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Theoretical Foundations

Second language acquisition (SLA) is the acquisition of a language after the grammatical foundations of the native language are in place, typically after four years of age. It is very common around the world to learn a second language in a classroom or institutional setting. Our goal in this textbook is to discuss how the linguistic knowledge that second language learners develop can be guided and positively affected by instruction. To achieve this goal, in this textbook we focus on **intervention** research. We begin with an overview of major topics in linguistics and in second language acquisition that are particularly relevant to research with instructed second language learners. The focus of this textbook is on experimental studies of second language acquisition in the classroom or in a lab environment, where aspects of the **input** are manipulated to enhance the acquisition of specific grammatical forms. Depending on the study, this may be achieved through, for example, explicit explanations about grammatical forms, use of different instructional methods, or exposing learners to specific grammatical forms. These types of experimental studies are called **intervention studies** because linguistic knowledge is measured before and after the input manipulation (the intervention), to see whether there was a change (an effect) as a result of the intervention.

Our primary objectives in this book are three:

1. to inform current and future language teachers about findings from second language acquisition (variously termed **L2 acquisition** or **SLA**) and classroom intervention research that are relevant to language teaching;
2. to inform students and researchers working in the field of classroom intervention research about SLA findings that can potentially lead to classroom intervention research studies; and
3. to give students and researchers of SLA the foundational knowledge and tools they need to carry out intervention research studies.

We envisioned this book as a resource both for students of SLA who are interested in learning more about classroom intervention research and for

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current and future language teachers who are interested in learning about theoretically informed classroom intervention research beyond the basics. For a more introductory coverage of these topics, see Henshaw & Hawkins (2022).

Before we get to the specifics of how intervention studies work (see Chapter 2), we lay out the underlying assumptions and the central concepts of formal approaches to second language acquisition that we adopt in this book.

1.1 Linguistics and Second Language Acquisition

What is a language? How does one learn a language? Does **first language acquisition** proceed in the same way as second language acquisition, or are the two processes different? Do children learn the same way as adults? Does learning two languages simultaneously differ from learning first one language and then another? Does your knowledge of one language influence how you learn a new language, and if so, how? These are just some of the questions that researchers who work in linguistics and language acquisition often ask. In this section, we review some of the key terms and findings about language and language acquisition, to set the stage for studies about instructed SLA, the focus of this book.

1.1.1 What Is Linguistics?

Linguistics is a science that studies the nature of human language: its form (grammar) and function, its representation in the brain, and its use in society. In this textbook we are concerned with the knowledge of language represented in the mind of both first language (L1) speakers and learners of a second language (L2). In particular, we focus on how grammatical knowledge is acquired in the first place, how it develops further over time by itself and with the help of instruction, and how it is represented and used for production and comprehension during this process. We are concerned with grammar as an abstract cognitive system that develops in the minds of speakers. Before we proceed, there are other interpretations of grammar that we need to clarify. The term **prescriptive grammar** refers to a set of norms or rules governing how a language should or should not be used rather than describing the ways in which a language is actually used by speakers. It is also called **normative grammar** because it tries to impose the “norms” of the language. **Pedagogical grammar** is a grammar which is intended to teach second language learners; it is informed by scientific descriptions of language and theories of second language acquisition (Newby, 2000).

Although there are many branches of linguistics, in this textbook we will be mostly concerned with aspects of **morphology** (the structure of words), **syntax** (the structure of phrases and sentences), and **semantics** (the meaning of words and sentences) that are challenging in SLA. The vast majority of instructed SLA research has focused on grammar (morphology and syntax), and most of the literature on theoretical aspects of SLA focuses on formal aspects of syntax and morphology. This book focuses primarily on intervention studies of syntax, morphology, and sentence-level semantics. Intervention studies of phonology, vocabulary (words in isolation) and pragmatics fall beyond the scope of this book.

The approach to linguistics we favor in this book is the Chomskyan model of language that sees aspects of language as universal, common to all human languages, and part of inborn grammatical knowledge represented in the mind (Chomsky, 1965, 1986). **Universal Grammar (UG)** is a cognitive construct that is assumed to constrain the form of all languages. UG limits the hypotheses that child L1 learners entertain as they acquire the language spoken (or signed) in their environment on the basis of input. UG includes **principles** or general rules, such as constraints on the referents of pronouns (like *she/her*, *he/his*, *they/them*) and reflexive anaphors (*herself*, *himself*, *themselves*). UG also includes **parameters**, which capture crosslinguistic variation. An example of a parameter, the verb-movement parameter (Pollock, 1989), determines where verbs are placed in the sentence (before or after adverbs, before or after the subject in a question, etc.). This parameter is discussed in Chapter 4. UG also accounts for other universal properties of language. Chapter 7, for example, discusses a syntactic distinction between different types of **intransitive verbs**. This distinction is universal but shows different syntactic and morphological reflexes in different languages.

