

9 Input and Interaction

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Over the past few decades there have been many ways that scholars have approached the study of second language acquisition. This book, and hence this chapter on input and interaction, takes a cognitive science perspective on second language acquisition. The input and interaction approach takes as its starting point the assumption that language learning is stimulated by communicative pressure, and examines the relationship between communication and acquisition and the mechanisms (e.g., noticing, attention) that mediate between them. We begin with a discussion of the evidence requirements for learning. We then take an historical look at the study of input/interaction, and from there move to a review of recent research, followed by a consideration of how learning is fostered through interaction.

1 Language Learning Requirements: Input and Output

If we are to understand the role of input and output in second language learning, we need to know: (i) What kind of language is available to learners? (ii) What are the theoretical consequences of having such language information available? (iii) What is the significance of language use (output)? In other words, what do learners need in order to construct second language grammars? These issues are considered in the next sections. In particular, the focus is on the types of information that learners must have in order to construct L2 grammatical knowledge (sections 1.1 and 1.2) and what they need to do with the information in language use situations.

1.1 *Nature vs. nurture*

Two positions on how learning takes place have appeared in the literature: they are commonly referred to as nature and nurture.¹ The first refers to the possibility

that learners (whether child first language learners or adult second language learners) come to the learning situation with innate knowledge about language; the second position claims that language development is inspired and conditioned by the environment, that is, the interactions in which learners engage.

The major question being addressed is: how can learners attain certain kinds of knowledge without being explicitly taught it or without being exposed to it in some direct way? The nature position is an innatist one that claims that learners (at least children) are born with a structure (Universal Grammar [UG]) that allows them to learn language. UG "is taken to be a characterization of the child's prelinguistic state" (Chomsky, 1981, p. 7).

With regard to input, the question to be asked is: how can children learn a complex set of abstractions when the input alone does not contain evidence of these abstractions? If the input does not provide the information necessary for the extraction of abstractions, there must be something in addition to the input that children use in grammar formation. UG is hypothesized to be an innate language faculty that limits the kinds of languages that can be created. While there is still considerable disagreement as to the nature of UG, there is widespread agreement among linguists that there is some sort of innately specified knowledge that children are born with; the position for L2 acquisition is much less clear (cf. Bley-Vroman, 1989, 1990; Clahsen, 1990; Clahsen and Muysken, 1986; O'Grady, 1996; Schachter, 1988, 1991; Wolfe-Quintero, 1996). The underlying theoretical need to posit an innate language faculty comes from the fact that there is no way to "retreat" from an overgeneralized grammar.² In sum, within this framework, the input provides language-specific information which interacts with whatever innate structure an individual (child or adult) brings to the language learning situation.

1.2 Evidence types

Traditionally, there are three types of evidence discussed in the literature on language learning (both first and second): positive evidence, negative evidence, and indirect negative evidence.³ We will deal only with the first two.⁴

1.2.1 Positive evidence

Broadly speaking, positive evidence refers to the input and basically comprises the set of well-formed⁵ sentences to which learners are exposed. In some SLA literature (particularly that dealing with instruction), positive evidence is referred to as models. These utterances are available from the spoken language (or visual language in the case of sign language) and/or from the written language. This is the most direct means that learners have available to them from which they can form linguistic hypotheses.

1.2.2 Negative evidence

Negative evidence refers to the type of information that is provided to learners concerning the incorrectness of an utterance. This might be in the form of

explicit or implicit information. The following are examples of explicit and implicit negative evidence respectively:

- (1) I seed the man.
No, we say "I saw the man"

- (2) From Mackey, Gass, and McDonough (2000):
NNS: There's a basen of flowers on the bookshelf
NS: a basin?
NNS: base
NS: a base?
NNS: a base
NS: oh, a vase
NNS: vase

In the first example, the learner is receiving direct information about the ungrammaticality of what was said, whereas in the second example, ungrammaticality must be inferred. In the second example, it is, of course, possible that the learner will not understand that this is intended as a correction and may only think that the speaker really did not hear what was said, although as the interaction progresses, it becomes less and less likely that the "lack of understanding" explanation is an appropriate one.

As a summary of the two evidence types discussed thus far, Long (forthcoming) provides a useful taxonomy. Evidence can be positive or negative. If positive, it can be either authentic or modified. If modified, it can be simplified or elaborated. Negative evidence can also be of two types: pre-emptive (occurring before an actual error – as in a classroom context) or reactive. If reactive, it can be explicit or implicit. Explicit evidence is an overt correction. Implicit evidence can result in a communication breakdown or in a recast. Recasts, in turn, can be simple (a repetition) or elaborated (a change to a [generally grammatical] form).

1.2.3 *The significance of evidence types*

The distinction among types of evidence has theoretical ramifications for language acquisition. Positive evidence is the most obviously necessary requirement for learning. One must have exposure to the set of grammatical sentences in order for learning to take place. However, the role of negative evidence is less clear. In fact, for first language acquisition, the argument is that there is a need to posit an innate structure that allows acquisition to take place precisely because negative evidence is not available or, at least, is not consistently available. Therefore, without an innate structure, there would be no way to eliminate certain errors given the lack of availability of full information through positive evidence (see White, 1989, for a fuller discussion). For second language acquisition similar arguments have been made. In addition, Schwartz (1993) argues that only positive evidence contributes to the formation and

restructuring of second language grammars. She does acknowledge a role for negative evidence although she questions the extent to which negative evidence can engage UG.

1.3 Output

A third component that has been argued to be required for successful second language learning is output. Swain (1985, 1995) and Swain and Lapkin (1995, 1998) discuss what Swain originally referred to as comprehensible output. Her argument for the need for output was based initially on observations of immersion programs in Canada and, most notably, dealt with the lack of target-like abilities of children who had spent years in such programs. She hypothesized that what was lacking was sufficient opportunities for language use. Language production moves learners from a primarily semantic use of language (as takes place in comprehension) to a syntactic use. In other words, through production, learners are forced to impose syntactic structure on their utterances. As Swain (1995, p. 128) states: "Output may stimulate learners to move from the semantic, open-ended nondeterministic, strategic processing prevalent in comprehension to the complete grammatical processing needed for accurate production. Output, thus, would seem to have a potentially significant role in the development of syntax and morphology." In addition to the argument of imposing syntactic structure on utterances, it is through production that one is able to receive feedback (either implicit or explicit), as has been shown earlier with the numerous examples of negotiation. But there are other ways in which production may be significant: (i) hypothesis testing and (ii) automaticity (cf. Gass, 1997; Swain, 1995).

