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Second Language Learning Through Interaction: Multiple Perspectives

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Since its inception, the field of second language acquisition (SLA) has been both theory-less and theory-laden. It has been theory-less in that, as most major textbooks remind us, there has yet to emerge a single, coherent theory that can describe, explain, and predict second language learning. Yet it is theory-laden in that there are at least forty claims, arguments, theories, and perspectives that attempt to describe and explain the learning process and predict its outcomes (see Larsen-Freeman & Long 1992: 227). It is within this context that an interactionist perspective on language learning has thrived. As a perspective on language learning, it holds none of the predictive weight of an individual theory. Instead, it lends its own weight to any number of theories.

In an article in one of our foundational journals, *Interlanguage Studies Bulletin*, Vivian Cook showed how an interactionist perspective could be applied to the three major theories of the time: Krashen's Monitor Theory, Schumann's Acculturation Theory, and Hatch's Conversational Theory (see Cook 1978). In that article, Cook discussed the ways in which each theory attributes the contributions of the learner and the learner's linguistic environment to the learning process. He also reminded us of an already established interactionist tradition in the field of child language learning in which, for example, even the differing theories of Vygotsky and Piaget could also be viewed as interactionist within each perspective.

Over the years, the interactionist perspective has found its strongest identity through a line of research referred to in this paper and elsewhere, as "language learning through interaction." The emphasis in this work has been on the social aspects of interaction, with interaction viewed as the context and process through which language can be learned. Evelyn Hatch, in what most researchers might consider the seminal work in this area, showed us how it is through social interaction with their interlocutors that learners can process an L2 message as input for learning (see Hatch 1978). Long (1983 et passim) added that this input was made particularly comprehensible and processible during a type of interaction known as negotia-

tion. This interaction occurred when the flow of learner's interaction with interlocutors was restructured and modified by requests and responses regarding message comprehensibility.

The cognitive dimensions of the learning process have generally been acknowledged in work on "language learning through interaction," but their role and contributions to L2 learning have been implicit. This is largely due to the fact that process constructs such as "creative construction," "hypothesis testing," indeed, the construct "acquisition," though widely used throughout SLA literature, were not sufficiently described or operationalized for empirical scrutiny.

Over the years, we have come to know much more about SLA. Some of the very factors that were deemed intrusive to the learning process, such as the learner's attention or the learner's use of time, are now seen as crucial to certain aspects of the process. Thus, through the work of Hulstijn (1994) and Schmidt (Schmidt & Frota 1986; Schmidt 1990, 1994), we see that attention matters, and it matters a great deal to the learning process. We see that the dimension of time is a factor in L2 learning, in the immediate term, as well as in the long haul. Studies as different as those of Crookes (1989) and Robinson (1995) on the relationship between planning time and production, by Kelch (1985) on the role of speech rate and input processing, and by Lightbown, Spada, White, and colleagues (see, for example, Lightbown & Spada 1990; White 1991; White, Spada, Lightbown, & Ranta 1992) on retention of learning over time, have certainly brought this fact to light. Of course, there has been more research, more thinking and theorizing, more sharing of findings and ideas in books, journals, and conferences devoted to SLA as a field in its own right. All of this has been of great interest and assistance to work on interaction and has contributed enormously to the field of SLA. What it has done is to open up a number of new perspectives through which the theme of "language learning through interaction" might be viewed.

This article, therefore, will discuss ways in which "language learning through interaction" can be viewed within several of these perspectives that are now available. As such, "language learning through interaction" might be viewed as the interaction of several learner needs—the need to understand an L2 and to express it across modality with accuracy and appropriateness. This article will also discuss "language learning through interaction" as the interaction of learning processes. As such, this would include both the interaction among the cognitive, psycholinguistic, and social processes of language learning as well as the interaction of various processes within them. Finally, this article will describe "language learning through interaction" as the interaction of the learner with native-speaking interlocutors as well as with other learners, both in general and in more specific terms.

