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Lending String:

Location: stax

Patron:

Maxcost:

Journal Title: How languages are learned

Billing Category: Exempt

Volume: Issue:

Shipping Address:

Month/Year: 2006 Pages: 29-51

NEW: Main Library

Article Author: Lightbown & Spada

Fax:

Article Title: Explaining second language learning

Ariel:

Imprint:

Shipped: 12/8/16

ILL Number: -11328251



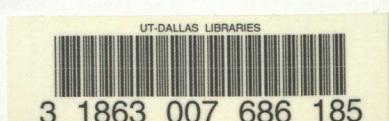
How Languages are Learned

Third edition

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First published 2006

2010 2009 2008 2007 2006

10 9 8 7 6 5 4 3 2 1

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ISBN-13: 978 0 19 422224 6

ISBN-10: 0 19 422224 1

Printed in China

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EXPLAINING SECOND LANGUAGE LEARNING

Like the explanations for first language acquisition, some second language acquisition theories give primary importance to learners' innate capacity for language acquisition. Others emphasize the role of the environment, especially opportunities to interact with speakers who adapt their language and interaction patterns to meet learners' needs. Still others focus on learners' engagement with the broader social context.

Contexts for language learning

A second language learner is different from a very young child acquiring a first language. This is true in terms of both the learner's characteristics and the environments in which first and second language acquisition typically occur. Think about how the characteristics and learning conditions of the following learners may differ: (1) a young child learning a first language; (2) a child learning a second language in day care or on the playground; (3) adolescents taking a foreign language class in their own country; (4) an adult immigrant with limited or disrupted education working in a second language environment and having no opportunity to go to language classes.

Now ask yourself the following questions about these different learners, and complete the chart in Table 2.1.

- 1 Do they already know at least one language?
- 2 Are they cognitively mature? Are they able to engage in problem solving, deduction, and complex memory tasks?
- 3 How well developed is their metalinguistic awareness? Can they define a word, say what sounds make up that word, or state a rule such as 'add an -s to form the plural'?
- 4 How extensive is their general knowledge of the world? Does this knowledge enable them to make good guesses about what a second language interlocutor is probably saying?

- 5 Are they likely to be anxious about making mistakes and concerned about sounding 'silly' when speaking the language?
- 6 Does the learning environment allow them to be silent in the early stages of learning, or are they expected to speak from the beginning?
- 7 Do they have plenty of time available for language learning, plenty of contact with proficient speakers of the language?
- 8 Do they frequently receive CORRECTIVE FEEDBACK when they make errors in grammar or pronunciation, or do listeners usually overlook these errors and pay attention to the meaning?
- 9 Do they receive corrective feedback when their meaning is not clear, when they use the wrong word, or when they say something inappropriate or impolite?
- 10 Is MODIFIED INPUT available? That is, do interlocutors adapt their speech so that learners can understand (e.g., in terms of speed of delivery, complexity of grammatical structure, or vocabulary?)

Using the chart in Table 2.1, give your opinion about the presence or absence of learner characteristics and learning conditions for four types of learners. Use the following notation:

+ = usually

- = usually absent

? = sometimes present, sometimes absent, or you're not sure

Then, compare your views with the discussion of learner characteristics and learning conditions below.

Learner characteristics

By definition, all second language learners, regardless of age, have already acquired at least one language. This prior knowledge may be an advantage in the sense that they have an idea of how languages work. On the other hand, knowledge of other languages can lead learners to make incorrect guesses about how the second language works, and this may result in errors that first language learners would not make.

Very young language learners begin the task of first language acquisition without the cognitive maturity or metalinguistic awareness that older second language learners have. Although young second language learners have begun to develop these characteristics, they will still have far to go in these areas, as well as in the area of world knowledge, before they reach the levels already attained by adults and adolescents.

On the one hand, cognitive maturity and metalinguistic awareness allow older learners to solve problems and engage in discussions about language.

	First language	Second language		
	Young child (at home)	Young child (playground)	Adolescent (classroom)	Adult (on the job)
Learner characteristics				
Another language				
Cognitive maturity				
Metalinguistic awareness				
World knowledge				
Anxiety about speaking				
Learning conditions				
Freedom to be silent				
Ample time				
Corrective feedback (grammar and pronunciation)				
Corrective feedback (meaning, word choice, politeness)				
Modified input				

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Table 2.1 *Contexts for language learning*

On the other hand, some researchers have suggested that the use of these cognitive skills—so valuable for many kinds of tasks—can actually interfere with language acquisition. Their hypothesis is that successful language acquisition draws on different mental abilities, abilities that are specific to language learning. This view is related to the idea that there is a critical period for language acquisition. It has been suggested that older learners draw on their problem solving and metalinguistic abilities precisely because they can no longer access the innate language acquisition ability they had as young children.

In addition to possible cognitive differences, there are also attitudinal and cultural differences between children and adults. Most child learners are willing to try to use the language—even when their proficiency is quite limited. Many adults and adolescents find it stressful when they are unable to express themselves clearly and correctly. Nevertheless, even very young (pre-school) children differ in their willingness to speak a language they do not know well. Some children happily chatter away in their new language; others prefer to listen and participate silently in social interaction with their peers.