While it may not always be obvious through an inspection of data alone, it is often the case that learners use a conversation precisely to test hypotheses. In a recent study in which learners were involved in interactions (videotaped) and then interviewed immediately following, Mackey et al. (2000) found evidence of an active hypothesis-testing mode. This is illustrated in (3):

(3) Hypothesis testing (INT = interviewer):

NNS: *poi un bicchiere*

then a glass

INT: *un che, come?*

a what, what?

NNS: *bicchiere*

glass

In comments provided through a stimulated recall session following this interaction, the NNS reported: "I was drawing a blank. Then I thought of a vase but then I thought that since there was no flowers, maybe it was just a big glass. So, then I thought I'll say it and see. Then, when she said 'come' (what?), I knew that it was completely wrong." The comment "I'll say it and see"

suggests that she was using the conversation as a way to see if a hypothesis was correct or incorrect.

The second significant function of production is to create greater automaticity. Automatic processes are those that have become routinized. Little effort is required to execute an automatic process (e.g., the steps involved in getting into a car and starting it are relatively automatized and require little thought). Automatic processes come about as a result of “consistent mapping of the same input to the same pattern of activation over many trials” (McLaughlin, 1987, p. 134). What this suggests is that a certain amount of practice is needed in order for language use to be routinized, that is, to take it from the labored production of early learners to the more fluent production of advanced second language speakers.

This section has dealt with requirements for learning; we next turn to an historical view of input showing how its usefulness has evolved from a behaviorist perspective (section 2) to today’s cognitive approach to acquisition (section 3).

2 The Role of Input in Early Language Learning Studies

In the early part of the twentieth century, conceptualizations or theories of how languages were learned (both first and second) relied heavily on the input provided to the learner. This was particularly the case within the behaviorist period of language study, a research tradition that can reasonably be seen as falling outside of the “modern era” of language acquisition research.⁶ Within the behaviorist orthodoxy, language acquisition was seen to rely entirely on the input that a child received because, within that framework, a child was seen to learn by imitation. Bloomfield (1933, p. 29) describes the then current view of language use as follows:

The particular speech-sounds which people utter under particular stimuli, differ among different groups of men; mankind speaks many languages. A group of people who use the same system of speech-signals is a *speech-community*. Obviously, the value of language depends upon people’s using it in the same way. Every member of the social group must upon suitable occasion utter the proper speech-sounds and, when he hears another utter these speech-sounds, must make the proper *response* [emphasis added].

He goes on to state with regard to children learning a language that: “Every child that is born into a group acquires these *habits* of speech and response in the first years of his life” (p. 29) (emphasis added). In this view language learning is heavily reliant on the concept of stimulus-response and the consequent concept of habit formation.

The same mechanistic view of language learning can be seen in some of the work focusing on second language acquisition in the mid-1900s. Fries (1957,

p. vii), recognizing the importance of basing pedagogical materials on principles of language learning, echoed the prevailing view of language learning – that of habit formation based on associations that stem from the input: “Learning a second language, therefore, constitutes a very different task from learning the first language. The basic problems arise not out of any essential difficulty in the features of the new language themselves but primarily out of the special ‘set’ created by the first language *habits*” (emphasis added). In these early approaches to understanding both first and second language acquisition, input was of paramount importance, since the input formed the basis of what was imitated and, therefore, the basis on which one created so-called language habits.

3 The Role of Input in Later Views of Language Learning

The important role of input has not diminished over the years; what has changed, however, is the conceptualization of how individuals process the input and how the input interacts with the mental capacities of those learning a language (first or second).

3.1 *The nature of input*

Within second language studies, the general function of input has been treated variably. In many approaches to SLA, input is seen as being a highly important factor in acquisition. However, in others, such as the Universal Grammar approach, input is relegated to a secondary role, interacting with an innate structure (and, in some versions, the L1) to effect acquisition. Table 9.1 (modified from Gass, 1997) provides a synoptic view of some of the major approaches to SLA over the years and the place of input within those approaches. The table specifies whether or not input must be of a specific type and attempts to specify the extent of the importance accorded to input. In the

Table 9.1 Overview of the role of input

	<i>Focus is specific input?</i>	<i>How important?</i>
Input/interaction	No	Very
Input Hypothesis (Krashen)	Yes ($i + 1$) Comprehensible input	Very
UG	Yes (related to specific parameter)	Depends
Information processing	No	Very

early 1970s, Ferguson (1971, 1975) began his investigations of special registers, for example “baby talk” – the language addressed to young children – and “foreigner talk” – the language addressed to non-proficient non-native speakers (NNS) of a language. His work was primarily descriptive and was aimed at an understanding of the similarities of these systems and, hence, the human capacity for language. (For a review of some of the features of “baby talk,” see Cruttenden, 1994, and Pine, 1994, and for some of the features of “foreigner talk,” see Gass, 1997, and Hatch, 1983.) In general, one observes linguistic modifications made by the more proficient speaker in all areas of language.⁷ For example, speech tends to be slower (and even sometimes louder); intonation is often exaggerated; syntax tends to be simpler (e.g., two sentences instead of a single sentence with a relative clause); lexical items tend to be simpler (often reflecting the more frequently used words in a language). The descriptions that have been provided in the literature have, in general, been based on descriptions of such talk within western culture. One should not overlook the fact that important differences exist between talk addressed to non-proficient speakers in western cultures and similar talk in non-western cultures (see Bavin, 1992; Nwokah, 1987; Ochs, 1985; Schieffelin, 1985; much of this work is reviewed in Lieven, 1994, and, to a lesser extent, in Gass, 1997).

3.2 *The usefulness of modified input*

Most of the debate concerning the complex relationship between simplified speech and acquisition has appeared in the child language literature. Pine (1994) provides a synopsis. In general, he concludes, following work of Snow (1986), that the functions of child-directed speech may differ depending on the developmental stage of the child. At early stages of development, the major task confronting a child is to learn vocabulary and “simple semantic forms and pragmatic functions” (p. 24). It is likely that simplified speech is appropriate for this task. However, as the child’s linguistic task becomes more complex and is focused on morphology and syntax, there is a need for more complex speech.

For second language learning, a similar situation obtains in terms of the variable nature of modified speech. Clearly, one function of modification is to make the language comprehensible, as is made evident in the modification sequence presented in (4a–f), below, from Kleifgen (1985). Kleifgen’s data show instructions being given to a group of kindergarten children by their teacher. The class was a mixed class, consisting of English native-speaking (NS) children and non-native speakers of English with a range of proficiency levels. It is quite clear from the examples that the teacher is making modifications in order to ensure comprehension:

- (4) Data from Kleifgen (1985):
- a Instructions to English NSs in a kindergarten class:
These are babysitters taking care of babies. Draw a line from Q to q. From S to s and then trace.

