice and usage can lead to the development of more automatic L2 abilities. Today, these understandings are well represented in current theories of L2 learning (see VanPatten et al., 2020).

1.4 Prior Knowledge and Experience

Up to this point, we have considered some of the conversations taking place in our field about what L2 learning involves, including discussions about the types of language knowledge that learners can build and the extent to which learners are able build and develop L2 knowledge that is different from that used in L1. A key factor here is that experience is critical in developing L2 abilities, both in terms of the prior experience (e.g., L1) that speakers bring to L2 learning as well as the experience that the learner has with using the L2. Both types of experience are important. In this section, we consider the prior experience that speakers bring to L2 learning.

As previously noted, most adult speakers begin L2 learning with an established system of language knowledge. This description acknowledges that prior to

learning a new language most adults are accomplished and expert users of at least one language, often their L1, but sometimes other languages too (De Houwer & Ortega, 2018). This is an important difference between child and adult language learning that SLA research seeks to account for. By accomplished and expert user, we are saying that almost all adults can use their L1 (and/or other languages) without needing too much planning, they can tell when something does not seem to make sense or sound right (even if they cannot identify why), and they can do all of this relatively quickly while often undertaking other tasks (e.g., having a conversation while walking down the street, see Segalowitz, 2010).[2] At the same time, adults can use their L1 in a very deliberate and/or reflective manner. For instance, maybe careful planning is needed because of the delicate nature of the conversation topic, perhaps somebody asked the speaker for directions to an unfamiliar location, or maybe a conversation triggered an idea or memory about something else, all of which could lead a speaker to be more reflective and/or hesitant in how they use their language(s). This expertise in using language both very deliberately and relatively automatically is the culmination of a lifetime of daily language use, which has developed, fine-tuned, and committed the speaker's cognitive mechanisms for the optimal use of that language (Christiansen & Chater, 2016; Ellis, 2006a; MacWhinney, 2008).

These observations about language use that adults bring to the task of learning something new are important for understanding L2 learning. This is because adults who begin learning an additional language do so after having already learned and mastered many complex ideas and concepts about the world as well as how these ideas and concepts are communicated in the language(s) they use. For example, almost all adults will have learned and mastered some understanding of the concept of *time* (e.g., pastness, futurity, see Comrie, 1985; Klein, 1994) as well as the ability to express and comprehend different locations in time as expressed in their language(s). This ability includes an understanding that, in English, *she played tennis* and *she is playing tennis* express different locations in time with reference to the speaker. So, we are saying that to comprehend information about time as expressed in these utterances, the English speaker needs some type of knowledge about the linguistic cues used in English to express time. In our example, this is knowledge that grammatical information expressed on English verbs can tell us something about time (e.g., *-ed* to indicate past time). Not only do most adults develop expertise like this for their language(s) (i.e., knowledge of the most informative cues and the meanings they index), but this is an ability that can become well-rehearsed, automatic, and established with usage or practice (Anderson, 1982; DeKeyser, 2017; Segalowitz, 2010). In short, greater experience with language can optimize language use.

If we apply these understandings to L2 learning, it can help us to make sense of why a large body of research has repeatedly shown that the cumulative experience of using and attending to a particular language (e.g., L1) can majorly influence the learning of an additional language, positively and negatively. The effects

of prior knowledge and experience on L2 learning can be positive (or facilitative) when the patterns of language use are similar across languages, such as when languages share sets of meanings/concepts (e.g., time, aspect) and/or express the same meanings/concepts using similar means (e.g., expressing differences in time with verbal inflectional morphology, as in English and German, see Comrie, 1985). SLA research has indeed shown this to be the case: L2 learning can be easier when L1 and L2 express the same concepts using similar linguistic means (Jarvis & Pavlenko, 2008; Odlin, 1989).