Learning conditions

Younger learners, in an informal second language-learning environment, are usually allowed to be silent until they are ready to speak. They may also have opportunities to practise their second language 'voice' in songs and games that allow them to blend their voices with those of other children. Older learners are often forced to speak—to meet the requirements of a classroom or to carry out everyday tasks such as shopping, medical visits, or job interviews.

Young children in informal settings are usually exposed to the second language for many hours every day. Older learners, especially students in language classrooms, are more likely to receive only limited exposure to the second language. Classroom learners not only spend less time in contact with the language, they also tend to be exposed to a far smaller range of discourse types. For example, classroom learners are often taught language that is somewhat formal in comparison to the language as it is used in most social settings. In many foreign language classes, teachers switch to their students' first language for discipline or classroom management, thus depriving learners of opportunities to experience uses of the language in real communication.

As we saw in Chapter 1, parents tend to respond to their children's language in terms of its meaning rather than in terms of its grammatical accuracy. Similarly, in second language learning outside of classrooms, errors that do not interfere with meaning are usually overlooked. Most people would feel they were being impolite if they interrupted and corrected someone who was trying to have a conversation with them. Nevertheless, interlocutors may react to an error if they cannot understand what the speaker is trying to say. Thus, errors of grammar and pronunciation may not be remarked on, but the wrong word choice may receive comment from a puzzled interlocutor. In a situation where a second language speaker appears to use inappropriate language, interlocutors may feel uncomfortable, not knowing whether the speaker intends to be rude or simply does not know the polite way to say what is intended. In this case too, especially between adults, it is unlikely that the second language speaker would be told that something had gone wrong. The only place where feedback on error is typically present with high frequency is the language classroom. Even there, it is not always provided consistently.

One condition that appears to be common to learners of all ages—though perhaps not in equal quality or quantity—is exposure to modified or adapted input. This adjusted speech style, called child-directed speech in first language acquisition, has sometimes been called FOREIGNER TALK or TEACHER TALK in certain contexts of second language acquisition. Some people who interact regularly with language learners seem to have an

intuitive sense of what adjustments they need to make to help learners understand. Of course, some people are much better at this than others. We have all witnessed those painful conversations in which people seem to think that they can make learners understand better if they simply talk louder! Some Canadian friends told us of an experience they had in China. They were visiting some historic temples and wanted to get more information about them than they could glean from their guidebook. They asked their guide some questions about the monuments. Unfortunately, their limited Chinese and his non-existent English made it difficult for them to exchange information. The guide kept speaking louder and louder, but our friends understood very little. Finally, in frustration, the guide concluded that it would help if they could see the information—so he took a stick and began writing in the sand—in Chinese characters!



A general theory of second language acquisition needs to account for language acquisition by learners with a variety of characteristics in a variety of contexts. The emphasis in this chapter is on theories that have been proposed to explain the aspects of language acquisition that are common to all second language learners and contexts. We will look at how behaviourist and innatist explanations have been extended to account for second language acquisition. We will also look at some theories from cognitive psychology that have increasingly informed second language research in recent years. These COGNITIVIST theories emphasize the way the mind perceives,

retains, organizes, and retrieves information. Finally, we will look at SOCIOCULTURAL THEORY, a perspective that places second language acquisition in a larger social context.

Behaviourism

As we saw in Chapter 1, behaviourist theory explained learning in terms of imitation, practice, reinforcement (or feedback on success), and habit formation. Much of the early research within behaviourist theory was done with laboratory animals, but the learning process was hypothesized to be the same for humans.

Second language applications: Mimicry and memorization

Behaviourism had a powerful influence on second and foreign language teaching, especially in North America, between the 1940s and the 1970s. Nelson Brooks (1960) and Robert Lado (1964) were two proponents of this perspective whose influence was felt directly in the development of AUDIOLINGUAL teaching materials and in teacher training. Classroom activities emphasized mimicry and memorization, and students learned dialogues and sentence patterns by heart. Because language development was viewed as the formation of habits, it was assumed that a person learning a second language would start off with the habits formed in the first language and that these habits would interfere with the new ones needed for the second language. Thus, behaviourism was often linked to the CONTRASTIVE ANALYSIS HYPOTHESIS (CAH), which was developed by structural linguists in Europe and North America. According to the CAH, where the first language and the target language are similar, learners should acquire TARGET LANGUAGE structures with ease; where there are differences, learners should have difficulty. However, researchers have found that learners do not make all the errors predicted by the CAH. Instead, many of their actual errors are not predictable on the basis of their first language. Adult second language learners produce sentences that sound more like a child's. Also, many of their sentences would be ungrammatical if translated into their first language. What is more, some characteristics of the simple structures they use are very similar across learners from a variety of backgrounds, even if their respective first languages are different from each other and different from the target language.