- b To a single NS of English:
Now, Johnny, you have to make a great big pointed hat.
- c To an intermediate-level native speaker of Urdu:
No her hat is big. Pointed.
- d To a low-intermediate-level native speaker of Arabic:
See hat? Hat is big. Big and tall.
- e To a beginning-level native speaker of Japanese:
Big, big, big hat.
- f To a beginning-level native speaker of Korean:
Baby sitter. Baby.

These examples reveal the way the teacher adjusts her speech, most likely to ensure comprehension⁸ on the part of all students; the data also illustrate the changing nature of input – the nature of the input reflects the perceived proficiency level of one’s interlocutor.

Clearly, not all input serves the same learning purpose. For example, Parker and Chaudron (1987) found a greater correlation between comprehension of an elaborated passage and independent reading measures than between comprehension of a simplified passage and independent measures of reading. Yano, Long, and Ross (1994) also distinguished between simplified and elaborated input, finding no significant difference in learners’ comprehension. They argue that it is the greater amount of semantic detail available in an elaborated text that allows learners to make inferences from the text. Traditionally simplified texts do not provide this richness.

3.3 *Input processing*

A crucial question in understanding the role of input relates to processing. VanPatten and his colleagues have been concerned with what they refer to as input processing (VanPatten, 1995, 1996; VanPatten and Cadierno, 1993a, 1993b; VanPatten and Sanz, 1995), which deals with presentation and timing of input. Their research, conducted within a pedagogical context, relies on the concept of attention to form and its role as a learner moves from input to intake and then to output. In VanPatten’s studies, two instructional models were compared: (i) grammatical information (i.e., input) is presented to the learner and then practiced, and (ii) the input is presented before an internalized system begins to develop; in other words, there is an attempt to influence how the input will be processed and hence how an internalized system develops. The results of these studies suggest a positive effect for the second model of presentation over the first. In a replication⁹ study of VanPatten and Cadierno (1993a), VanPatten and Oikkenon (1996) attempted to determine the extent to which explicit information provided during processing instruction was the source of the beneficial effect of processing. Their study involving learners of Spanish showed that it was the structured input activities and not the explicit information that resulted in the beneficial effects of instruction. In another replication

study of VanPatten and Cadierno (1993a, 1993b), DeKeyser and Sokalski (1996) looked specifically at the effects of production versus comprehension activities. Their results (also based on data from learners of Spanish) do not support those of the original studies. In particular, they noted that practice at the level of input versus practice at the level of output differentially affected comprehension and production, with the former being better for comprehension and the latter for production, leading the researchers to suggest that the skills of comprehension and production are learned separately. Results also depended on the structure tested (conditionals and direct object clitics), further suggesting the complexity of studying input processing.

Similar work was conducted by Tomasello and Herron (1988, 1989).¹⁰ They compared two groups of English learners of French. Their work dealt with retreating from overgeneralized errors. One group was presented with grammatical instruction, including exceptions to a rule; they then practiced those forms (as in group 1 of the VanPatten studies). The second group was not presented with the exceptions from the outset; rather, they were presented with a rule and were then induced to make an overgeneralized error, at which point correction occurred. The type of input that allowed corrective feedback to occur after the learner had made an error was more meaningful than input that attempted to prevent an error from occurring. In other words, allowing a natural process to occur and “interrupting” it has a greater likelihood of bringing the error to a learner’s attention.

In sum, we have shown the variable nature of input, its possible functions, and finally, how it can be investigated with an eye to processing, in an effort to understand how learners actually take input and convert it into something meaningful as part of the process of grammar formation.

4 Interaction

In this section we provide descriptive background on interaction. As mentioned in section 3.1, some of the early work on input focused on the ways that proficient speakers (generally native speakers) modify their speech, presumably with the goal of making their speech comprehensible, to those with limited knowledge of the target language. Within that early tradition, consideration of an entire conversational structure was not an object of investigation.

4.1 Descriptions of interaction

Wagner-Gough and Hatch (1975) were among the first second language researchers to consider the role of conversation in the development of a second language. Their work was followed by pioneering work of Long (1980), who refined the notion of conversational structure, showing (at least quantitative) differences between NS/NNS conversations and NS/NS conversations. He proposed that there was more than just simple native speaker modification to

consider; in addition, one needed to look at the interactional structure itself. When compared with interactional structures of NS/NS conversations, NS/NNS conversations showed a greater amount of interactional modification. Examples of these are provided below.

In confirmation checks, one conversational partner checks to make sure that they have correctly understood what his or her conversational partner has said:

- (5) Confirmation check (from Mackey and Philp, 1998):
NNS: what are they (.) what do they do your picture?
→ NS: what are they doing in my picture?
NS: there's there's just a couple more things
NNS: a sorry? Couple?

With comprehension checks, speakers may have some idea that their conversational partner has not understood. They seek to determine whether this is the case or not:

- (6) Comprehension check (from Varonis and Gass, 1985a):
NNS1: and your family have some ingress
NNS2: yes ah, OK OK
→ NNS1: more or less OK?

In (7), there is a recognized lack of comprehension and one party seeks to clarify:

- (7) Clarification request (from Oliver, 1998):
NNS1: Where do I put-?
→ NNS2: What?
NNS1: The pl[a]nt
NNS2: The pl[a]nt
→ NNS: What's that pl[a]nt?

Other modification types also exist, for example, reformulations such as "or choice" questions, as in example (8), where the native speaker asks a question and upon an obvious sign of non-comprehension rephrases the question giving alternatives for the non-native speaker to choose from:

- (8) From Varonis and Gass (1985b):
NS: What did you want? A service call?
NNS: uh 17 inch huh?
→ NS: What did you want a service call? or how much to repair a TV?

Other modifications include topic-focused questions, as in example (9):

- (9) From Larsen-Freeman and Long (1991):
NS: When do you go to the uh Santa Monica?
→ You say you go fishing in Santa Monica, right?
NNS: Yeah
NS: When?

In (9), the NS takes the original questions, which include the concepts of fishing and the location of Santa Monica, and establishes them as the topic before proceeding to the crucial part of the question, "when?"

In (10) is an elaborated question in which the NS, probably recognizing that the NNS has had problem with "daily meals," exemplifies the term:

- (10) Eavesdropped by Gass:
NS: Where do you eat your daily meals?
NNS: Daily meals?
→ NS: Lunch and dinner, where do you eat them?

and recasts, as in (11) (also in (5)). In this example, the NS "recasts" (see section 5.3) the ungrammatical NNS utterance as a grammatical sentence:

- (11) From Philp (1999):
NNS: why he want this house?
→ NS: why does he want this house?

