# SLA in the Instructional Environment

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This state-of- the- art article reviews research on the role of instruction in SLA and the types of research that have been carried out, from experiments and classroom observation to task-based research and meta-analyses. The author examines the constructs and theories that this research has supported and concludes that more long-term classroom studies are needed.

## Introduction

The label, "instructional," applied to "environment" suggests a setting in which a content area or skill is organized, presented, and explained to the learner. The second language (L2) instructional environment is unique in that it can offer the L2 as the content or skill that is instructed as well as the medium through which the instruction is offered. Through the instructional environment, learners can access samples of L2 text and discourse. These can serve as evidence or information that learners can apply to their developing interlanguage system and use to modify and reconfigure its linguistic and communicative features. Understanding, describing, and predicting what makes the L2 accessible and the learner successful are central to the numerous studies that bear the label, "instructional." These include studies carried out in classroom settings as well as in controlled environments in which the label, "instructional" characterizes the treatments or conditions that make the L2 available for learning. Findings from these studies have informed the broader field of Second Language Acquisition (SLA) at empirical and theoretical levels.

Research on the instructional environment has embraced dozens of questions, topics, and themes, some of which are described in this article. The instructional environment itself has been analyzed, in descriptions of instructional moves, interaction structures, and participation patterns, and through comparisons of experienced and novice instructors, form and meaning based approaches, and input oriented and production driven methods (See Chaudron, 1988 and Lightbown & Spada, 2006 for overviews). In attempting to link these components with SLA, researchers have gone beyond describing the complexity, markedness, and other features of instructional discourse, to discovering the

interaction structures that draw attention to L2 form and meaning and make the L2 available as input for learning (e.g., Doughty & Williams, 1998). Features of rule provision and corrective feedback are no longer viewed as limited to the formation of conscious L2 knowledge. They have taken on greater theoretical importance as vital contributors to cognitive processes and learning outcomes (e.g., DeKeyser, 2003; R. Ellis, 2005).

Methodological issues reveal one of the many ways in which concerns about SLA in the instructional environment resonate across the broader field of SLA. Questions on the contributions of input, interaction, production, and correction are relevant to all SLA environments and remain at the forefront of SLA theory and research. The relationship of explicit to implicit features, whether about learning, instruction, or knowledge, continue to perplex and fascinate scholars throughout the field. This article will therefore look at research on SLA in the instructional environment as it bears on broader theoretical concerns of the field at large and contributes to its methodological needs.

The article first highlights research from the instructional environment that has introduced theoretical constructs to SLA and tested their claims about input, interaction, feedback, and output processes. It then describes ways in which task-based activities that originated in the instructional environment have contributed to this research and proposes strategies through which they might do likewise for outcomes oriented projects. The article ends with a brief discussion of the ways in which the classroom can serve as an environment where instruction and research can thrive, by providing an optimal context for the implementation of task-based activities and by offering time as a commodity greatly needed to address current questions on SLA.

## Historical Perspectives and Methodological Concerns

Languages, like all other objects of learning, are acquired in contexts. Among the contexts available to language learners, the instructional environment is one that has been a source of curiosity and debate in the field of SLA since the early 1970's. Long before that, second languages were instructed (e.g., Howatt, 1984; Kelly, 1969) and their acquisition was researched (e.g., Leopold, 1939-1949; see also Hatch, 1980 for a detailed overview). However, during the seventies, the instructional environment began to take on theoretical significance, as advances in psycholinguistics provoked questions and concerns about its role in SLA. Since the mind appeared capable of amassing, sorting, and synthesizing intricate grammatical operations and complex cultural rules, and of handling whatever ambient linguistic data it encountered, what was left for an instructional environment to offer the L2 learner?

Initially, it appeared as though the instructional environment had little to offer the learner. The features of rule provision and error feedback that made the instructional environment distinctive (Krashen & Seliger, 1975) were believed to help build conscious knowledge of L2 forms and grammatical structures. What the learner needed, however, was to acquire a systematic interlanguage grammar that could be restructured unconsciously and accessed readily for spontaneous, unmonitored use. SLA was seen as a process of creative construction (Dulay, Burt, & Krashen, 1982) that resembled first language acquisition. It required an environment composed of meaningful input, made comprehensible through the familiarity of its topics, the visual cues that accompanied it, and the interaction that provided support. Such features were potentially available in the instructional environment, but they could also be found in everyday settings, through informal L2 contact, as well as in classrooms not designed for language study but abundant with opportunities for language use (Krashen, 1976).

These reservations about the contributions of the instructional environment began to shift in the eighties, when Michael H. Long published a meta-analytical comparison of studies whose data on SLA had come from instructional, exposure, and combined environments (Long, 1983). Findings from these studies pointed to a superiority for the instructional environment, particularly in the acquisition rate and level of attainment of instructed learners. Although the meta-analysis was not able to pinpoint the factors responsible for this result, Long raised the possibility that the discourse of the instructional environment, particularly its linguistic complexity and markedness, might have played a role.