In Chapter 4, we will see ample evidence that second language learners draw on what they already know. However, we will also see that they are sometimes reluctant to transfer certain first language patterns, even when the

translation equivalent would be correct. Also, first language influence may become more apparent as more is learned about the second language, leading learners to see similarities that they had not perceived at an earlier stage. All this suggests that the influence of the learner's first language may not simply be a matter of the **TRANSFER** of habits, but a more subtle and complex process of identifying points of similarity, weighing the evidence in support of some particular feature, and even reflecting (though not necessarily consciously) about whether a certain feature seems to 'belong' in the target language. By the 1970s, many researchers were convinced that behaviourism and the contrastive analysis hypothesis were inadequate explanations for second language acquisition. Some of these criticisms arose as a result of the growing influence of innatist views of language acquisition.

The innatist perspective: Universal Grammar

As we saw in Chapter 1, the rejection of behaviourism as an explanation for first language acquisition was partly triggered by Chomsky's critique of it. Chomsky argued that innate knowledge of the principles of Universal Grammar (UG) permits all children to acquire the language of their environment during a critical period of their development. While Chomsky did not make specific claims about the implications of his theory for second language learning, Lydia White (2003a) and other linguists have argued that Universal Grammar offers the best perspective from which to understand second language acquisition. Others, for example Robert Bley Vroman (1983) and Jacquelyn Schachter (1990) argue that, although UG is a good framework for understanding first language acquisition, it is not a good explanation for the acquisition of a second language, especially by learners who have passed the critical period. In their view, this means that second language acquisition has to be explained by some other theory, perhaps one of the more general psychological theories described below.

Vivian Cook (2003) and others point out that, even though many learners fail to achieve complete mastery of the target language, there is still a 'logical problem' of second language acquisition. That is, we need to find an explanation for the evidence that learners eventually know more about the language than they could reasonably have learned if they had to depend entirely on the input they are exposed to. This suggests that knowledge of UG must be available to second language learners as well as to first language learners. Some of the theorists who hold this view claim that the nature and availability of UG are the same in first and second language acquisition. Others argue that UG may be present and available to second language learners, but that its exact nature has been altered by the acquisition of other languages.

Researchers working within the UG framework also differ in their hypotheses about how formal instruction or the availability of feedback on their learning will affect learners' knowledge of the second language. Bonnie Schwartz (1993), for example, concludes that such instruction and feedback change only the superficial appearance of language performance and do not really affect the underlying systematic knowledge of the new language. Rather, language acquisition is based on the availability of natural language in the learner's environment. Lydia White (1991) and others who think that the nature of UG is altered by the acquisition of the first language suggest that second language learners may sometimes need explicit information about what is not grammatical in the second language. Otherwise, they may assume that some structures of the first language have equivalents in the second language when, in fact, they do not. We will see some examples of language structures that are influenced by the learner's first language in Chapter 4 and some studies related to the effect of instruction and feedback in Chapter 6.

Researchers who study second language acquisition from a UG perspective are usually interested in the language competence of advanced learners—their complex knowledge of grammar—rather than in the simple language of beginning learners. They are interested in whether the competence that underlies the PERFORMANCE or use of the second language resembles the competence underlying the language performance of native speakers. Thus, their investigations often involve GRAMMATICALITY JUDGEMENTS or other methods to probe what learners know about the language rather than observations of speaking. By using such methods, they hope to gain insight into what learners actually know about the language rather than how they happen to use it in a given situation.

Second language applications: Krashen's 'monitor model'

One model of second language acquisition that was influenced by Chomsky's theory of first language acquisition was Stephen Krashen's (1982) Monitor Model. He first described this model in the early 1970s, at a time when there was growing dissatisfaction with language teaching methods based on behaviourism. Krashen described his model in terms of five hypotheses.

First, in the *acquisition–learning hypothesis*, Krashen contrasts these two terms. We 'acquire' as we are exposed to samples of the second language we understand in much the same way that children pick up their first language—with no conscious attention to language form. We 'learn' on the other hand through conscious attention to form and rule learning.

Next, according to the *monitor hypothesis*, the acquired system initiates a speaker's utterances and is responsible for spontaneous language use. The learned system acts as an editor or 'monitor', making minor changes and polishing what the acquired system has produced. Such monitoring takes place only when the speaker/writer has plenty of time, is concerned about producing correct language, and has learned the relevant rules.

The *natural order hypothesis* was based on the finding that, as in first language acquisition, second language acquisition unfolds in predictable sequences. The language features that are easiest to state (and thus to learn) are not necessarily the first to be acquired. For example, the rule for adding an -s to third person singular verbs in the present tense is easy to state, but even some advanced second language speakers fail to apply it in spontaneous conversation (see Chapter 4).

The *input hypothesis* is that acquisition occurs when one is exposed to language that is comprehensible and that contains $i + 1$. The 'i' represents the level of language already acquired, and the '+1' is a metaphor for language (words, grammatical forms, aspects of pronunciation) that is just a step beyond that level.

The fact that some people who are exposed to large quantities of comprehensible input do not necessarily acquire a language successfully is accounted for by Krashen's *affective filter hypothesis*. The 'affective filter' is a metaphorical barrier that prevents learners from acquiring language even when appropriate input is available. 'Affect' refers to feelings, motives, needs, attitudes, and emotional states. A learner who is tense, anxious, or bored may 'filter out' input, making it unavailable for acquisition.