4.2 *The function of interaction: the Interaction Hypothesis*

The line of research that focuses on the interactional structure of conversation was developed in the following years by many researchers (see, e.g., Gass and Varonis, 1985, 1989; Long, 1981, 1983; Pica, 1987, 1988; Pica and Doughty, 1985; Pica, Doughty, and Young, 1986; Pica, Young, and Doughty, 1987; Varonis and Gass, 1985a). The emphasis is on the role which negotiated interaction between native and non-native speakers and between two NNSs¹¹ plays in the development of a second language. That early body of research as well as more recent work has taken as basic the notion that conversation is not only a medium of practice, but also the means by which learning takes place. In other words, conversational interaction in a second language forms the basis for the development of language rather than being only a forum for practice of specific language features. This has been most recently expressed by Long (1996, pp. 451–2) as the Interaction Hypothesis:

negotiation for meaning, and especially negotiation work that triggers *interactional* adjustments by the NS or more competent interlocutor, facilitates acquisition because it connects input, internal learner capacities, particularly selective attention, and output in productive ways.

and:

it is proposed that environmental contributions to acquisition are mediated by selective attention and the learner's developing L2 processing capacity, and that these resources are brought together most usefully, although not exclusively, during *negotiation for meaning*. Negative feedback obtained during negotiation work or elsewhere may be facilitative of L2 development, at least for vocabulary, morphology, and language-specific syntax, and essential for learning certain specifiable L1-L2 contrasts. (p. 414)

What is intended is that through focused negotiation work, the learner's attentional resources may be oriented to (i) a particular discrepancy between what she or he "knows" about the second language and what is reality vis-à-vis the target language, or (ii) an area of the second language about which the learner has little or no information. Learning may take place "during" the interaction, or negotiation may be an initial step in learning; it may serve as a priming device (Gass, 1997), thereby representing the setting of the stage for learning, rather than being a forum for actual learning. In (12), we see an example of recognition of a new lexical item as a result of negotiation of that word. This illustrates how the learner may have used the conversation as a resource to learn the new phrase *reading glasses*:

(12) From Mackey (1999):

- NS: there's there's a pair of reading glasses above the plant
 NNS: a what?
 NS: glasses reading glasses to see the newspaper?
 NNS: glassi?
 NS: you wear them to see with, if you can't see. Reading glasses
 → NNS: ahh ahh glasses to read you say reading glasses
 NS: yeah

In the penultimate line, the NNS acknowledges the fact that the new word "reading glasses" came from the interaction and, in particular, as a consequence of the negotiation work. We return to the Interaction Hypothesis in section 5, where we present some of the recent empirical evidence relating specifically to the relationship between interaction and learning.

Example (13) illustrates "delayed" learning. Two NNSs were involved in a picture-description task. NNS1 is describing a part of the picture and initiates the description with an incorrectly pronounced word which NNS2 immediately questions. NNS1 most likely ponders the pronunciation problem, never again mispronouncing *cup*. To the contrary, after some time, she correctly pronounces *cup*. In other words, the negotiation itself made her aware of a problem; she was then able to listen for more input until she was able to figure out the correct pronunciation:

- (13) From Gass and Varonis (1989):
NNS1: Uh holding the [k^p]
NNS2: Holding the cup?
NNS1: Hmm hmmm . . .
(seventeen turns later)
NNS2: Holding a cup
NNS1: Yes
NNS2: Coffee cup?
NNS1: Coffee? Oh yeah, tea, coffee cup, teacup.
NNS2: Hm hm.

It is important to point out that the Interaction Hypothesis is agnostic as to the role of UG. In other words, no claims are made about the ultimate source of syntax that a learner uses as he or she creates hypotheses. This will be returned to briefly in the concluding section of this chapter. Before turning to a discussion of what is involved in the relationship between interaction and learning, we present a brief background on the type of language information needed for learning.

5 Data as Evidence for the Interactionist Position

5.1 *Difficulties in determining learning*

In the preceding sections we discussed the concept of interaction, in particular focusing on the structure of conversations in which non-native speakers are involved. We noted that often the structure is such that there are multiple instances of what has been termed negotiation, as shown in (2). But, in that example, is there any evidence that anything other than “mimicking” is at play? We repeat the example here for the sake of convenience:

- (14) From Mackey, Gass, and McDonough (2000):
NNS: There's a basen of flowers on the bookshelf
NS: a basin?
NNS: base
NS: a base?
NNS: a base
NS: oh, a vase
NNS: vase

Here, the NNS and the NS appear to be negotiating their way to a successful conclusion where the NS finally understands that the NNS is talking about a vase rather than a basin, but has the NNS really learned “vase,” or is she only repeating the NS without true understanding? This is a perennial problem in

determining the extent to which such exchanges result in learning (i.e., was the word “vase” learned?) or serve only as negotiation for meaning with no consequent learning. Hawkins (1985) questions whether apparent acknowledgment of understanding truly reflects understanding at all. She presents the following example taken from a game in which a NS and a NNS are trying to order parts of a story to make a coherent whole:

(15) From Hawkins (1985):

NS: Number two, . . . is . . . the man . . . look for help

NNS: Uh-huh, ((yes)) for help.

NS: Help, you know. . . . “Aah! Help” (shouts softly)

NNS: Uh-huh. ((yes))

NS: No *Up* . . . *HELP*.

→ NNS: Help

NS: Yeah . . . He asked, . . . he asked . . . a man . . . for . . . help.

→ NNS: . . . for help

NS: Yeah . . . he asked . . . the man . . . for telephone.

Within the interactionist tradition, one might be tempted to take the last two NNS responses *help, for help* as suggesting that the learner had indeed understood, and one might even be attempted to assume that the acknowledgment of comprehension signified an initial step in the learning process. However, through retrospective comments from the participants in this exchange, Hawkins showed that indeed no comprehension had taken place vis-à-vis the meaning of the word *help*; rather it is likely that the complex phenomenon of social relationships had led the NNS not to pursue the lack of understanding.¹²

Another instance might be useful in illustrating the difficulties in attributing cause to conversational production. Houck and Gass (1996) present the following example. A NS and a NNS were beginning a discussion about an assignment for an SLA class:

(16) From Houck and Gass (1996):

NS: Okay, so we’re just gonna give our opinions about these. Uhm, do you have an overall opinion?

NNS: Do I have a overall (one)? Uhm. (longish pause – head movement and smile).