On the other hand, prior knowledge and experience can complicate L2 learning when languages differ in specific ways, including when shared concepts are expressed differently. For example, even though English and Mandarin Chinese share understandings of the concept of time, these languages do not *express* time in the same ways (Klein, 1994; Klein et al., 2000). For example, English can express temporal reference using verbal morphology (e.g., *she is watching TV* vs. *she watched TV*), but Chinese uses other means such as temporal particles (e.g., *le*, *zhe*, *guo*), discourse principles, and lexical means. For the Chinese-speaking learner of English, therefore, even though it is helpful that L1 and L2 share a conceptual understanding of time (thus not requiring new conceptual learning), the Chinese speaker's prior L1 knowledge and experience for how to express time is less helpful. The Chinese speaker has to learn new and different ways for expressing this concept in L2 (i.e., that inflectional morphology on English verbs can provide information about time). L2 research has repeatedly shown that L2 learning can be more difficult when L1 and L2 express the same meanings/concepts differently (Jarvis & Pavlenko, 2008; Odlin, 1989).

In addition to documenting crosslinguistic differences/similarities in usage and their impact on L2 learning, we also want to understand why prior knowledge and experience has the effect that it apparently does. For example, even though there is research evidence that the negative effects of crosslinguistic influence can be fleeting in some cases but longer lasting in others, few accounts of L2 learning agree on explanations for these findings (Lardiere, 2009; MacWhinney, 2005; O'Grady, 2015). Frequency and exposure to language input can go a long way to explaining some of these findings, but frequency-based explanations by themselves are not sufficient (see Divjak, 2019; Ellis, 2006a). Accounts that attribute additional roles to how speakers use and process the input provide increasingly robust insights into how L2 learning unfolds (e.g., Ellis & Sagarra, 2010, 2011). Indeed, this makes good sense not only because adults bring powerful sets of cognitive learning mechanisms to the task of constructing language knowledge (categorization, chunking, rich memory storage, analogy; see Bybee, 2010; Ellis & Robinson, 2008), but also because these learning mechanisms have already been committed to the task of efficient and effective L1 use. This means that L2 speakers begin learning a new language with cognitive mechanisms that have been optimized for processing and using a different language. How speakers attend to and process new linguistic input is therefore influenced by prior experience. This

is one reason for why some of the negative effects of crosslinguistic influence can be fleeting in some cases but more persistent in others. It all depends on what experience learners bring to L2 learning. As a consequence, advancing multifactor accounts of learning that are both sensitive to the input and how prior experience biases processing are critical for understanding crosslinguistic influence and learning more generally.

1.5 Transfer

In addition to the labels "prior language knowledge" and "experience", TRANSFER is also a commonly used term in discussions and explanations of L2 learning. Readers familiar with SLA research will be aware that transfer is often used to describe and/or explain L2 performance that appears to be influenced by, draws on, or uses some type of prior language knowledge (e.g., L1) in the learning and use of a new language. Odlin (1989), for example, defines transfer as follows:

> Transfer is the influence resulting from the similarities and differences between the target language and any other language that has been previously (and perhaps imperfectively) acquired
>
> *Odlin, 1989, p. 27*

In this definition, Odlin sees transfer as an outcome or a result of the linguistic differences and similarities among a speaker's languages (see also Anderson, 1983; Kellerman, 1995). Indeed, reviews of the field have indicated that this has been an influential way to think about transfer (see Gass et al., 2020), which has led to the development of methodological frameworks for identifying instances of transfer (e.g., Jarvis, 2000, 2010). At the same time, however, it has been noted that very little is known about what transfer actually is (e.g., Jarvis & Pavlenko, 2008; Odlin & Yu, 2016; Sharwood Smith & Truscott, 2006, 2014). This is a problematic state of affairs for our field for many reasons, not least because transfer is a common description and explanation for L2 learning. One consequence of this is that we can identify instances of transfer, but we do not fully understand what triggers or leads to transfer.