Learner's Needs

Current theoretical literature and research on SLA reflects quite a few learner needs with respect to what learners need to be able to do in an L2 and what they need in order to be able to accomplish this. The field has moved beyond the point where comprehensible input is seen as sufficient for L2 learning. So, what do learners need to be able to do? As noted above, they need to understand a language and to express it across modality, with accuracy, and appropriateness, in context. Second, they need to access grammatical categories represented through constructs, such as noun or verb, and to access grammatical functions, such as subject and object. To do all of this, and probably much more, learners need more than comprehensible input. They need, for want of a better term, data — data on L2 form and its relationship to function and meaning. Some of the data is readily available or transparent to learners in messages whose meaning they can understand, so learners still do need to comprehend input.

Yet there are also L2 forms whose relationship with meaning is difficult to access in the L2. These forms may carry little semantic weight or have little perceptual salience, or the form-meaning relationship may be difficult to grasp. Thus, for example, learners are often able to infer the relationship between the English plural *-s* morpheme and its function in context, but they struggle with the English article *a* in all its functional complexity (see Pica 1983 and Harley 1993). Learners also need data as they construct or set their interlanguage. They need to know how their interlanguage differs from the L2. It might be said that they need to know what is ungrammatical, but since interlanguage is systematic and, therefore, grammatical in its own way, one might simply say that learners need to know what in their interlanguage is inconsistent with the L2. Finally, learners need to have data on the potential of their interlanguage for expressing relationships of form and meaning as well as the extent to which they can modify and restructure their interlanguage toward L2 morphosyntax.

The question remains, how learners can meet their data needs. A number of learning processes have been identified. Interestingly for the field of SLA, the factor of attention in L2 learning, previously viewed as controversial at best, and often discounted, has come to be seen as fundamental. As reflected in current literature, attention involves the interaction between two aspects of language learning: the learner's attention to L2 form and meaning as well as attention to the L2 learning experience itself. With respect to the learner's attention, a number of constructs are prominent within the field. These include: consciousness raising (Rutherford & Sharwood Smith 1985), noticing (Gass 1988; Schmidt 1990, 1994), and focus on form (Doughty 1991; Long 1991b, 1995). With respect to the L2 learning experience itself, processes include: awareness of a need to learn (Gass & Selinker 1994) and motivation (Crookes & Schmidt 1991). The latter is seen increas-

ingly in both its cognitive and social dimensions, as exhibited through attention, persistence, and active involvement in learning activities.

A number of additional processes follow from attention. As reflected in the discussion below, some have been operationalized with greater details than others. Some have been subjected to a considerable amount of research, and some appear to be more relevant to the learner's data needs than others are. These processes and their contributions to L2 learning first include comprehension of meaning. This process has long been viewed as a required *condition* for L2 learning (Long 1983, 1985; Krashen 1981, 1983), which functions to free the learner's attention to focus on form (Krashen 1981, 1983). However, a number of research findings contest this perspective on comprehension. Work by van Patten (1983), for example, has shown that simultaneous attention to form and meaning is difficult. Furthermore, recent research has revealed how comprehension actually draws the learner's attention to focus on form, as learners attempt to comprehend the meaning of messages encoded with: relative clauses (Doughty 1991), locatives (Loschky 1994), and pre/post modifiers (Pica 1994).

Another process of note, but one about which less is known, is the learner's analysis of all this data into units of the L2 with reordering and rearrangement as actual L2 constituents (Klein 1986). This is constrained by complexity of processing required for the L2 to serve as data for stage development (Meisel, Clashes, & Pienemann 1981; Pienemann 1989). Yet another process is the learners' comparison of their interlanguage with the second language. This process facilitates "noticing the gap" between L2 input and interlanguage production (Schmidt & Frota 1986). It also facilitates the learner's awareness of rule application and misapplication (Tomassello & Herron 1988, 1989). It is believed to be especially helpful in giving learners access to difficult data as well as access to their own interlanguage as data for learning.

Additional processes that lean toward the production and access needs of learners include their planning and production of meaningful messages. Message planning has been shown to draw attention to preciseness of form needed for message meaning for articles (Crookes 1989) and for the past regular (Ellis 1987) and is very much driven by topic familiarity and context. What this has shown is that the less familiar context available to the learner's interaction, the more the learner must aim toward accurate and often complex coding of the message. In short, the less of context there is, the more linguistic coding is required (Chaudron & Parker 1990; Robinson 1995). This is also why, as will be discussed below, as input is made comprehensible to learners, and as learners attempt to modify their own output toward comprehensibility, L2 coding becomes more elaborated, not simplified as was previously thought.