Again, within the interactionist tradition, this might be seen as a negotiation routine with the NNS perhaps questioning the meaning of “overall one.” However, a closer examination of the data suggests that what was in actuality taking place was a difference in discourse style. The NNS (a native speaker of Japanese) appears to be thrown by the abruptness of the initial question. It is typical in Japanese discussions of this sort to have an initial exchange about procedures. On the other hand, Americans will typically begin with *OKAY*, as

this speaker did, and then jump right in (Watanabe, 1993). As Houck and Gass argued, the problem was a global discourse one (as opposed to a language one) and the apparent negotiation for meaning was only reflective of the unexpectedness of the discourse opening.

5.2 *Linking interaction and learning*

In the preceding section we discussed some of the difficulties in determining the extent to which learning arises from conversation. However, there are true instances when learning appears to occur as a result of negotiation work. Gass and Varonis (1989) provided the example in (13) which suggests something beyond the immediate “echo” of an appropriate response. In other words, evidence of forms which were “corrected” through negotiation work appear later in a learner’s production. As Gass and Varonis noted, these negotiated forms are incorporated into a learner’s speech.

In the past few years, scholars have attempted to make the link between interaction and learning more explicit and direct. This is, of course, a difficult task, since one can rarely come to know the full extent of input to a learner or observe all of the interactions in which a particular learner participates. One of the earliest of such researchers was Sato (1986, 1990), who questioned a direct positive relationship between interaction and development. In her study of the acquisition of English by two Vietnamese children, she suggested that interaction did not foster development, at least in the specific area of morphosyntax that she was investigating (past tense marking). As she acknowledged, this might have been due to the particular structure investigated, since past tense marking is not crucial to an understanding of the time referent. Loschky (1994) investigated the effects of comprehensible input and interaction on vocabulary retention and comprehension. The results from his study were largely inconclusive. Negotiation had a positive effect on comprehension, but no such claim could be made for retention. Ellis, Tanaka, and Yamazaki (1994) also investigated the role of negotiation in vocabulary acquisition and word order. In that study, interactionally modified input yielded better comprehension rates and resulted in the acquisition of more new words.

Polio and Gass (1998) conducted a study similar to that of Gass and Varonis (1994), to be discussed below. NNSs had to describe where to place objects on a board. The extent to which the NSs were able to understand NNSs’ descriptions was determined by how accurately the NS actually placed the object. Half of the NS/NNS dyads completed the task with no interaction and half completed it with interaction. Polio and Gass found a positive effect for negotiated interaction on production (measured by NS comprehension).

In an interesting analysis of the talk of eighth grade students in a French immersion program, Swain and Lapkin (1998) specifically argued, through the analysis of one particular dyad, that the talk itself mediates actual learning.

5.3 What kind of interaction? Negotiation and recasts

The question arises as to the efficacy of different types of feedback to learners. In this section, two types of feedback are considered: negotiation and recasts. The former have been dealt with extensively throughout this chapter; the latter refer to those instances in which an interlocutor rephrases an incorrect utterance with a corrected version, while maintaining the integrity of the original meaning. We will not detail the complexities of recasts here (are they partial recasts? full recasts? in response to a single error? in response to multiple errors?), but will present two examples which illustrate the form that they take. In (17), a recast with rising intonation, the auxiliary is added and the verbal morphology is corrected. In (18) the verb form is corrected (from future to subjunctive, required after *avant que*) without rising intonation:

- (17) From Philp (1999, p. 92):
 NNS: What doctor say?
 NS: What is the doctor saying?
- (18) From Lyster (1998, p. 58) (St = student; T3 = teacher):
 St: Avant que quelqu'un le prendra
 before someone it will take
 'Before someone will take it'
 T3: Avant que quelqu'un le prenne
 before someone it takes
 'Before someone takes it'

In recent years, there have been a number of studies in which recasts, as a form of implicit negative feedback, have been the focus. With regard to their effectiveness, the results are mixed. Lyster and Ranta (1997) collected data from grades 4–6 children in French immersion programs. Their research considered recasts by teachers following errors and, importantly, the reaction by the student (*uptake*, in their terminology) in the subsequent turn. They argue that uptake “reveals what the student attempts to do with the teacher’s feedback” (p. 49). Their results showed that, despite the preponderance of recasts in their database, recasts were not particularly effective. Other types of feedback led more successfully to student-generated repair.

Using the same database reported on in the Lyster and Ranta (1997) study, Lyster (1998) divided recasts into four types depending on whether the recast was a declarative or interrogative and whether it sought confirmation of the original utterance or provided additional information. He found that there was some confusion between the corrective and approval functions of recasts. He argued that recasts may not be particularly useful in terms of corrective feedback, but they may be a way that teachers can move a lesson forward by focusing attention on lesson content rather than on language form.

Other studies do show a positive effect for recasts, while highlighting two main problems in research on recasts: (i) the concept of uptake, and (ii) the data to be included in an analysis.

Mackey and Philp (1998) point out that uptake, as defined by Lyster and Ranta, may be the wrong measure to use in determining effectiveness. Their data represent an attempt to go beyond the turn immediately following a recast. They make the point (cf. Gass, 1997; Gass and Varonis, 1994; Lightbown, 1998) that if one is to consider effectiveness (i.e., development/acquisition), then one should more appropriately measure delayed effects. In particular, they considered the effects of interaction with and without recasts on learners' knowledge of English questions. Their results showed that for more advanced learners, recasts plus negotiation were more beneficial than negotiation alone. This was the case even though there was not always evidence for a reaction by the learner in the subsequent turn.

Additional research that attempts to determine the role of recasts (in this case as opposed to models) is a study by Long, Inagaki, and Ortega (1998), who investigated (i) the acquisition of ordering of adjectives and a locative construction by English learners of Japanese, and (ii) the acquisition of topicalization and adverb placement by English learners of Spanish. Their results were mixed, inasmuch as only one of the learner groups (Spanish) showed greater learning following recasts as opposed to models. Further, these findings were true for adverb placement only.

A second problem, having to do with the data used for analysis, was noted by Oliver (1995). After a recast, there is frequently no opportunity for the original speaker to make a comment. This may be due to a topic shift, as in (19), or the inappropriateness of making a comment, because the recast had been in the form of a *yes/no* question and the appropriate response would not be a repetition, but a *yes/no* response:

(19) From Oliver (1995, p. 472):

NNS: a [c]lower tree.

NS: A flower tree. How tall is the trunk?

When the lack of opportunity/appropriacy is included, the percentage of "incorporated" recasts greatly increases. Lyster (1998) argued that the contexts of language use (child-child dyadic interactions in Oliver's research and teacher-student interactions in Lyster's own work) are different, and that, in fact, in classrooms the teacher often keeps the floor, thereby, as mentioned earlier, drawing attention to content and not to language form.