Both psychologists and linguists challenged Krashen's model. Linguist Lydia White (1987) questioned one of his hypotheses in a paper called 'Against Comprehensible Input'. Psychologist Barry McLaughlin's 1978 article was one of the first to raise the question of whether the five hypotheses could be tested by empirical research. For example, distinguishing between 'acquired' and 'learned' knowledge can lead to circular definitions (if it's acquired, it's fluent; if it's fluent, it's acquired) and to a reliance on intuition rather than observable differences in behaviour.

In spite of lively criticism and debate, Krashen's ideas were very influential during a period when second language teaching was in transition from approaches that emphasized learning rules or memorizing dialogues to approaches that emphasized using language with a focus on meaning. Since then, COMMUNICATIVE LANGUAGE TEACHING, including IMMERSION and CONTENT-BASED INSTRUCTION, has been widely implemented, and Krashen's ideas have been a source of ideas for research in second language acquisition. Classroom research has confirmed that students can make a great deal of progress through exposure to comprehensible input without direct instruction. Studies have also shown, however, that students may reach a point from which they fail to make further progress on some features of the second language unless they also have access to guided instruction (see Chapter 6). Some insights from learning theories developed in psychology help to explain why this may be so.

Current psychological theories: The cognitivist/developmental perspective

Since the 1990s, psychological theories have become increasingly central to research in second language development. Some of these theories use the computer as a metaphor for the mind, comparing language acquisition to the capacities of computers for storing, integrating, and retrieving information. Some draw on neurobiology, seeking to relate observed behaviour as directly as possible to brain activity.

As in first language acquisition, cognitive and developmental psychologists argue that there is no need to hypothesize that humans have a language-specific module in the brain or that 'acquisition' and 'learning' are distinct mental processes. In their view, general theories of learning can account for the gradual development of complex syntax and for learners' inability to spontaneously use everything they know about a language at a given time. As noted above, some linguists have also concluded that, while UG provides a plausible explanation for first language acquisition, something else is required for second language acquisition since it so often falls short of full success.

Information processing

Cognitive psychologists working in an information-processing model of human learning and performance see second language acquisition as the building up of knowledge that can eventually be called on automatically for speaking and understanding. Norman Segalowitz (2003) and others have suggested that learners have to pay attention at first to any aspect of the language that they are trying to understand or produce. 'Pay attention' in this context is accepted to mean using cognitive resources to process information. However, there is a limit to how much information a learner can pay attention to. Thus, learners at the earliest stages will use most of their resources to understand the main words in a message. In that situation, they may not notice the grammatical morphemes attached to some of the words, especially those that do not substantially affect meaning. Gradually, through experience and practice, information that was new becomes easier to process, and learners become able to access it quickly and even automatically. This frees them to pay attention to other aspects of the language that, in turn, gradually become automatic.

For proficient speakers, choosing words, pronouncing them, and stringing them together with the appropriate grammatical markers is essentially automatic. When proficient listeners hear a familiar word, even for a split second, they cannot help but understand it. Such automatic responses do not use up the kind of resources needed for processing new information. Thus, proficient language users can give their full attention to the overall meaning of a text or conversation, whereas learners use more of their attention on processing the meaning of individual words. This helps to explain why second language readers need more time to understand a text, even if they eventually do fully comprehend it (Favreau and Segalowitz 1983). The information processing model suggests that there is a limit to the amount of focused mental activity we can engage in at one time.

Note that the 'practice' needed for the development of automaticity is not something mechanical, and it is not limited to the production of language. Exposure to, and comprehension of, a language feature may also be counted as practice. In information processing, practice involves cognitive effort on the part of the learner, but it need not necessarily be available for the learner's introspection. It can occur below the level of awareness.

Similar 'information processing' approaches to second language acquisition have been explored by other researchers. Drawing on J. R. Anderson's (1995) work, Robert DeKeyser (1998, 2001) and others have investigated second language acquisition as 'skill learning'. They suggest that most learning, including language learning, starts with DECLARATIVE KNOWLEDGE, also referred to as knowledge *that*. The hypothesis is that, through practice, declarative knowledge may become PROCEDURAL KNOWLEDGE,

or knowledge *how*, in the same way that someone learns other skills like driving a car or skating. Indeed, once skills become proceduralized and automatized, thinking about the declarative knowledge while trying to perform the skill actually disrupts the smooth performance of it. In second language acquisition, the path from declarative to procedural knowledge is sometimes associated with the kind of learning that takes place in a classroom, where rule learning is followed by practice. With enough practice, procedural knowledge eclipses the declarative knowledge, which, in time, may be forgotten. For this reason, fluent speakers may not even realize that they once possessed the declarative knowledge that set the process in motion.

Sometimes changes in language behaviour do not seem to be explainable in terms of a gradual build-up of fluency through practice. These changes have been described in terms of 'restructuring' (Lightbown 1985; McLaughlin 1990). They seem to be based on some qualitative change in the learner's knowledge. Restructuring may account for what appear to be sudden bursts of progress, when learners suddenly seem to 'put it all together', even though they have not had any new instruction or apparently relevant exposure to the language. It may also explain apparent backsliding, when a systematic aspect of a learner's language incorporates too much or incorporates the wrong things. For example, when a learner finally masters the use of the regular *-ed* ending to show past tense, irregular verbs that had previously been 'practised' correctly may be affected. Thus, after months of saying 'I saw a film', the learner may say 'I seed' or even 'I sawed'. Such errors are not based on practice of those specific items but rather on their integration into a general pattern.