Figure 1.1 illustrates how the construct of UG guides the L1 acquisition process from initial state, throughout development to the final, steady state: mature native speaker competence. The input consists of naturalistic samples of speech (or sign) in the first years of life.

We favor the generative Chomskyan perspective because the **generative linguistic framework** (Chomsky, 1965) considers grammar as a complex abstract system. This approach provides a rich research base on the syntax, semantics, and morphology of many languages around the world, and on the second language acquisition of many of these languages (L. White, 2003b), including English, Spanish, Japanese, Russian, among many others. This approach has always asked how human language is learned by children acquiring their L1 and what form the **linguistic competence** (underlying knowledge) of both child and adult speakers of a language takes (Chomsky, 1986). Therefore, language acquisition is at the center of the generative

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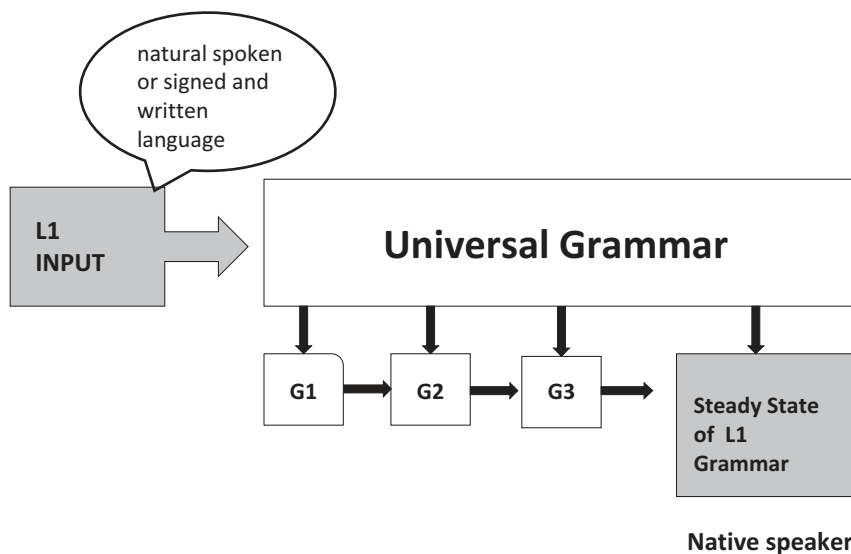


Figure 1.1 L1 acquisition from initial state to mature steady state (based on L. White, 2003b, p. 3)

theory of grammar. Finally, the learnability questions raised by how children acquire or discover the rules of the grammar of their L1 from exposure to input are also relevant in L2 acquisition and in bilingual acquisition by heritage speakers.

Since the mid 1980s, the generative approach to L2 acquisition has generated a vast body of work on the acquisition of various grammatical aspects of diverse languages. Some of these studies include instructed interventions in the classroom, such as the famous study on adverb placement in English conducted by L. White (1991), which we discuss in Chapter 4. Furthermore, guided by questions about the role of age of acquisition, several studies of heritage language speakers in linguistics and applied linguistics have been conducted since the early 2000s. Since heritage speakers are an increasingly visible and important population in many foreign/second language classrooms, some of the incipient research in this area has compared what heritage language speakers and L2 learners have in common when it comes to learning the target language, and whether formal instruction affects their grammatical development differentially. Some of these studies include instructed interventions, such as studies by Potowski, Jegerski, and Morgan-Short (2009) on the subjunctive discussed in Chapter 6 and by Montrul and Bowles (2010) on object marking covered in Chapter 8. Although not all the studies examined in this book assume the generative framework, they all deal with grammatical properties of English, Spanish, and other languages that have had a long research tradition in generative linguistics.