One (common) interpretation of transfer is that it involves copying and/or cloning one body of knowledge (e.g., L1) to create a new body of knowledge (e.g., L2). This interpretation, as Sharwood Smith and Truscott (2006, 2014) have discussed, has its roots in the "every day" interpretation of what transfer is (e.g., "transferring water" is interpreted as moving water from one container to a different container), but with some modification because transfer in L2 learning cannot mean that L1 knowledge is moved to a different place:

> The essential problem is that transfer, in the everyday sense of moving something from one location to another, does not make immediate and

> obvious sense. The L1 elements that are supposed to be imported into an L2 do not leave the L1 and automatically impoverish it. Hence, the closest we can get to this conceptualisation is to say "transferring" something must mean "copying" or "cloning" it, leaving the original in place.
>
> *Sharwood Smith & Truscott, 2006, pp. 202–203*

By interpretating transfer in terms of copying L1 knowledge, this allows the L1 system to stay intact. L2 knowledge (i.e., a copy of L1 knowledge) is then hypothesized to be modified through exposure to L2 input (see Schwartz & Sprouse, 1994, 1996, 2020). In this view, instances of negative transfer are explained as L2 knowledge that has not yet been fully modified. Even if we accept this conceptualization of transfer as a process of copying and restructuring, there are still many questions about transfer: How is transfer triggered? Do changes to transferred knowledge also affect the source (e.g., L1)? Could there be some type of exposure threshold or processing difficulty that triggers transfer? Does the copy-and-restructure conceptualization of transfer entail that L1 knowledge is separate from L2 knowledge? In short, given that transfer is a common label used in descriptions and explanations of L2 learning, it is problematic that we understand so little about it.

In this book, we both problematize the copy-and-restructure conceptualization of transfer and consider an alternative account for the effects of transfer (or crosslinguistic influence). In particular, we explore whether crosslinguistic influence can be explained more simply as the use of existing language knowledge to process new information (e.g., the use of L1 knowledge to interpret and produce L2 cues). In line with conceptualizations of transfer from cognitive psychology (Anderson, 1982; Larsen-Freeman, 2013; Nokes, 2009), this view does not require knowledge to be copied and subsequently restructured. Instead, L2 learning involves (i) the creation of new knowledge when L1–L2 differences exist and (ii) the creation and/or development of selection mechanisms to manage and select among competing knowledge sources in L1 and L2 (McManus, 2021). This conceptualization of crosslinguistic influence is informed by work in emergentist accounts of L2 learning (e.g., O'Grady 2013, 2015) and language selection (Green, 1998). Explaining crosslinguistic influence in this way means that we also need to be able to explain (i) when and how new language knowledge is constructed, (ii) how L1 and L2 knowledge sources are connected, (iii) how knowledge sources in L1 and L2 are selected, and (iv) what the learning processes are that give rise to the creating of language knowledge and its selection. In this book, we focus on these questions while exploring others related to them.

1.6 Cross-language Relationships

Perhaps one of the most frequently asked questions in SLA – but one that has been shown to be one of the difficult to investigate – is to what extent a speaker's

(knowledge of) different languages might be connected, and, if so, in what ways are the languages connected. Indeed, the preceding discussion highlighted that a copy-and-restructure view of transfer suggests that L2 learning leads to the creation of a new body of language knowledge. Whether these bodies of knowledge are connected or not is not well understood. L2 knowledge that (i) appears different from that used in L1 performance and (ii) can be used efficiently and relatively automatically likely indicates that a speaker's L1 and L2 knowledge sources coexist (Hartsuiker & Pickering, 2008; Kroll et al., 2002; Sanoudaki & Thierry, 2014). That is, L2 learning does not appear to erode or replace L1 knowledge (although extensive L2 use has been argued to lead to convergence of L1 and L2, see Dussias & Sagarra, 2007). Indeed, as we have seen, a dominant proposal in the field is that L2 knowledge begins as a clone of L1 knowledge and that this newly cloned language knowledge can be modified through exposure to input over time to facilitate L2 processing and use (see MacWhinney, 2005; Sharwood Smith & Truscott, 2006, 2014). This account suggests that learners manage multiple language systems from the outset. Indeed, in a review of this research, Kroll et al. (2012) refer to the ability to manage multiple languages as "mental juggling". Comparisons of L1 and L2 performance in the same speakers can provide support for claims that L1 and L2 knowledge representations coexist (Kang et al., 2018; McManus, 2021; Timmer et al., 2019).