5.4 *The progression of research within the interactionist tradition: two examples*

Much of the research specifically intended to investigate the direct relationship between interaction and learning suffers from methodological difficulties

in determining a cause and effect relationship. In what follows, we highlight two studies because they represent a progression in the kind of research that has been conducted (boxes 9.1 and 9.2). It is probably not a coincidence that their titles are similar, with the only crucial change in the last word (*production* in the Gass and Varonis title and *development* in the Mackey title).

These two studies were selected for their similarity in goals and, importantly, because they illustrate a progression in the development of this area of inquiry. In both studies, the researchers were concerned with the potential effects of interaction on language development. However, there are significant differences which, in a sense, reflect the development of the field. In the Gass and Varonis study, published five years prior to Mackey's work, the researchers dealt with a shorter time span (from the execution of the first board game to the execution of the second). In the Mackey study, the time period covered approximately five weeks – clearly a more persuasive snapshot of the learning effects of interaction. A second difference is in the measurement of learning. In the Gass and Varonis study, learning was operationalized in terms of comprehension and production, whereas the Mackey study attempted to measure particular learning effects through a pre-test/post-test design. The Gass and Varonis design was such that little specific information could be obtained on the change over time of particular grammatical structures. The goal was to gain an overall picture of the effects of interaction. Mackey's design, which focused specifically on question formation, was able to isolate certain developmental features of questions, enabling her to provide answers on the issue of development.

In sum, these two studies both address the same questions, albeit at a distance of five years, and both show the effects of interaction on production/learning.

5.5 *Conversation and learning requirements*

The interactionist position is one that accords an important role to conversation as a basis for second language learning. In section 1, we dealt with three requirements of learning (positive evidence [input], negative evidence [feedback], and output) and suggested the role that they might play in learning and the ways in which conversation is involved in their effectiveness.

But conversation is obviously not the only forum for language information for second language learners. In some ways conversation plays a (near) privileged role; in others it plays a significant, although not necessarily privileged role. Positive evidence, clearly a crucial part of the acquisition picture, is an example of the latter because conversation is only one of many ways of obtaining positive evidence (reading, listening to a lecture, and listening to television/radio are but some of the other ways). In this sense, for the purpose of obtaining positive evidence, conversation does not play a privileged role in acquisition. A more important role for conversation relates to the obtaining of negative evidence. Here conversation may have a more important role to play

Box 9.1 Gass and Varonis (1994)

Research questions:

- i Does modified input result in better NNS comprehension and better production?
- ii Does interaction yield better NNS comprehension and better L2 production?
- iii Does interaction yield better NS comprehension?

Predictions:

- i Modified input results in better NNS comprehension and better production.
- ii Interaction yields better NNS comprehension and better L2 production.
- iii Interaction yields better NS comprehension.

Participants:

Sixteen native speakers of English and 16 non-native speakers of English (various L1s).

Methodology:

Task: Each NS–NNS dyad completed two board-game tasks in which each participant had a board depicting an outdoor scene. On one, objects were permanently affixed. The other board had the same objects to the side. The individual with the permanently affixed board had to describe to his or her partner where to place the objects.

Groups: The 16 dyads were divided into two subgroups: a modified input group and an unmodified input group (see figure 9.1). The groups were differentiated by the type of input provided on the initial part of the task. These two subgroups of eight dyads were further subdivided into two more subgroups according to whether or not normal interaction was allowed on the first board description task. These four groups were further subdivided as to whether or not interaction was allowed on the second board description task.

Procedure: On the first board description task, the NS described to the NNS. These descriptions were “scripted” on the basis of prior data gathered differentiating between modified and unmodified input. On the second task, the NNS described a different board scene to the NS.

Operationalization:

- i Comprehension by NNS = Accurate placement of objects by NNS on task one.
- ii Comprehension by NS = Accurate placement of objects by NS on task two in interaction condition on task two.
- iii Accurate production by NNS; accurate placement of objects by NS on task two in condition in which task one included interaction.

Results: Modified input yielded better NNS comprehension than unmodified input. Interaction yielded better NNS comprehension. Interaction did not yield better NS comprehension. Prior interaction yielded better L2 production. Prior input modification did not yield better L2 production.

Conclusion: Evidence of interaction having an effect on L2 production; no specific claims of learning.

Box 9.2 Mackey (1999)

Research questions:

- i Does conversational interaction facilitate second language development?
- ii Are the developmental outcomes related to the nature of the conversational interaction and the level of learner involvement?

Main prediction: Interaction focused on specific morphosyntactic structures will lead to an increase in production of structures at higher developmental levels.

Linguistic structure tested: Question formation (following Pienemann and Johnston [1987]).

Participants: Thirty-four adult ESL learners (various L1s) and 6 NSs.

Methodology:

Five groups:

- i *Interactors* ($n = 7$): NS/NNS pairs participated in a task-based activity in which interaction was allowed.
- ii *Interactor Unreadies* ($n = 7$): NS/NNS pairs participated in a task-based activity in which interaction was allowed. They differed from the “Interactor” group in that they were developmentally lower than it vis-à-vis English question formation.
- iii *Observers* ($n = 7$): NNS who only observed an interaction (but did not participate).
- iv *Scripted* ($n = 6$): NS/NNS pairs participated in the same task, but the input from the NSs was premodified.
- v *Control* ($n = 7$): no treatment.

Procedure: Seven sessions:

- pre-test;
- three treatment sessions (on the three days subsequent to the pre-test);
- three post-tests: (a) one on the day following the last treatment session, (b) one one week after (a), and (c) one three weeks after (b).

Results: The interactor groups combined ((i) and (ii)) showed greater improvement than the other groups and the increase was maintained. All groups increased the number of higher-level questions (see Pienemann and Johnston [1987]), but only the two “Interactor” groups and the “Scripted” group maintained the increase in all post-tests.

Conclusion: Interaction led to development. More active involvement led to greater development.

since there are fewer possibilities (and fewer opportunities) for obtaining information about incorrect forms or ungrammaticality. In other words, conversation may not be the only way of obtaining negative evidence, but other possibilities (e.g., teacher correction) are limited. Perhaps the most important

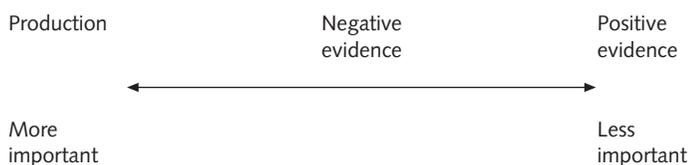


Figure 9.1 Conversation and language learning requirements

role for conversation can be found in production, particularly production where hypothesis testing and the increase of automaticity are involved. As mentioned in section 1.3, conversation is one of the few forums in which learners can reap those benefits assigned to production. Figure 9.1 illustrates the value of conversation relative to these three requirements of acquisition.