Another concept from psychology offers insight into how learners store and retrieve language. According to 'transfer appropriate processing', information is best retrieved in situations that are similar to those in which it was acquired (Blaxton 1989). This is because when we learn something our memories also record something about the context in which it was learned and even about the way we learned it, for example, by reading or hearing it. To date, most of the research on transfer appropriate processing has been done in laboratory experiments, for example, comparing the learning of word lists under different conditions. However, the hypothesis seems to offer a plausible way of explaining a widely observed phenomenon in second language learning: knowledge that is acquired mainly in rule learning or drill activities may be easier to access on tests that resemble the learning activities than in communicative situations (Gatbonton and Segalowitz 1988, 2005). On the other hand, if, during learning, the learner's cognitive resources are completely occupied with a focus on meaning in communicative activities, retrieval of specific language features such as grammatical markers or word order on a test of those features may be more difficult.

Connectionism

As seen in the discussion of first language acquisition in Chapter 1, connectionists, unlike innatists, see no need to hypothesize the existence of a neurological module dedicated exclusively to language acquisition. Like most cognitive psychologists, connectionists attribute greater importance to the role of the environment than to any specific innate knowledge in the learner, arguing that what is innate is simply the ability to learn, not any specifically linguistic principles. Connectionists also attribute less importance to the kind of declarative knowledge that characterizes some theories of skill learning. As Nick Ellis (2002) explains, the emphasis is on the frequency with which learners encounter specific linguistic features in the input and the frequency with which features occur together.

Connectionists argue that learners gradually build up their knowledge of language through exposure to the thousands of instances of the linguistic features they eventually hear. After hearing language features in specific situational or linguistic contexts over and over again, learners develop a stronger and stronger network of 'connections' between these elements. Eventually, the presence of one situational or linguistic element will activate the other(s) in the learner's mind. For example, learners might get subject–verb agreement correct, not because they know a rule but because they have heard examples such as 'I say' and 'he says' so often that each subject pronoun activates the correct verb form. Connections like these may be very strong because the elements have occurred together very frequently or they may be relatively weaker because there have been fewer opportunities to experience them together. Evidence for the connectionist view comes from the observation that much of the language we use in ordinary conversation is predictable, in some cases to the point of being formulaic. As suggested by Nick Ellis (2003, 2005) and others, language is at least partly learned in chunks larger than single words and not all sentences or phrases are put together one word at a time.

As noted in Chapter 1, connectionist research has shown that a learning mechanism, simulated by a computer program, cannot only 'learn' what it hears but can also generalize, even making overgeneralization errors. These studies have so far dealt almost exclusively with the acquisition of vocabulary and grammatical morphemes, that is, aspects of the language that even innatists will grant may be acquired largely through memorization and simple generalization. How this model of cumulative learning can lead to knowledge of complex syntactic structures is an important area for continued research.

The competition model

The competition model is closely related to the connectionist perspective. It is also based on the hypothesis that language acquisition occurs without the necessity of a learner's focused attention or the need for any innate brain module that is specifically for language. Elizabeth Bates and Brian MacWhinney (1981) described the competition model as an explanation for language acquisition that takes into account not only language form but also language meaning and language use. The competition model is proposed as an explanation for both first and second language acquisition. Through exposure to thousands of examples of language associated with particular meanings, learners come to understand how to use the 'cues' with which a language signals specific functions. For example, the relationship between words in a sentence may be signalled by word order, grammatical markers, and the animacy of the nouns in the sentence. Most languages make use of multiple cues, but they differ in the primacy of each. This becomes clear in a situation where the meaning of a sentence is not immediately obvious. What helps you figure out the meaning? English uses word order as the most common indicator of the relationships between sentence components. Most English sentences have the order Subject-Verb-Object (SVO). That is, the typical English sentence mentions the subject first, then the verb, then the object. Two- and three-year old English speaking children use cues of animacy and their knowledge of the way things work in the world to interpret odd sentences. Thus, if they hear a string of words such as 'Box push boy', they will act it out by making a boy doll push a tiny box, focusing on the fact that the 'boy' is the natural agent of action in this situation. However, the SVO pattern is so strong in English that, before they are four years old, children will give an SVO interpretation to such strings of words. They will ignore the fact that boxes don't normally move on their own, and carefully demonstrate how the box pushes the boy. Word order patterns are stronger than animacy cues at this point. Furthermore, at this age, they may attribute the SVO relationship to sentences in the passive voice. That is, 'The box was pushed by the boy' may be interpreted as 'The box pushed the boy.' Only later do they learn to pay attention to the grammatical markers that distinguish the active voice sentence from the passive word order.