1.1.2 Second Language Acquisition: Timing and Context

As mentioned in the opening of this chapter, second language acquisition is the acquisition of an additional language after the structural foundations (i.e., basic grammar) of the L1 are in place. The term *second* implies a sequence: first one language, then the other. Therefore, L2 acquisition (or SLA) can happen early in childhood (after age three), later in childhood (elementary school), at or around puberty (secondary school), or at any age in adulthood. There are several differences between L1 acquisition by children and L2 acquisition by children and adults. One major difference is the learner's age: by definition, an L2 learner who has already had time to acquire one language is older than an L1 learner who is just beginning the language acquisition process. Another major difference is the initial state of the acquisition process. For the L1 child, the initial cognitive state at the onset of L1 acquisition is UG (see Figure 1.1) or, on non-generative views, general cognition. In contrast, L2 learners already start with the linguistic knowledge of their L1 and may or may not, depending on the theory, have access to aspects of UG as well. Figure 1.2 illustrates our representation of the Full Transfer/Full Access model of L2 acquisition (Schwartz & Sprouse, 1996); we include a role for instruction. In this model, the initial state of L2 acquisition is the mature L1 knowledge already developed through UG, as in Figure 1.1. UG remains available from initial state to the final state of the interlanguage development. The endstate of L2 acquisition can be near-native or nonnative in different aspects of grammar.

L2 acquisition can happen naturalistically, as in L1 acquisition, or in a formal, instructed environment (the classroom). Thus, Figure 1.2 shows that the input to L2 learners may potentially include naturalistic speech and written language, as well as classroom instruction, which includes grammar

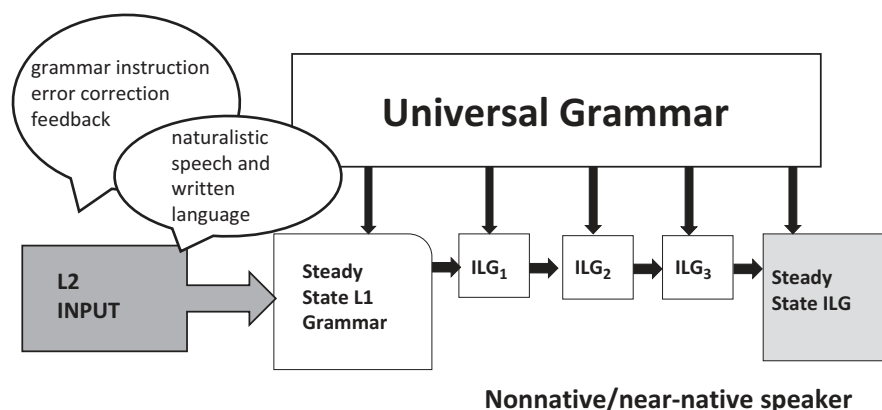


Figure 1.2 A representation of the Full Transfer/Full Access Model of Universal Grammar in L2 acquisition (Schwartz & Sprouse, 1996) with a role for instruction (adapted from L. White, 2003b).

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explanations, error correction, and other forms of feedback. The context of acquisition depends on the age of the L2 learner and their sociolinguistic circumstances. Many L2 children are children of immigrants (heritage speakers of their native language) who come to a new country where a different language is spoken and who must learn the L2 naturalistically in the society and at school through academic instruction in the L2. Both adult and child immigrants often take formal classes in which they are instructed about the structure of the L2. Children and young adults who are not immigrants typically have foreign-language instruction at school (in cases where the school offers L2 instruction) or in after-school programs. Exactly when such foreign-language instruction begins at school depends on the country. For example, in the United States, most L2 learners start acquiring their L2 at around puberty, since foreign-language education typically begins in middle school or high school, or in young adulthood, at university. In contrast, in many other countries all over the globe, foreign-language instruction begins as early as elementary school.

In most cases, L2 learners continue to be exposed to their L1 while receiving exposure to their L2; this means that the amount of input that the L2 learner is exposed to is significantly less than the amount of input that an L1 acquiring child in a monolingual setting receives daily. In some instructed settings, exposure to the L2 may be two to five hours a week, as in a foreign-language environment. On the other hand, for a learner who lives in the country where the L2 is spoken (e.g., a learner of English in the United States), exposure to the L2 can be several hours a day. In some cases, L2 exposure may even occur 100 percent of the time (if the learner has no interaction in their L1).

1.1.3 Heritage Speakers: In between First and Second Language Acquisition

Many L2 learners living in a second language environment all over the world are also heritage speakers of their L1. As we will see, some recent intervention studies have included heritage speakers. This is because the L1 or heritage language of these speakers does not develop fully by the time these children become adults. On the surface, many grammatical areas that are difficult for L2 learners to master are also not fully mastered by heritage language learners. Intervention studies with heritage speakers may seek to answer theoretical questions about the nature of linguistic knowledge and/or to identify how heritage speakers learn or which strategies help them relearn their native language in a classroom environment. Figure 1.3 captures the fact that heritage speakers share some situational and some linguistic features with both L1 and L2 acquisition (see also Table 1.1).