Since the time of Long's meta-analysis, research on SLA in the instructional environment has burgeoned in size and scope. An update of Long's original meta-analysis by John Norris and Lourdes Ortega (2001) has lent further insight and raised additional issues regarding the instructional environment and SLA. Through a comparison of fifty-one studies whose data came from four distinct types of instructional environments, Norris and Ortega found that explicit, form-focused instructional environments resulted in more accurate and advanced SLA outcomes than those that followed implicit approaches. Appearing at a time of considerable evidence and convincing argument that implicit L2 knowledge is the basis for communicative L2 use, (N. Ellis, 2003), the findings of the meta-analysis have suggested the need to consider how explicit learning might contribute to the implicit knowledge that learners eventually come to use (e.g., DeKeyser, 2003).

These findings have also posed methodological challenges to SLA research. This is because so many of the analyzed studies obtained their results through short-term treatments, and documented learning through discrete point tests. These methodological approaches are known to favor the learner's demonstration of explicit over implicit knowledge. Implicit knowledge takes a long time to acquire and its acquisition is not always obvious on isolated test items. The findings of

the meta-analysis thus underscore the need for long-term treatments and for measures and tests more sensitive to the acquisition of implicit L2 knowledge and the demonstration of its outcomes (Norris & Ortega, 2003, 2006; See also Doughty, 2003).

Methodological concerns have also been raised about the use of intact classrooms versus the use of instruction in more controlled settings (DeKeyser, 2003; Doughty, 2003). The instructional environment has served as a source of SLA data beginning with early studies that compared the morpheme accuracy order of learners from different instructional backgrounds (Dulay & Burt, 1974; Pica, 1983) and has remained so to date. Initially, there was a need for descriptive data on L2 classrooms. Studies uncovered similarities and differences between teacher-fronted and student group interaction (Pica & Doughty, 1985a, b); communicative and grammar focused activities (Long & Sato, 1983); and high and low levels of student turn taking and participation (Allwright, 1980). Over the years, the instructional environment has taken on a much broader role in the field of SLA, contributing research that has informed SLA theory about "noticing the gap," (Schmidt & Frota, 1986), "focus on form," (Long, 1991), and "modified, comprehensible output," (Swain, 1985), and validated theoretical claims about the role of negative evidence (L. White, 1991), the importance of recasts in meaning focused contexts (Doughty & Varela, 1998), and language "teachability" (Pienemann, 1989).

Much of the research has been carried out in intact classrooms, but a good deal has also been conducted in controlled environments in which the label "instructional" characterized the treatments or the conditions under study rather than the setting of the study. Concerns have been noted about the "ecological validity" of this approach to research, as it has required the isolation and comparison of instruction-related variables and treatments (DeKeyser, 2003; Doughty, 2003). As will be revealed throughout this section, however, findings from this research have demonstrated a good deal of external validity to instructional and informal environments alike. In addition, results of a recent study that compared task based interaction in classrooms and laboratory conditions suggest that setting type might not be as critical as other instructional dimensions in addressing questions on the instructional environment (Gass, Mackey, & Ross-Feldman, 2005). The study found striking similarities in learner behavior across the two settings. Differences appeared to be a function of the types of tasks in which the learners engaged rather than the settings in which they worked.

Methodologically, the isolation and comparison of instruction-related variables and treatments has been an important and necessary step toward understanding their role in the SLA process and their contributions to successful L2 outcomes. Together, studies carried out across a range of instructional environments and activities have informed the field about learners' needs to obtain input

and evidence, to participate in form-focused interaction, to be given form-focused feedback and instruction, and to produce and modify their output. The following section details how research on instructional settings has influenced these theoretical constructs in the field of Second Language Acquisition.

## The Effect of Instructed SLA Research on Theoretical Constructs

*Input, Evidence, and SLA in Instructional Perspective*

That L2 learners need to access comprehensible, meaningful input for their learning is fundamental to second language acquisition theory. One of the most comprehensive discussions of input appeared in a chapter of the original *Handbook of Second Language Acquisition* (Long, 1996), and has been updated by Long for the current volume. According to Long, learners need access to input that supplies positive evidence of relationships between message meaning and the form in which that meaning is encoded. Such input is found in the texts they read and hear, and in the responses they receive to their questions and comments. When the input is repeated, reformulated, and modified to insure comprehensibility, its form and meaning relationships become more perceptually salient and available to the learner. Since learners often need to have messages made comprehensible, modified input provides an excellent source of positive data on L2 morphology, syntax, and lexis. Unfortunately, it is not a guaranteed source, nor is it always sufficient, particularly for providing access to L2 forms and features that are low in salience or lack communicative transparency. In English, for example, forms such as articles and determiners, with their elusive rules and patterns of use, are difficult for learners to notice on their own. Researchers have explored alternative ways to promote access to them.