Other languages, for example, Spanish and Italian, have more flexible word order. As Brian MacWhinney (1997) explains, speakers of these languages, even as adults, rely more on grammatical markers (for example, the agreement of subject and verb, the case marking of pronouns) or on the animacy of nouns to understand how sentence elements are related. When English speakers are learning these languages, they may have difficulty suppressing their tendency to rely on word order as the basis for interpretation. For example, an English speaking learner of Italian may find

it confusing to hear sentences such as '*Il giocattolo guarda il bambino*' (the toy—is looking at—the boy). An Italian speaker, accustomed to more flexible word order, focuses on the animacy of the two nouns and concludes that the most reasonable interpretation is that the boy is looking at the toy. According to the competition model, second language acquisition requires that learners learn the relative importance of the different cues appropriate in the language they are learning (MacWhinney 1997).

Second language applications: Interacting, noticing, and processing

A number of hypotheses, theories, and models for explaining second language acquisition have been inspired by the cognitivist/developmental perspective.

The interaction hypothesis

Evelyn Hatch (1978), Michael Long (1983, 1996), Teresa Pica (1994) and Susan Gass (1997), among others, argue that conversational interaction is an essential, if not sufficient, condition for second language acquisition. These researchers have studied the ways in which speakers modify their speech and their interaction patterns in order to help learners participate in a conversation or understand some information. Long (1983) agreed with Krashen that comprehensible input is necessary for language acquisition. However, he focused more on the question of how input could be made comprehensible. He argued that MODIFIED INTERACTION is the necessary mechanism for making language comprehensible. That is, what learners need is not necessarily simplification of the linguistic forms but rather an opportunity to interact with other speakers, working together to reach mutual comprehension. Through these interactions, interlocutors figure out what they need to do to keep the conversation going and make the input comprehensible. According to Long, there are no cases of beginner-level learners acquiring a second language from native-speaker talk that has not been modified in some way.

In the original (1983) formulation of the Interaction Hypothesis, Long inferred that modified interaction is necessary for language acquisition, summarizing the relationship as follows:

- 1 Interactional modification makes input comprehensible.
 - 2 Comprehensible input promotes acquisition.
- Therefore,
- 3 Interactional modification promotes acquisition.

Modified interaction does not always involve linguistic simplification. It may also include elaboration, slower speech rate, gesture, or the provision of additional contextual cues. Some examples of these conversational modifications are:

- 1 Comprehension checks—efforts by the native speaker to ensure that the learner has understood (for example, ‘The bus leaves at 6:30. Do you understand?’).
- 2 Clarification requests—efforts by the learner to get the native speaker to clarify something that has not been understood (for example, ‘Could you repeat please?’). These requests from the learner lead to further modifications by the native speaker.
- 3 Self-repetition or paraphrase—the native speaker repeats his or her sentence either partially or in its entirety (for example, ‘She got lost on her way home from school. She was walking home from school. She got lost.’).

Research has shown that conversational adjustments can aid comprehension. Modification that takes place during interaction leads to better understanding than linguistic simplification or modification that is planned in advance. While some recent research has shown that specific kinds of interaction behaviours aid learning in terms of immediate production, more research is needed on how access to modified interaction affects second language acquisition in the long term.

In Long’s (1996) revised version of the Interaction Hypothesis, more emphasis is placed on the importance of corrective feedback during interaction. When communication is difficult, interlocutors must ‘negotiate for meaning’, and this negotiation is seen as the opportunity for language development. Merrill Swain (1985) extended this thinking when she proposed ‘the comprehensible output hypothesis’. She observed that it is when learners must produce language that their interlocutor can understand that they are most likely to see the limits of their second language ability and the need to find better ways to express their meaning. The demands of producing comprehensible output, she hypothesized, ‘push’ learners ahead in their development.

The noticing hypothesis

Richard Schmidt (1990, 2001) proposed the ‘noticing hypothesis’, suggesting that nothing is learned unless it has been noticed. Noticing does not itself result in acquisition, but it is the essential starting point.

Schmidt’s original proposal of the noticing hypothesis came from his own experience as a learner of Portuguese. After months of taking classes, living in

Brazil, and keeping a diary, he began to realize that certain features of language that had been present in the environment for the whole time began to enter his own second language system only when he had noticed them, either because they were brought to his attention in class or because some other experience made them salient. Drawing on psychological learning theories, Schmidt hypothesized that second language learners could not begin to acquire a language feature until they had become aware of it in the input. Susan Gass (1988) also described a learning process that begins when learners notice something they hear or see in the second language that is different from what they expected or that fills a gap in their knowledge of the language. The question of whether learners must be aware that they are 'noticing' something in the input is the object of considerable debate. According to information processing theories, anything that uses up our mental 'processing space', even if we are not aware of it or attending to it 'on purpose', can contribute to learning. From the connectionist perspective, the likelihood of acquisition is best predicted by the frequency with which something is available for processing, not by the learner's awareness of something in the input.