Another process is message production. This draws the learner's attention to the clarity and complexity of form needed for message meaning during production of modified output (Linnell 1995; Pica et al. 1989, 1991;

Pica 1994, in press; Pica et al. 1995; Swain & Lapkin 1994). Other processes include the internalization, storage, restructuring, and retrieval of interlanguage. Compared to other processes involved in L2 learning, less is known about how these function. However, there is considerable agreement that L2 learning is largely a long-term process; thus, any change that occurs in the learner's interlanguage in a given moment of social interlanguage is often not sustained over time (see Carroll & Swain 1993; Harley 1989; White 1991).

Social Processes of L2 Learning

A great deal has been written about the social processes of L2 learning. These include interaction modified by negotiation and its close cousin, collaborative dialogue, as well as instructional intervention, instructional discourse, and garden path interaction, which itself is a variant on instructional interaction.

Negotiation

Interaction modified by negotiation, or negotiation for meaning, as it is often called, has been described in the SLA literature on many occasions. Contributions from some of the many researchers who have contributed studies in this area are found in the edited volume by Day (1986). Additional research is found in Doughty (1991); Gass & Varonis (1985a, 1986, 1989, 1994); Hatch (1978); Holliday (1991); Linnell (1995); Long (1980, 1983, 1995); Mackey (1995); Oliver (1995); Pica (1992, 1994); Pica et al. (1989, 1991, 1995); Varonis & Gass (1985a, b). Interaction modified by negotiation consists of messages about comprehensibility — audibility, accuracy, relevance, as well as lexical and phrasal meanings. Negotiation can occur through open questions or modifications of previous utterances (e.g. repetition, extraction, or segmentation); these appear in italics in the excerpts shown throughout this article. Another part of negotiation are responses to signals. These are generally encoded with the same types of modifications as signals are — repetition, extraction, segmentation, and other modifications of previous utterances, as well as forms of *yes* and *no*. Responses are shown in bold in the excerpts.

Research has revealed a number of important contributions of negotiation to L2 learning. First, negotiation assists comprehension. The signals and responses of negotiation make message meaning comprehensible to participating learners (see Pica, Young, & Doughty 1987; Doughty 1991), and to learners who simply observe others negotiate (Pica 1991; Mackey 1995). As seen from excerpts 1-3, negotiation also brings salience to form-meaning relationships and in this way, also addresses the analytical process of segmenting message data into L2 units. Thus, for example, research by Pica (1994) found that 18% of native speaker and 12% of learner signal utterances as well as 24% of native speaker and 21% of learner response utterances were modified for both lexis and structure. Supportive results

were also shown in Doughty (1991) and Mackey (1995). Note that in excerpt 1, the NS responds to the learner's signal both by defining *chimney* and by moving it from object of the preposition *with* to subject of the response utterance *chimney is where the smoke comes out of*. This contribution of negotiation is also shown in the more extended negotiation of excerpt 2, in which the NS shows the learner the sound and meaning differences between *fire* and *fall*, the structural possibilities of the phrasal verb *fall over* and the particle verb *knock over*.

Excerpt 1:

Hiro:

what is chimney?

(Pica 1993)

Jack:

ok with a big chimney
chimney is where the smoke
comes out of

Excerpt 2:

Seiji:

*...and er fire
fire each other*

fall fall

fall

*fall each other ok
fall is a held each other held?*

sorry

fall down

fall

fall down each other

(Pica et al. 1996)

Paul:

yeah
and no- fire- no-
fall over each other
fall over each other
you know what I mean?
they knock each other -
yeah

yeah yeah they fall over each
other they knock each other
over they-
they're knocked down
but that- but the fire knocks
them down er- they fall down
yeah over each other or
something
yes
yeah

The NS's responses to the learner also display differences in transitivity between *fall over* and *knock over*, although, as noted earlier, this sort of momentary input was to have no apparent impact on the learner's production. In fact, the NS seems to make the impact a little worse by responding only to the meaning of the learner's message rather than to its form. Toward the end of the excerpt, Seichi asks Paul about *fall down each other* and Paul says, *yeah—yes* for meaning, but not *yes* for form. Unfortunately, there is really nothing inherent in this negotiation that could have informed Seichi of this distinction.