6 Attention

The two studies highlighted in section 5.4 and other similar ones (e.g., Philp, 1999) suggest that interaction and learning are related. This observation is an important one, but is in need of an explanation in order to advance our understanding of how learning takes place. That is, what happens during a negotiation event that allows learners to utilize the content of the negotiation to advance their own knowledge? Long's (1996) Interaction Hypothesis, given in section 4.2, suggests an important role for attention, as does Gass (1997, p. 132): "Attention, accomplished in part through negotiation, is one of the crucial mechanisms in this process."

We turn now to the concept of attention as a way of accounting for the creation of new knowledge and/or the modification (restructuring) of existing knowledge. In the recent history of SLA research, much emphasis has been placed on the concept of attention and the related notion of noticing (cf. Doughty, 2001, for an extended discussion of processing issues during focus on form instruction). Schmidt (1990, 1993a, 1993b, 1994) has argued that attention is essential to learning; that is, there is no learning without attention. While this strong claim is disputed (cf. Gass, 1997; Schachter et al., 1998), it is widely accepted that selective attention plays a major role in learning. Schmidt (1998, 2001) has modified his strong stance and acknowledges that learning may occur without learners being aware of learning, but he also claims that such learning does not play a significant role in the larger picture of second language learning. It is through interaction (e.g., negotiation, recasts) that a learner's attention is focused on a specific part of the language, specifically on those mismatches between target language forms and learner-language forms. Doughty (2001) points out that this assumes that these mismatches are indeed noticeable (cf. Truscott, 1998, for a discussion of attention, awareness, and

noticing) and that, if they are noticeable and if a learner is to use these mismatches as a source for grammar restructuring, he or she must have the capacity to hold a representation of the TL utterance in memory while executing a comparison. Doughty provides three ways in which such a cognitive comparison could work (p. 18):

- 1) Representations of the input and output utterances are held in short term memory and compared there
- 2) Only a deeper (semantic) representation of the already-processed utterance is held in long-term memory, but it leaves useable traces in the short term memory against which new utterances may be compared; and
- 3) The memory of the utterance passes to long term memory but can readily be reactivated if there is any suspicion by the language processor that there is a mismatch between stored knowledge and incoming linguistic evidence.

There is anecdotal and empirical evidence in the literature that indeed learners are capable of noticing mismatches. Schmidt and Frota (1986) report on Schmidt's learning of Portuguese, in which he clearly documents his noticing of new forms. There is also anecdotal evidence that suggests that learners learn new forms as a result of conversation (see example (9) above). In an empirical investigation of just this issue, Mackey et al. (2000) provided data showing that learners do indeed recognize feedback through interaction, although it is not always the case that what is intended through negative feedback is what the learner perceives. Through stimulated recalls, Mackey et al. investigated three types of linguistic feedback (phonological, lexical, and morphosyntactic) in two groups of learners (English as a second language and Italian as a foreign language), and the perception of the feedback by the learners. In other words, Mackey et al.'s research question concerned the extent to which learners recognized feedback, and in the event that they did, whether they recognized it as intended. In (20–2), we present examples of each of these three areas of feedback, along with the stimulated recall comments:

(20) Morphosyntactic feedback (perceived as lexical feedback):

- NNS: *c'è due tazzi*
There is two cups (m. pl.)
- INT: *due tazze- come?*
Two cup- what?
- NNS: *tazzi, dove si può mettere té, come se dice questo?*
Cups (m. pl.), where one can put tea, how do you say this?
- INT: *tazze?*
Cups (f. pl.)?
- NNS: *ok, tazze*
Ok, cups (f. pl.)
- RECALL: I wasn't sure if I learned the proper word at the beginning.

- (21) Phonological feedback correctly perceived:
- NNS: vincino la tavolo è
 near the table is (the correct form is *vicino*)
- INT: vicino?
 near?
- NNS: la, lu tavolo
 the ? table
- RECALL: I was thinking . . . when she said *vicino* I was thinking, OK
 did I pronounce that right there?
- (22) Lexical feedback correctly perceived:
- NNS: there is a library
- NS: a what?
- NNS: a place where you put books
- NS: a bookshelf?
- NNS: bok?
- NS: shelf
- NNS: bookshelf
- RECALL: That's not a good word she was thinking about library like
 we have here on campus, yeah.

While the results were not identical for the two groups of learners, it was generally the case that morphosyntactic feedback was not recognized as such (less than 25 percent by either group), whereas lexical and phonological feedback were more likely to be recognized as such. Phonological feedback was accurately recognized in 60 percent of the cases by the ESL group and 21 percent by the Italian group; lexical feedback was accurately recognized 83 percent of the time by the ESL group and 66 percent by the Italian group.

These results suggest that there may be a differential role for feedback in different linguistic areas,¹³ as suggested by Pica (1994). It may be that morphosyntactic feedback is not noticed because, as is typical in a conversational context, individuals are focused on meaning, not on language form. Phonological and lexical errors can interfere with basic meaning and hence need to be attended to on the spot if shared meaning is to result; the morphosyntactic examples in the Mackey et al. study generally dealt with low-level, non-meaning-bearing elements.

7 The Theory of Contrast

Earlier in this chapter we dealt with the concept of negative evidence and the fact that corrective feedback cannot be relied upon in language learning (either first or second). In this section, we consider a broadened definition of negative evidence, one that relies heavily on conversational interaction. In so doing, we are not making the argument that negative evidence can indeed replace the

need for an innate structure; rather, our point is simply that the concept of negative evidence and learners' ability to attend to corrective feedback needs to be broadened. We take the following definition from Saxton (1997), whose definition of negative evidence departs somewhat from the more general definition provided by Pinker (1989) and others. Saxton (1997, p. 145) defines negative evidence as follows: "Negative evidence occurs directly contingent on a child error (syntactic or morphosyntactic), and is characterized by an immediate contrast between the child error and a correct alternative to the error, as supplied by the child's interlocutor." This definition allows researchers to determine what the "corrective potential" of an utterance is vis-à-vis two factors: (i) the linguistic content of the response and (ii) the proximity of the response to an error (p. 145). It is not clear from this definition from whose perspective negative evidence is to be viewed. In fact, Saxton (p. 145) states that "there is ample evidence that negative evidence, as defined here, is supplied to the child." However, it is more important to view negative evidence from the perspective of the learner (child or adult second language learner) and to understand what learners are doing with the information that is provided.