Research investigating these questions additionally suggests that a speaker's other known languages are active to some degree when one of them is being used (for reviews, see Kroll & Bialystok, 2013; Kroll et al., 2015), meaning that L2 users cannot/do not switch off the language not in current use (Chen et al., 2017; Dijkstra, et al., 2000). The use of event-related potentials (ERPs) to provide an account of brain activity during language use has made an important contribution to this understanding. In Chapter 3, we discuss work by Thierry and Wu (2007) that investigated activation of L1 knowledge during L2 comprehension. Briefly, Thierry and Wu (2007) presented Chinese-speaking learners of English with pairs of English words (e.g., *post – mail*, *train – ham*). Half of the words concealed a character repetition when translated into Chinese and half did not. The authors reported an effect of concealed character repetition on L2 performance, indicating that L2 speakers were sensitive to Chinese character repetition even though they were reading English words. These results indicate not only complex relationships between a speaker's L1 and L2 knowledge sources, but, importantly, they suggest activation of L1 knowledge during L2 comprehension. Findings such as these are important for informing how we think about the potential connections among a speaker's different languages. They suggest that a speaker's knowledge of other languages is activated when only one language is being used.

Given that interest in this type of research is growing and our understanding of cross-language relationships is developing, SLA theory has sought to explain how a speaker's language system might allow for co-activation. In other words, how does evidence about cross-language activation inform theorization about

the organization of a speaker's system of language knowledge? For example, work in connectionism indicates that new language knowledge becomes integrated and connected with networks of existing language knowledge (Shirai, 2019). Knowledge representations in L1 and L2 are therefore understood to be independently represented but connected via complex networks involving different layers of linguistic form and/or conceptual meaning (Gasser,1990; Shirai, 2019). This close network of connected language representations is one explanation for co-activation during language use.

Because L2 speakers are understood to be constantly managing (or "juggling") multiple languages during their use of a single language and because L1 and L2 representations appear to be closely connected and tightly networked at multiple levels of representation, an additional consideration in this line of research has investigated the extent to which some type of cognitive process or mechanism might be involved in how speakers select a specific language. The question here is as follows: to what extent must L2 speakers employ or develop some type of cognitive mechanism that permits specific types of language knowledge to be selected/used (Calabria et al., 2018; Green, 1998). In other words, can a speaker select or inhibit a particular language at a given time?

The area of research investigating this question is known as LANGUAGE CONTROL. It is based on the understanding that, for multilinguals, the creation of L2 representations are, by themselves, not sufficient for the appropriate use of that language: "Learners of an L2 need to learn how to keep the two languages separated to avoid interference, and learn to select one language or the other in each given communicative situation" (Calabria et al., 2018, p. 221). To illustrate: For an English-speaking learner of German, recognition of a specific ordering of letters in reading (e.g., *R-O-C-K*) activates multiple candidate interpretations in the speaker's languages (i.e., English, German), such as a genre of music (as in "rock music"), the naturally occurring mineral material (as in "sedimentary rock"), or a piece of clothing (as in *das Rock*, "skirt"). This activation of multiple candidate interpretations results in competition. The question here is how do speakers manage and select among these different candidate interpretations? In other words, how do L2 speakers manage the conflict (or competition) that comes with knowing multiple languages?

One approach to addressing this question involves INHIBITION or INHIBITORY CONTROL (Abutalebi & Green, 2007; Green, 1998; Green & Abutalebi, 2013), an important cognitive mechanism understood to help manage cross-language behavior by preventing selection of the inappropriate language during language use (Miyake et al., 2000; Stahl et al., 2014). One influential model of inhibition is Green's (1998) Inhibitory Control Model (see Chapter 2). In a nutshell, Green (1998) proposed that language representations are tagged according to language (e.g., L1 tags for L1 representations, L2 tags for L2 representations) and that inhibitory control mechanisms facilitate use of a particular language by using language tags. Language use is facilitated by inhibiting dominant or competing responses

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Bybee, J . (2010). Language, Usage and Cognition. Cambridge University Press.

This volume presents a clear and accessible introduction to usage-based linguistics, particularly recommended for readers with interests in the connections among language and cognition. Perhaps one of the most useful aspects of this book is that it introduces a variety of cognitive processes (e.g., memory, chunking, analogy) and systematically explores how these processes shape language structure and use.