As seen in excerpt 3, even learners can assist each other through negotiation in ways that are as effective as, and, in some instances, surpass the NS as an interlocutor but which, in other ways, are much less effective. This situation will be described below. For now, however, what should be noted is that in response to a signal from Taro about *two stairs*, Ichi brought out the semantic and morphosyntactic relationships among *step*, *steps*, and *stairs*. This provided informative data about the L2, though not in the standard variety of English to which Taro presumably wants access.

Excerpt 3:

Taro	Ichi
	...and the door is located in the center of the house and has two stairs
<i>has two stairs</i>	ah I mean two steps of stairs actually one stair
oh I got it	

(Pica, et al. 1996)

Negotiation also provides learners with feedback, most notably, according to Long, on vocabulary, morphology, L2-specific syntax, and L1-L2 contrasts (see Long, in press). Using Long's framework (1995), as it builds on Pinker (1989), we can say that negotiation signals provide feedback that is made usable and useful. This is accomplished in several ways, including target-like models, recasts, and reduced repetitions. Target-like models of learner utterances facilitate the learner's production of modified output, at least in the short run. This can be seen in excerpts 4-7.

Excerpt 4:

Kata	Allan
he forgot to switch on	<i>to switch off</i>
he forgot to switch off	right
and so make fire	<i>and it made a fire</i>
yeah, yeah	

(Pica, et al. 1996)

Excerpt 5:

Kato	Mack
...gasgon	<i>a what? say that again</i>
gasgon gasgon	<i>the gas</i>
the gas	<i>on the stove</i>
stove er the stove	

(Pica, et al. 1996)

Excerpt 6:

Seiji

she turn on er gas stove

she she er then phone phone is ringing

yes she heard heard phone ringing ok

(Pica, et al. 1996)

Paul

she turns the gas on to the stove
or something like that

yeah the gas to the stove

*ah ah then she she heard the
phone ringing*

Excerpt 7:

Taro

its wall is complete white

yeah completely white

yeah completely white

it looks not wood

it looks concrete

(Pica, et al. 1996)

Ichi

completely white?

In Excerpt 4, for example, Kata was able to correct her *switch on* to *switch of*. In Excerpt 5, Kato's *gasgon* became *the gas*, with help from Mack. In Excerpt 6, Seiji switched to the past tense following Paul's signal, and in 7, Taro was able to modify *complete white* to *completely white*, based on Ichi's negotiation signal (Gass & Varonis 1994; Pica et al. 1995; Linnell 1995).

Negotiation also supplies feedback through recasts. These are immediate responses that reformulate, expand, and are semantically contingent to incorrect learner utterances. They seem to work most effectively if there is one learner error per recast. In negotiation, recasts appear primarily in signals to learner utterances, but they also occur in other utterance types in other forms of discourse. This fact was recently seen in the recent dissertation research by Oliver (1995) at Western Australia (see also Long, in press; Mackey 1995; Philip & Mackey 1995). Excerpt 8 shows a good example of a recast. Kata tells Allan *I don't have a telephones picture* and Allan signals with *you don't have a picture of a telephone?*

Excerpt 8:

Kata

forring?

yeah...I don't have a telephones picture

yes, I have another picture...

(Pica, et al. 1996)

Allan

and right next to her a phone
rings?

a phone? telephone? is there a
telephone next to her?

*you don't have a picture of a
telephone?*

Other feedback can take the form of reduced repetitions of learner error, with emphasis on the error itself (Chaudron 1977). This can be seen again in Excerpts 4, 6, and 7. These forms of feedback can also be found in discourse outside of negotiation. In spite of helpful data on L2 and interlanguage that can come through negotiation, it is important to point out — as is evident from the excerpts — that there is really nothing explicit in a negotiation signal that tells learners whether the signal is about code, meaning, grammatical accuracy, or social appropriateness. This is why the data that negotiation provides for L2 learning may not be sufficient to meet learners' needs. This is also why other kinds of intervention may be required, especially for the kinds of inaccessible data noted above.