Saxton (1997) proposes what he calls the "Direct Contrast Hypothesis." This is defined within the context of child language acquisition as follows:

When the child produces an utterance containing an erroneous form, which is responded to immediately with an utterance containing the correct adult alternative to the erroneous form (i.e. when negative evidence is supplied), the child may perceive the adult form as being in *contrast* with the equivalent child form. Cognizance of a relevant contrast can then form the basis for perceiving the adult form as a correct alternative to the child form [emphasis in original]. (p. 155)

The fact that a correct and an incorrect form are adjacent is important in creating a conflict for the learner. The mere fact of a contrast or a conflict draws a learner's attention to a deviant form. The contrast can be highlighted as a result of recasts or through negotiation work. Saxton specifically tests two competing hypotheses, one nativist and one relying on Contrast Theory. The nativist hypothesis suggests that negative evidence, even when occurring adjacent to a child error, should be no more effective than positive evidence in bringing about language change. Contrast Theory says that the former will be more effective than the latter. Saxton's research with children suggests that Contrast Theory makes the correct prediction. Children reproduced correct forms more frequently when the correct form was embedded in negative as opposed to positive evidence. As with some of the SLA literature reported above, the correct form was seen in immediate responses; hence, there is no information about long-term effectiveness.

This is not unlike what has been dealt with in the SLA literature under the rubric of "noticing the gap," that is, noticing where learner production and target language forms differ. Conversation provides the means for the contrast to become apparent. The immediate juxtaposition of correct and erroneous

forms may lead a learner to recognize that his or her own form is in fact erroneous. However, many problems remain, as Doughty (2001) points out. What is the function of working memory? What happens when learners take the next step, which undoubtedly (at least in the case of syntax or morphosyntax) involves some sort of analysis? Contrasts occurring within the context of conversation often do not have an immediate outcome. Research has not yet been successful at predicting when a single exposure – for example, through a negotiation sequence or a recast – will suffice to effect immediate learning and when it will not.

It is likely that there are limitations to what can and cannot be learned through the provision of negative evidence provided through conversation. One possibility is that surface-level phenomena can be learned, but abstractions cannot. This is consistent with Truscott's (1998) claim that competence is not affected by noticing. Negative evidence can probably not apply to long stretches of speech, given memory limitations (see Philp, 1999). But it may be effective with low-level phenomena, such as pronunciation or basic meanings of lexical items. Future research will need to determine the long-term effects of interaction on different parts of language (see Gass, Svetics, and Lemelin, forthcoming).

NOTES

- 1 See Pinker (1994, pp. 277–8), who takes the position that the nature/nurture argument is a false dichotomy. He makes the point that if wild children “had run out of the woods speaking Phrygian or ProtoWorld, who could they have talked to?” (p. 277). In other words, nature provides part of the answer and nurture provides another.
- 2 Within the behaviorist view, “errors” were eliminated by correction. When a child said something that contained an error, the so-called error was corrected and thereby eliminated. We now know that there are a number of reasons why this position is not sufficient to account for language learning. First, as (i) shows, children don't always focus on the correction (Cazden, 1972, p. 92):

- (i) Child: My teacher holded the baby rabbits and we patted them.
 Adult: Did you say your teacher held the baby rabbits?
 Child: Yes.
 Adult: What did you say she did?
 Child: She holded the baby rabbits and we patted them.
 Adult: Did you say she held them tightly?
 Child: No, she holded them loosely.

Second, correction is not consistent. That is, the pressures of the moment may preclude a more proficient interlocutor from making all corrections. And, third, even when

- correction does occur, it is not always the case that the “correct” solution is provided.
- 3 All three of these evidence types are treated in the literatures on both first and second language acquisition. However, perhaps with the exception of positive evidence, they play a different role in first and second language acquisition. The comments in this section are restricted to the case of second language acquisition.
 - 4 Indirect negative evidence will not be dealt with in this chapter because it is the least relevant in a discussion of interaction. It is, nonetheless, perhaps the most interesting of the types of evidence that learners can avail themselves of. Unfortunately, it is the least studied, perhaps because no theoretical arguments rest crucially on it. Chomsky (1981, pp. 8–9), in discussing evidence types, states:

indirect negative evidence – a not unreasonable acquisition system can be devised with the operative principle that if certain structures or rules fail to be exemplified in relatively simple expressions, where they would be expected to be found, then a (possibly marked) option is selected excluding them in the grammar, so that a kind of “negative evidence” can be available even without corrections, adverse reactions, etc. There is good reason to believe that direct negative evidence is not necessary for language acquisition, but indirect negative evidence may be relevant.
 - 5 learner know that a feature is not possible because it is never present in the *expected* environment.”
 - 5 A discussion of the extent to which the input consists of well-formed sentences can be found in White (1989).
 - 6 Snow (1994) places the beginnings of “modern child language research” to the 1964 publication of Brown and Bellugi.
 - 7 While there have been some reports of ungrammatical speech to non-native speakers (particularly in high- to lower-status situations and to low proficiency learners; cf. Gass, 1997), in most cases non-native directed speech is grammatical albeit modified in the ways discussed in this section.
 - 8 We do not intend to discuss the role of comprehension in any detail. It should be noted, however, that a minimal requirement of acquisition is that the language has been comprehended (see Gass, 1997, for a discussion of levels of comprehension) in the traditional sense of the word comprehension.
 - 9 This and the DeKeyser and Sokalski study (1996, discussed below) are intended to be replication studies (see Polio and Gass, 1997, for further discussion of replication studies). However, there is a crucial difference that makes the results somewhat non-comparable – the participant population. In the VanPatten and Cadierno studies, participants were from second year university-level Spanish classes; in the DeKeyser and Sokalski study, they were from first year university-level Spanish classes; in the VanPatten and Oikkenon study (1996, discussed below), participants were from fourth semester high school Spanish classes.
- As Plough (1994, p. 30) states, it is an “indirect means of letting the

- 10 See criticisms of this research by Beck and Eubank (1991) and the response by Tomasello and Herron (1991).
- 11 Most of the research in second language acquisition within this framework has considered dyads rather than large groups of conversational participants. This is, in some sense, an accident of research design, or more likely due to the ease with which dyadic conversational data can be gathered. This should not be taken to imply that conversations with more than two individuals do not serve the same purpose as dyadic conversations. It only means that larger groups engaged in conversations have not been investigated to any significant extent in the second language literature.
- 12 The burden of continuing a conversation with a non-proficient and non-understanding participant is often too great. Instead, participants opt out and either end the conversation or change the topic completely.
- 13 It must be recognized that reporting and noticing are not isomorphic. Because something is not reported does not necessarily mean that it has not been noticed. However, not reporting something when probed (as in Mackey et al., 2000) may be suggestive of its not being noticed.

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