These questions about the importance of awareness and attention have been the object of debate and research. Several researchers have found ways to track learners' attention as they engage in second language interaction or activity. Alison Mackey, Susan Gass, and Kim McDonough (2000) have described techniques, for example, having learners see and hear themselves in videotaped interactions, to explore what they were thinking as they participated in conversations. Ron Leow (1997) developed crossword puzzles that learners had to solve while speaking aloud. Merrill Swain and Sharon Lapkin (1998) recorded learners in pair work and kept track of the language features they mentioned. These research designs cannot tell us if learners noticed things they did not mention. However, they do make it possible to identify some things that learners showed they were aware of and to compare these to performance on measures of their language knowledge. The extent to which learners' awareness of language features affects their second language development will come up again in our discussion of research on second language acquisition in the classroom in Chapter 6.

Input processing

In his research with American university students learning foreign languages, Bill VanPatten (2004) observed many cases of students misinterpreting sentences. For example, as predicted by the competition model, when these English speakers heard sentences such as '*La sigue el señor*', they interpreted it as 'She (subject pronoun) follows the man'. The correct interpretation is 'Her (object pronoun) follows the man' (subject of the sentence). In other words, the correct English translation would be 'The

man follows her'. In order to understand that, students need to learn that in Spanish, a pronoun object precedes the verb and that it is essential to pay attention to whether the pronoun is a subject or an object rather than to the word order alone. (See the discussion of the competition model earlier in this chapter.)

VanPatten argued that the problem arose in part from the fact that learners have limited processing capacity and cannot pay attention to form and meaning at the same time. Not surprisingly, they tend to give priority to meaning. When the context in which they hear a sentence helps them make sense of it, they do not notice details of the language form. In Chapter 6 we will see how VanPatten developed instructional procedures that require learners to focus on the language itself in order to interpret the meaning.

Processability theory

Jürgen Meisel, Harald Clahsen, and Manfred Pienemann (1981) studied the acquisition of German by a group of adult migrant workers who had little or no second language instruction. They analysed large samples of their speech and described the details of developmental sequences in their production of simple and complex sentences. They concluded that the sequence of development for features of syntax and morphology was affected by how easy these were to process. Ease of processing was found to depend to a large extent on the position of those features in a sentence. Features that typically occurred at the beginning or end of a sentence were easier to process than those that were in the middle. All learners acquired the features in the same sequence, even though they progressed at different rates. They also found that some language features did not seem to be affected by these constraints and were used by learners who were at different developmental stages. These were referred to as 'variational' features.

Pienemann (1999, 2003) developed his processability theory on the basis of his continued research with learners of different languages in a variety of settings, both instructional and informal. One important aspect of his theory is the integration of developmental sequences with first language influence. He argues that his theory explains a widely reported phenomenon in second language acquisition: learners do not simply transfer features from their first language at early stages of acquisition. Instead, they have to develop a certain level of processing capacity in the second language before they can use their knowledge of the features that already exist in their first language. We will see many examples of this in Chapter 4.

The sociocultural perspective

As we saw in Chapter 1, Vygotsky's theory assumes that cognitive development, including language development, arises as a result of social interactions. Primary among these interactions are those between individuals. Unlike the psychological theories that view thinking and speaking as related but independent processes, sociocultural theory views speaking and thinking as tightly interwoven. Speaking (and writing) mediate thinking, which means that people can gain control over their mental processes as a consequence of internalizing what others say to them and what they say to others. Learning is thought to occur when an individual interacts with an interlocutor within his or her zone of proximal development (ZPD)—that is, in a situation in which the learner is capable of performing at a higher level because there is support from an interlocutor.

In some ways, this approach may appear to restate some of the hypotheses encountered elsewhere in this chapter. People sometimes wonder whether the ZPD is the same as Krashen's $i+1$. William Dunn and James Lantolf (1998) addressed this question in a review article, arguing that it is not possible to compare the two concepts because they depend on very different ideas about how development occurs. The ZPD is a metaphorical location or 'site' in which learners co-construct knowledge in collaboration with an interlocutor. In Krashen's $i+1$ the input comes from outside the learner and the emphasis is on the comprehensibility of input that includes language structures that are just beyond the learner's current developmental level. The emphasis in ZPD is on development and how learners co-construct knowledge based on their interaction with their interlocutor or in PRIVATE SPEECH.

Vygotskyan theory has also been compared to the interaction hypothesis because of the interlocutor's role in helping learners understand and be understood. These two perspectives differ primarily in the emphasis they place on the internal cognitive processes. In the interaction hypothesis, the emphasis is on the individual cognitive processes in the mind of the learner. Interaction facilitates those cognitive processes by giving learners access to the input they need to activate internal processes. In Vygotskyan theory, greater importance is attached to the conversations themselves, with learning occurring through the social interaction. Sociocultural theory holds that people gain control of and reorganize their cognitive processes during mediation as knowledge is internalized during social activity.