In addition to addressing learners' needs for input and feedback, negotiation provides a context for their production of modified output, particularly when signals are clarification requests and open questions rather than confirmation checks or segments (see Pica et al. 1989, 1991, 1995; Linnell 1995). This can be seen throughout the excerpts, but especially in excerpts 9-13 where signals such as *you have what?* in 9, *sorry?* in 10, *what* in 11 and 13, and *I am confused I don't get it* in 12, draw forth learner responses of lexical as well as morphosyntactic modification to their messages.

Excerpt 9:

Kata
round the house we have glass
uh grass, plants and grass

Allan
you have what?

(Pica 1992a)

Excerpt 10:

Learner
there's a three — tree
yes a tree on the right a small tree
sorry?

Learner
a tree?
a very little tree?
it's a little little tree? it's a big
tree?
yeah ok

a little not little little but little

(Assis 1995: 29)

Excerpt 11:

Taro
what?

Ichi
ah where is one door?
where is the door?

(Pica, et al. 1996)

Negotiation has also been shown to bring about morphosyntactic complexity of NS input (Pica, Young, & Doughty 1987) and learner output (Pica et al. 1989; Linnell 1995). This latter area can also be a site for message

modification toward syntacticization. Here, learners respond to the signals by modifying messages that had been organized pragmatically, (according to the guidelines of Givon 1979, 1985; Meisel 1987; Linnell 1995), through topic-comment structures, juxtaposition of elements, minimal morphosyntax, and with dependence for comprehensibility on shared situational context. The learners in excerpts 12 and 13 show some evidence of syntacticization in their responses, through their manipulation of the syntax of their initial utterances, with incorporation of additional, contextual information through noun referents, indirect objects, and sentence connectors.

Excerpt 12:

Learner
 they not find the dragon in the cave
 they find not the dragon in the cave
 the dragon hide in the cave and the
 knights find not it

NS Researcher
I am confused, I don't get it
I am confused. I don't get it
 ok

(Linnell 1995: 266)

Excerpt 13:

Learner
 he said that 'we are ridding the sleigh
 his friend told the bird to we are rodeing

NS Researcher
what?

(Linnell 1995: 269)

In spite of the evidence that negotiation serves as a social process that interacts with cognitive and psycholinguistic processes of L2 learning, and that addresses interlanguage change, learners have been observed to negotiate more frequently over lexis than over morphosyntax. For example, learners and interlocutors give more attention to the physical features and attributes of the people and objects in their discourse than to the time and activities in which they engage (see Pica 1994; Pica et al. 1995). Although negotiation has been observed over grammatical morphology, this has not been shown in impressive amounts (Pica 1994). In light of these production-related contributions of negotiation, and the input feedback contributions discussed above, it would appear that as a social process, we see that negotiation for meaning can contribute to L2 learning, but that additional contributions are needed to support the psycholinguistic process of L2 learning.

Collaborative dialogue

Another social process of L2 learning is collaborative dialogue. As Swain, Ellis, and Lantolf have shown, collaboration can occur without the kinds of communication breakdowns and repairs that characterize negotiation (see Ellis 1985; Swain 1994; Alijaafreh & Lantolf 1994). Thus, collaboration

provides a basis for scaffolding, completion, and production of modified output (Ellis 1985), particularly in learner-to-learner interaction (Pica et al. 1995; Swain 1994). These processes are illustrated in excerpt 14, in which Mitsuo assisted Katamachi with a form of *boil* that was needed to complete his utterance.

Excerpt 14:

Katamachi	Mitsuo
hm-mm boiled the water my picture is...	<i>boilding?</i>
boilding boild boilding	
I don't know how to do	
I mean there is a water in the cup. how do	
you make a sentence there is a cup...	there's a cup of water
cup of water? then	then cup of water

(Pica, et al. 1996)

Collaborative discourse appears to have much to offer language learners. As yet unknown, however, is whether these features may also be subject to the same signal-response constraints as are found in research on negotiation. Further research on this social process of L2 learning is clearly needed.