Table 1.1 Input differences between monolingual child L1 learners, heritage language L1 learners, and L2 learners

Input	Monolingual child L1 learners	Heritage language L1 learners	L2 learners
Timing	birth	birth	early (age 4–10), late (around and after puberty)
Setting (in the early stages)	naturalistic (home)	naturalistic (home)	instructed (classroom)/naturalistic (study abroad, immigration)
Mode	aural (birth–age 4) written (after ~age 4–5)	predominantly aural (literacy in some cases)	aural and written (literacy)

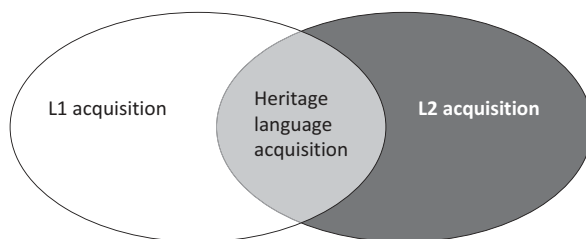


Figure 1.3 Heritage language acquisition

Most heritage speakers are early bilinguals whose L1 is a sociopolitically minority language in the society (Polinsky, 2018). Some heritage speakers are born to immigrant parents or immigrate to an L2 environment in childhood. Others grow up in bilingual or multilingual societies where their home language is one historically spoken in the community (Basque, Frisian, Balochi) or an indigenous language (Quechua, Sami). Some heritage speakers are **simultaneous bilinguals** who are exposed to the heritage language and the society language from early childhood, thus having two L1s. Other heritage speakers are **sequential bilinguals** who have experienced some years of monolingualism in the heritage language (the L1) prior to immersion in the society language (the L2). Figure 1.4 depicts the linguistic development of simultaneous bilinguals, exposed to two languages (A and B) since birth, also guided by UG.

While many heritage speakers become native-like in the majority language of the society as they assimilate to the society, their **heritage language acquisition** is often interrupted. This leads to the heritage language not reaching the same level of development as in monolinguals or the same level as the majority language. The result is what has been termed delayed, partial,

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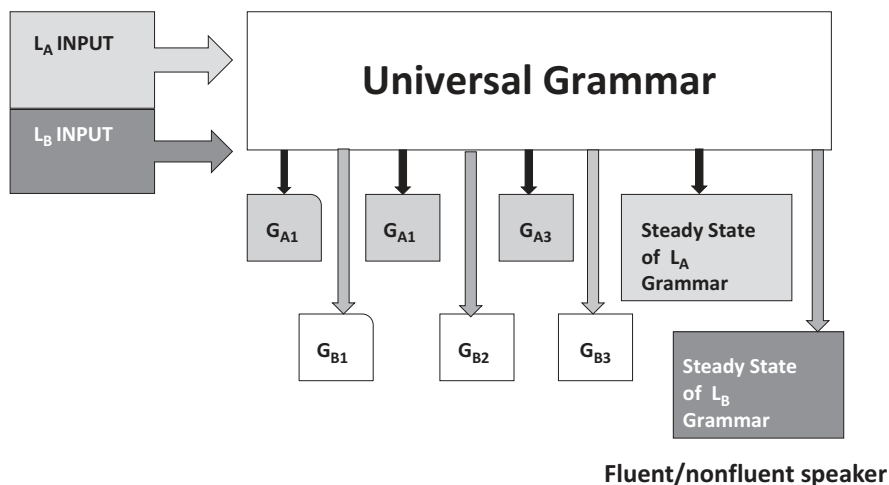


Figure 1.4 Simultaneous bilingual acquisition

or incomplete acquisition of the heritage language (Montrul, 2008, 2016a, O’Grady et al., 2011, Polinsky, 2007, Silva-Corvalán, 2018). Although heritage speakers are native speakers of their home language, many of them do not use the language outside the home after age five, when schooling in the majority language typically starts. Significant reduction of input and decreased use of the language between the ages of five and eighteen years often profoundly hampers the lexical and structural development of the heritage language. Table 1.1. compares monolingual child L1 learners, heritage language L1 learners, and L2 learners with respect to timing and nature of input received.