Second language applications: Learning by talking

Extending Vygotskyan theory to second language acquisition, Jim Lantolf (2000), Richard Donato (1994) and others are interested in showing how second language learners acquire language when they collaborate and

interact with other speakers. Traditionally, the ZPD has been understood to involve an expert and a novice, however, recent work has broadened the term to include novice/novice or learner/learner interlocutors. An example of this is in Communication task B in Chapter 5. In that excerpt the learners are struggling with French reflexive verbs as they try to construct a storyline from pictures. That example is taken from the work of Merrill Swain and Sharon Lapkin (2002), who have investigated sociocultural explanations for second language learning in Canadian French immersion programmes. Their work has its origins in Swain's 'comprehensible output hypothesis' and the notion that the production of language pushes learners to process language more deeply. In preparing to speak or write, they must pay more attention to how meaning is expressed through language than they do for the comprehension of language. Swain (1985) first proposed the 'COMPREHENSIBLE OUTPUT HYPOTHESIS' in response to Krashen's comprehensible input hypothesis, based on the observation that French immersion students were considerably weaker in their speaking and written production than in their reading and listening comprehension (see Chapter 6). She advocated more opportunities for learners to engage in verbal production (i.e. 'output') in French immersion classrooms. Since then, she and her colleagues have carried out extensive research to investigate the effects of output on second language learning.

Swain's (2000) early work on the output hypothesis was influenced by cognitive theory, but more recent work has been motivated by sociocultural theory. Using the term 'collaborative dialogue', Swain and Lapkin and their colleagues have carried out a series of studies to determine how second language learners co-construct linguistic knowledge while engaging in production tasks (i.e. speaking and writing) that simultaneously draw their attention to form and meaning. In Communication task B in Chapter 5, learners were testing hypotheses about the correct forms to use, discussing them together and deciding what forms were best to express their meaning. Swain (2000) considers collaborative dialogues such as these as the context where 'language use and language learning can co-occur. It is language use mediating language learning. It is cognitive activity and it is social activity' (p. 97).

Therefore, the difference between the sociocultural perspective and that of other researchers who also view interaction as important in second language acquisition is that sociocultural theorists assume that the cognitive processes begin as an external socially mediated activity and eventually become internalized. Other interactionist models assume that modified input and interaction provide learners with the raw material for internal cognitive processes.

Theory into practice

In the end, what all theories of language acquisition are intended to account for is the ability of human learners to acquire language within a variety of social and instructional environments. All of the theories discussed in this chapter and in Chapter 1 use metaphors to represent this invisible reality. Both linguists and psychologists draw some of their evidence from neurological research. At present, most of the research on specific brain activity during language processing must be based on indirect evidence. Advances in technology are rapidly increasing opportunities to observe brain activity more directly. Such research will eventually contribute to reinterpretations of research that, until now, can examine only observable behaviour.

Many claims from behaviourist theory were based on experiments with animals learning a variety of responses to laboratory stimuli. Their applicability to the natural learning of languages by humans was strongly challenged by psychologists and linguists alike, primarily because of the inadequacy of behaviourist models to account for the complexity involved in language learning.

Newer psychological theories have often involved computer simulations or controlled laboratory experiments where people learn specific sets of carefully chosen linguistic features, often in an invented language. Many linguists argue that this does not entitle psychologists to generalize to the complexities of the linguistic knowledge that learners eventually have.

Linguists working from an innatist perspective draw much of their evidence from studies of the complexities of proficient speakers' language knowledge and performance and from analysis of their own intuitions about language. Critics of this view argue that it is not enough to know what the final state of knowledge is and that more attention should be paid to the developmental steps leading up to this level of mastery.

Interactionists emphasize the role of modification in conversational interactions. This perspective, as well as the sociocultural perspective, provides insights into the ways in which learners can gain access to new knowledge about the language when they have support from an interlocutor. Some critics of the interactionist position argue that much of what learners need to know is not available in the input, and so they put greater emphasis on innate principles of language that learners can draw on.

Researchers and educators who are hoping for language acquisition theories that give them insight into language teaching practice are often frustrated by the lack of agreement among the 'experts'. The complexities of second language acquisition, like those of first language acquisition, represent

puzzles that scientists will continue to work on for a long time. Research that has theory development as its goal has important long-term significance for language teaching and learning, but agreement on a 'complete' theory of language acquisition is probably, at best, a long way off. Even if such agreement were reached, there would still be questions about how the theory should be interpreted for language teaching practice. Many teachers watch theory development with interest, but must continue to teach and plan lessons and assess students' performance in the absence of a comprehensive theory of second language learning.

A growing body of applied research draws on a wide range of theoretical orientations, sometimes explicitly stated, sometimes merely implied. This research may provide information that is more helpful in guiding teachers' reflections about pedagogy. In Chapters 5 and 6, we will examine language acquisition research that has focused on learning in the classroom. First, however, we will review research on individual differences that influence learners' success in language acquisition (Chapter 3) and some detailed descriptions of learners' developing language knowledge and use (Chapter 4).

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Second language learners: who succeeds?

Many of us believe that individual differences may be important factors that can predict success or failure in language learning. Such beliefs may be based on our own experience or that of people we have known. In fact, many teachers are convinced that extroverted learners who have low levels of inhibition in the second language and seek opportunities to practice language skills will be the most successful learners. In addition to an outgoing personality, other characteristics often believed to predict success in language learning are intelligence, aptitude, motivation, and the age at which learning begins.

In this chapter, we will see whether these assumptions are supported by research findings. To what extent can we predict individual differences in the success of second language acquisition if we have information about learners' personalities, their general and specific intellectual abilities, their motivation, or their age?