Instruction

A more direct way for learners to obtain difficult-to-access data is through instructional intervention, often of a structured and explicit nature. Research has begun to show that meaningful classroom interaction through content-based instruction, while important to L2 learning success, may not always provide a sufficient source of data to meet the learner's needs. Studies of French immersion programs in Canada have identified a good deal of success among students in L1 retention and maintenance. In addition, their level of L2 achievement has been found to be superior to that found in more traditional, foreign language classrooms (see, e.g., Genesee 1987, Snow 1991 for reviews). These, and other studies, however, also report incomplete L2 learning amidst this success — with better comprehension than production, and with linguistic accuracy lower than communicative fluency, as well as inaccuracy with complex clause structures, verb tense and aspect forms and sociolinguistic rules (Lightbown & Spada 1990: White 1991: White, Spada, Lightbown & Ranta 1991). These findings suggest that despite the success of immersion programs with respect to L1 retention and overall achievement, learners may need more than content based instruction can offer them.

One possibility for addressing this need would be instructional intervention that would give learners an opportunity to access L2 data that goes beyond the communication of meaning. As currently operationalized, such instructional intervention includes: metalinguistic information, highlighting of form, and /or corrective feedback.(Lightbown & Spada 1992) and

other forms of enhanced input (Sharwood Smith 1991) designed to focus attention to form in context of communication (Lightbown 1992). A number of studies have shown that these instructed features facilitated learning for: *-ing* and adjective-noun order (Lightbown & Spada 1990); adverb placement (White 1991); dative alternation (Carroll & Swain 1993); conditional (Day & Shapson 1991); questions (White, Spada, Lightbown & Ranta 1990); *passé composé* vs. *imparfait* (Harley 1989); and overall grammar (Montgomery & Eisenstein 1986; Spada 1987). In many cases, learners retained the instructed item after their instructional period was over.

Studies that focused on specific features of instruction have revealed significant results in several areas. Thus, research has shown that instruction to attend to form facilitated learning of word order (Hulstijn & Hulstijn 1984) and overall grammar (Spada 1987) for L2 learners. It has also been found that message encoding in L2 forms and structures for which the learner was developmentally ready facilitated the learning of word order and constituent movement (Ellis 1989, Pienemann 1984, 1988); as well as question formation (Mackey 1995). Furthermore, message encoding in L2 structures marked hierarchically, in this case through the relative clause accessibility hierarchy, facilitated the learning and generalizability of relative clauses formation throughout the hierarchy (Doughty 1991; Eckman et al. 1988; Gass 1982). So instruction is making a difference, as Long told us that it would, and instructional interaction is what seems to be quite effective in these cases.

A variation on instructional intervention is garden path interaction, in which learners are given instruction on the rules for production of a regular form which misleads them to overgeneralize the rule to a context where they should use an irregular form. For example, learners might say *drinked* after having been instructed on the *past regular*. This error would provide a basis for the teacher to introduce learners to the *past irregular*. Garden path interaction appears to help learners make cognitive comparisons between their interlanguage and the L2 and to heighten their awareness of rules, regularities, and exceptions that may be difficult to access. In their research, Tomassello and Herron (1988, 1989) have shown that learners who are led down the garden path to first misgeneralize the rules for regular forms and who then are taught exceptions were better able to internalize these irregular forms than those learners who were taught the rules and patterns at the same time.