Many child heritage speakers fall behind in the linguistic development of their L1 (their heritage language) compared to monolingual children of the same age (Daskalaki et al., 2020; Montrul & Sánchez-Walker, 2013). They may even fall behind relative to younger monolingual children (Armon-Lotem, Rose, & Altman, 2021; Coşkun Kunduz & Montrul, 2022). Heritage speakers are native speakers of the heritage language because they were exposed to the language naturalistically at home from birth, like monolingual L1 learners. Yet, in later childhood and adulthood they show many of the nonnative features typical of second language learners. These are observed in the areas of morphology (Montrul, 2008; Polinsky, 2018), some aspects of syntax (Lohdal, 2021) and some aspects of semantics (Ionin, 2021). In general, heritage speakers pattern more closely, yet not always identically, to monolinguals in phonology (C. Chang, 2021). As adults, many heritage speakers seek to learn or relearn the heritage language in the classroom. While some institutions offer classes and language programs specifically

tailored to the linguistic and communicative needs of heritage speakers, most others place heritage speakers in the same classroom as L2 or foreign-language learners. In the last few years, classroom-based research on heritage language learners has become critical to understanding how different types of learners react to or benefit from explicit instruction to help them advance in their linguistic development (Bowles & Torres, 2021; Montrul & Bowles, 2017).

1.1.4 Biological Foundations of Language

Although language is a system of human communication that takes place in a sociocultural environment and expresses different meanings, in this textbook we are concerned with the form of language – its grammar – as instantiated in the minds of speakers, including language learners. How is language, in our case, grammatical knowledge, acquired? Following the Chomskyan approach to language, we assume that language is in the mind, and that without cognition and the biological foundation of language, there is no language. In essence, all human beings are biologically endowed with a cognitive capacity that allows them to develop language. Therefore, the biological component is essential: Human beings develop an abstract, symbolic, generative system of rules that creates new sentences from a finite set of elements (words) to communicate meaning. In contrast, other biological organisms do not develop a complex and abstract language system capable of communicating knowledge and expressing meanings about past, future, or hypothetical events.

But in order to acquire language, a learner must be exposed to samples of language in the environment, in a social context through interaction with other speakers. This is very similar to what happens in the botanical world: Plants are born from a seed (a biological program), but in order to grow to their full potential they need optimal amounts of water and sunlight (environmental triggers). Turning to the animal world, many birds, such as zebra finches, acquire their singing ability between twenty-three and sixty-five days after hatching, by imitating a member of their species (Gobes, Jennings, & Maeda, 2019). Introduction of a second bird “tutor” after Day 65 results in limited song learning. In a similar manner, input in the form of exposure to language through spoken (or signed) and written language samples is a critical component for language development.

Like the zebra finch, if a child is not exposed to language input (oral in case of spoken languages and signed in the case of sign languages) during the critical period for language, the morphology, syntax, and semantics of the native language are not acquired (Curtiss, 2014). This is just as true for hearing children deprived of spoken language as for deaf children deprived

of sign language (Mayberry, 2012). Mayberry and Kluender (2018) argue that there is a critical period for L1 acquisition because language acquisition and development of the brain language system appear to reciprocally affect one another. However, this takes place only when the onset of language experience is synchronous with the onset of postnatal brain development. Age effects are not as critical in L2 acquisition as they are in L1 acquisition, because it is possible to learn a second language after puberty and communicate in it successfully, even though full mastery of the phonology, morphology, and other aspects of the language at native levels are not guaranteed. In L2 acquisition by older children and adults, brain development and L1 acquisition are more advanced when the acquisition of the L2 starts (Montrul, 2022).

Similarly, incomplete acquisition due to age effects (but not a critical period) arises in heritage language acquisition as well, when the input to the heritage language is suboptimal. Heritage speakers are exposed to their heritage language during the critical period for learning. However, in both L2 acquisition and heritage language acquisition, full mastery of all aspects of the language are not guaranteed. The timing of input, the type of input, and the amount of exposure to the L1 (heritage language) or the L2 all play a significant role in the speed, complexity, and accuracy of acquisition of the L2 or the heritage language (Montrul, 2008). We turn to this next.

1.1.5 The Role of Input in Language Acquisition

In L1 acquisition, a child who is born into a monolingual environment is exposed to the native, ambient language during much of the time when they are awake. Exposure to input happens in a naturalistic setting (the home) through spoken (or signed) interactions with caregivers and other interlocutors (see Figure 1.1). The child hears language (or sees it, in the case of signed languages) and observes the matching reality; through this exposure and interactions with other interlocutors, the child builds a grammatical representation of their native language. This is called **positive evidence**, as opposed to negative evidence. Positive evidence informs the child about the words and structures that are possible in the language, and from this input the child must extract rules and generalizations about the structure of language, inductively.

In contrast, negative evidence is information about what rules or structures are *not* part of the language, and has been argued by Chomsky to be unavailable to the child. One might imagine that such negative evidence comes from parents correcting their children's grammatical errors. However, there is in fact much evidence that parents do not engage in regular or consistent error correction. While parents do provide some recasts