Cadierno, T. , & Eskildsen, S. W. (Eds.). (2015). Usage-Based Perspectives on Second Language Learning. De Gruyter.

The authors of this edited volume bring together a variety of empirical studies and critical reflections on usage in L2 learning and teaching. The book offers accounts on the role of frequency and exposure in L2 learning, the development of interactional and constructional competence, as well as how ideas about usage-based linguistics can be used in language teaching.

Divjak, D . (2019). Frequency in Language: Memory, Attention and Learning. Cambridge University Press.

Divjak presents a critical overview of language learning research, drawing attention to critical insights from experimental and corpus-based work as well as some of the challenges that lay ahead in understanding cognition and language learning. One very useful aspect of this book is that it presents a clear and accessible account of usage-based approaches to understanding language structure, language learning, and language use.

Ellis, N. C. , Römer, U ., & O'Donnell, M. B. (2016). Usage-Based Approaches to Language Acquisition and Processing: Cognitive and Corpus Investigations of Construction Grammar. Language Learning 66(s1), 1–358.

In this book, Ellis and colleagues describe a series of empirical studies about the acquisition and processing of language by L1 and L2 users. The collection brings together a number of critical insights about what the language input looks like, how learning and use unfold, and how the two work together.

Leow, R. P. (2015). Explicit Learning in the L2 Classroom: A Student-Centered Approach. Routledge.

This book presents a comprehensive overview of explicit learning in the classroom. The author provides an approach that is grounded in theory, empirical research findings, methodological perspectives, and model-building. Of particular interests to readers of the current book, Leow focuses on awareness and attention in L2 learning, including conceptual elaboration of these key learning processes, as well as ways in which they can be studied in L2 research.

Porte, G ., & McManus, K . (2018). Doing Replication Research in Applied Linguistics. Routledge.

This book presents a step-by-step guide to carrying out replication studies in the field of applied linguistics. It is written in a user-friendly manner that requires no previous knowledge of replication.

Roehr-Brackin, K . (2018). Metalinguistic Awareness and Second Language Acquisition. Routledge.

Roehr-Brackin presents an in-depth overview of metalinguistic awareness in the field of SLA. This topic is addressed both in terms of child and adult language learning and provides a methodological synthesis for assessing and measuring metalinguistic awareness. In addition, the place of metalinguistic awareness in language education is discussed.

Segalowitz, N . (2010). Cognitive Bases of Second Language Fluency. Routledge.

This book explores fluency from a range of perspectives in L2 learning. In addition to discussing the methodological aspects of fluency, cognitive and neural correlates of fluency, as well as speech production and automaticity, this book provides L2 researchers with important information about a variety of processes in language learning.

Shirai, Y . (2018). Connectionism and Second Language Acquisition. Routledge.

Given that connectionism is a key area of current L2 research, this book will be an important source of information for readers with interests in cognitive science and language learning.

Tokowicz, N . (2014). Lexical Processing and Second Language Acquisition. Routledge.
This volume provides a comprehensive review of research on L2 lexical processing. Although some of this research was discussed in the current book, Tokowicz provides a fuller account that focuses more squarely on vocabulary both in terms of theory and empirical research.
Tyler, A. E. , Ortega, L. , Uno, M. , & Park, H. I. (Eds.). (2018). Usage-Inspired L2 Instruction: Researched Pedagogy. John Benjamins.
This edited volume brings together a variety of theoretical and empirical papers involving usage in language teaching. In addition to discussions about why and how usage can be integrated into the classroom to inform language teaching, the different chapters explore specific types of usage that appear to be the most useful (e.g., corpus).
Yu, L. , & Odlin, T. (Eds.). (2016). New Perspectives on Transfer in Second Language Learning. Multilingual Matters.
Yu and Odlin bring together a variety of empirical studies and conceptual reviews of work in transfer in the field of SLA. This timely volume points to new and emergent directions in transfer research involving a range of understudied languages (e.g., Hindi, Tamil).
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