As was evident throughout the excerpts above, both NS and learner interlocutors can contribute to the cognitive and social processes of L2 learning, and thereby supply data for L2 learning. Their common, as well as unique, contributions are as follows: First, learners are given more modified L2 data from native speakers than from other learners. Thus, in Pica et al. (1989), Pica (1992, 1994), and Pica et al. (1995), it was found that, when engaged in communication tasks, NSs responded to learner signals about utterances that were difficult to understand by modifying those initial ut-

terances 73 percent of the time. Learners, on the other hand, responded to NS signals with only 54 percent modification. This pattern also held for learner responses to other learners, with 51 percent modification observed in learner to learner discourse. NSs seem to modify their prior utterances in response to learner signals in this way regardless of signal type. However, learners modify prior utterances mainly in response to signals that are open questions or clarification requests. This signal-response pattern was revealed in excerpts 1 and 2. In these sections, NSs modified their initial utterances regardless of learner signal. This pattern is quite different from that revealed in excerpts 15-18. Here, the use of modification in the learner's response appeared to be a function of whether or not the signal was a clarification request or an open question, (see Pica et al. 1989, Pica 1994, Pica et al. 1995). Thus, in excerpt 15 the signal *what?* drew a modified response from the learner. The same modification occurred with Sato's signal *light? what? excuse me?* to Shiro in excerpt 16.

Excerpt 15

Learner
 they are think about the fun thing so they
 are change the position each other
 they change up the position so they
 think father went to a preschool and son
 went to the company OK

NS Researcher

what?

(Linnell 1995: 269)

Excerpt 16

Shiro
 and one picture another picture is two
 one woman one man sitting on the sofa
 and the man light his cigarette
 another picture is sitting on sofa and are
 sitting on sofa and the man light on his
 cigarette

Sato

light? what? excuse me?

(Linnell 1995: 269)

This was different from the interaction found in excerpt 17. Here, Mike's modified signals of *on the front?* and *in the front of the door? there is a small step, yes.* drew forth only a variant of *yes* from Masa. In excerpt 18, Katamachi's signal, *she has match?* drew forth only *yes?* from Mitsuo.

Excerpt 17

Masa
 I think on the front is a small stone
 yeah oh doors
 yeah
 oh yes

Mike
on the front?
in the front of the door?
there is a small step, yes.

(Pica, et al. 1996)

Excerpt 18

Katamachi

she has match?

my picture has a - she is try to turn s—
how do you say on the gas

Mitsuo

my picture she has match

yes

(Pica, et al. 1996)

Comparing excerpts 1 and 2, with 19 and 20 illustrates how learners are given more directed and diversified L2 data from NSs than from other learners. As shown in excerpts 1 and 2, NS modifications in responses to learner signals are tied to learner signals through segmentation, relocation, and definition of previous utterances about which the learner has signaled. However, as seen in 19 and 20, learner modifications in response to signals are often repetitions of their prior utterances or add new information, relevant to what is being talked about but not directly linked to the signal. Thus, in excerpt 19, Kata supplied information about the *simple* appearance of his house even though Mitsuo's signal about the house was more concerned with its size. In 20, Kata elaborated about the *way* of his house, even though Mitsuo's signal was about the *door and windows* of the house.

Excerpt 19

Kata

and in the right side of the tree
I have a house a big house

my house have it's a big but er simple

Mitsuo

right side
a big house?

Ok

(Pica, et al. 1996)

Excerpt 20

Kata

I have a door and two windows like
a house that everyone draws and
with a way

a door and two windows and a way
I have a door and a way for people
who can pass

Mitsuo

there is a door
and two windows?

(Pica, et al. 1996)

As these excerpts also illustrate, learners are given more diversified L2 data from NSs than from other learners. This probably occurs because the learners have fewer linguistic resources for modification than do the NSs, both in their production of modified output and as providers of modified

input. Although this capacity of the NSs makes them strong providers of input and feedback, it may also limit the learner's communicative needs, as all of the repetitions, segmentations, expansions, and recasts that native speakers make of learner utterances tend to block learner production of output. This is not surprising given that once learners hear a native model, they have nothing else to say in their responses but *yes, that's what I meant to say?* (Oliver 1995, Pica et al. 1989, Pica 1994, Pica et al. 1995), unless, of course, they had been trying to say something else, in which case they might modify their output. The question then remains: what data are learners good at providing?

In general, during negotiation, the modification that learners make in response to learner signals provide two types of data. For the responding learner, there is interlanguage data on that learner's own potential to manipulate and modify current interlanguage, and for the signaling learner, there is input data to serve the other's interlanguage construction and L2 learning. Both of these data can be seen in excerpt 3. This a clear example of the learner's attempt to modify output lexically and morphosyntactically. In so doing, however, Ichi may have provided a context for his own coordination of modified output; however, he did not supply the best model of L2 input for the other learner. Another contribution of learners as interlocutors is found among learner signals to each other. Those signals that are segmentations of prior utterances are generally quite consistent with standard L2 grammar. This can be seen above in excerpts 3, 7, 10 and here in 19 and 20. This is good news, as segmentation constitutes the major signal type among the learners thus far in our research. (see Pica 1992, 1994).

Finally, as had been shown in excerpt 14, and as illustrated in excerpt 21 as well, learners are effective in working together through scaffolding and completion to supply each other with words and phrases needed for message meaning. NSs do this too, but they often complete learner messages with a target version or model of what the learner has already said rather than supply new or missing words for them. This can be seen in excerpt 21. Here, Paul recasted Seiji's *she forget she with about the stove* but this as the more appropriate *she forgets about the stove*.

Excerpt 21

Seiji
and er she she talked er on the phone
long time
she she forget er about the the stove

she forget she
yes

Paul

oh
*ah she talks er erm
after that she forgets
about the stove*

(Pica, et al. 1996)

The comparison of NSs and learners as resources for L2 learning is not a new direction in the study of language learning through interaction. Earlier incarnations include studies on group work vs. teacher-fronted interaction (Pica & Doughty 1985a, b; Doughty & Pica 1986), and negotiation among learners vs. between native speakers and learners (Gass & Varonis 1985b, 1986). However, these studies were conducted within the theoretical contexts of their time, at a time when researchers counted instances of negotiation and drew inferences about language learning from them. More is now known about learners' needs to access the different kinds of data that assist L2 acquisition, and the need to engage in the cognitive and social processes that offer access to such data.

As researchers take account of the multiple kinds of data needed for different aspects of the learning process and of the different psycholinguistic and social processes involved in accessing these data, they are generating an increasing number of studies that relate to the interaction among these processes. A great deal of new research has emerged on "language learning through interaction" with respect to the different cognitive, psycholinguistic, and social processes described in this article. It is well-conceived, well designed research, with considerable application to the classroom.

Researchers are looking at relationships between types of interaction and learner productions therein. They are looking at feedback, other kinds of input to learners, and the impact these have on learners' responses in the short and long term. Throughout, references have been made to some of the young researchers who are conducting work on language learning through interaction, in one or all of the ways I have noted in this article. Among the new names on the research horizon are Julian Linnell for his recent work on interaction and interlanguage syntacticization (Linnell 1995). Also noted are Rhoda Oliver (1995) for her study of children's interaction, the impact of interaction on the availability of feedback, and the effect this feedback had on their production of modified output (Oliver 1995); Alison Mackey for her work on the impact of negotiation on accelerating learners through developmental stages of L2 learning (Mackey 1995); and Anna Assis, and Peter Robinson for their studies on communication tasks and language learning (Assis 1995; Robinson 1995).

These and other junior researchers, along with those who are already highly established, are ushering a new phase of research on language learning through interaction. It is a time when leading researchers such as Gass, Long, Lightbown, and Swain are forging new lines of research on the relationship between feedback and language learning (see Long in press, Lightbown 1994; Swain 1994). Swain has also subjected her own construct of comprehensible output to research on collaborative discourse. (see Swain 1994), and Lightbown has directed a series of experimental studies on classroom interaction and SLA, with collaborators Spada, White, and Ranta (see White, Spada, Lightbown, & Ranta 1991). The point to be made in closing

is that the field of SLA has come a long way from looking at interaction and L2 learning from the perspective of social interaction alone. Now that many of the more cognitive constructs of L2 learning have been operationalized, they too can be studied within an interactionist perspective and implemented with these social dimensions.

What this all means is that researchers no longer simply study features of social interaction but examine the interactions among these features, as they question how they affect the learning needs and processes of language learners. If there were a time in the past when this line of research seemed to be at standstill, simply counting instances of interaction (see Ellis 1991), that time has passed. With new, operationalized variables and multiple perspectives for examining them, there is much work to be done.

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