One approach has been to enhance or enrich the input in which these forms appear. However, studies in which such forms have been highlighted visually (Izumi, 2002; J. White, 1998), or made more abundant through "flooding" in written and spoken texts (Trahey & L. White, 1993) have had disappointing results. While some degree of noticing appeared to occur, its interlanguage application was incomplete. Thus, in the Izumi study, the enhanced forms were not sufficiently noticed to affect learners' ability to use them in text reconstruction. In the J. White study, even though learners were given texts with italics, bolding, enlargement, and underlining, these enhancement devices did not make a significant difference in their learning of possessive determiners. In the study of Trahey and L. White, learners were able to add correct forms to their interlanguage, but were not able to substitute them for older, incorrect versions, which remained in the interlanguage as well.

A related approach has been to make learners' more aware of low salience forms through "consciousness raising" experiences that range from providing them with texts in which the forms are highlighted and to offering explicit instruction and explanation on form application (Rutherford & Smith, 1985), to deciding among and discussing form choices in grammar based activities (Fotos, 1994; Fotos & R. Ellis, 1991). Although some success has been reported with respect to learners' ability to notice these forms in future contexts (e.g., Fotos, 1994), questions remain about the extent to which these interventions promote the kind of implicit L2 knowledge learners need for to make form generalizations and apply to productive use (See Doughty & Williams, 1998, pp. 239-240).

To help them notice items that are low in salience and to manage and overcome the errors that ensue, learners appear to benefit from input that supplies negative evidence about what is *not* in the L2. As Schmidt found from self-study of his own learning processes (Schmidt & Frota, 1986), even frequent exposure to forms that were low in perceptual salience was not sufficient for him to detect what he needed to develop and change them in his own production. Only when he was able to notice the "gap" between his own, and target versions, was he able to move on in his development and application of these forms. Schmidt identified the importance of negative evidence through an instructional environment that included formal classroom learning, everyday social interaction, and informant consultation. His experience has inspired the study of negative evidence across a broad range of contexts.

Much of what is known about negative evidence has come from studies that examined its role at process and short-term outcome levels, using actual or adapted instructional materials or instructor intervention to deliver treatments and collect data. These studies first identified L2 forms and structures whose limited saliency or relative complexity made them difficult for learners to master, but whose development was underway. Negative evidence was then provided through "negative" or corrective feedback to learner mis-productions or incorrect selections of these forms and structures, and its usefulness for error revision and L2 development was tracked. These studies revealed important findings on the role of negative evidence in the modification, development, and in some instances, retention, of linguistic items that had heretofore defied the learner's mastery.

Thus, in studies on English language learners, Carroll and Swain (1993) found that a combination of instruction and negative feedback promoted gains for dative constructions. Williams and Evans (1998) found that such a combination also helped learners with participial adjectives, but not passives, apparently because they had better control over the participial forms to begin with, and thus were more ready to make gains in their acquisition. Negative evidence (L. White, 1991) was able to assist French learners with English L2 adverb placement rules whose tiny differences with French had

defied the learners' grasp. Mackey and Philp (1998) and Spada and Lightbown (1993) found that negative evidence helped students progress through the stages of question formation, each an important step toward mastery of this complex construction. Doughty and Varela (1998), whose treatment was more lengthy and intensive than others carried out in the instructional environment, found that feedback presented through repetition and recasting of past tense and aspect errors had a positive and lasting effect on students' learning.

With respect to languages other than English, Long, Inagaki, and Ortega (1998) found that negative evidence, delivered through interlocutor recasts immediately after a learner mis-production made a difference in adjective ordering in Spanish and adverb placement in Japanese, especially when compared with an instructional modeling treatment provided right before the learner's attempts at production. Finally, Tomasello and Herron (1988, 1989) found that when errors were induced and feedback was immediate, learners were better able to revise grammatical features in French L2 that were prone to errors of English L1 transfer and overgeneralization.

Many of these studies were implemented under controlled conditions, in which actual or adapted instructional materials were used to deliver treatments and collect data (See Carroll & Swain, 1993; Iwashita, 2003; Leeman, 2003; Long, Inagaki & Ortega, 1998; Mackey, 1999; Mackey & Philp, 1998; Oliver, 1995; Williams & Evans, 1998). Others were carried out in intact classrooms with researcher intervention (e.g., Doughty & Varela, 1998; Lyster & Mori, 2006; Oliver, 2000; Oliver & Mackey, 2003; Tomasello & Herron, 1988, 1989; Lightbown & Spada, 1990; L. White, 1991). These studies have revealed that negative evidence can be provided through formal instruction and explicit corrective feedback, as well as from feedback that arises when interaction is modified in order to achieve mutual comprehension. This latter, known as the negotiation of meaning, has been shown to occur frequently during conversational interaction in which learners engage, and to provide an especially rich resource for input and evidence adjusted to their linguistic and communication needs.

*Modified Interaction as a Source of Evidence*

When interaction is modified by the negotiation of meaning, teachers, classmates, and other interlocutors request clarification or confirmation from the learner through utterances that attempt to understand the learner's intended meaning. These brief, but frequent interludes help the learner to *focus on form* (Long & Robinson, 1998; Doughty & Williams, 1998) by shifting the learner's attention to the form of the message and to possible problems with its encoding. Simple signals such as "What did you say?" or "Please repeat" are often used as well as linguistically elaborated responses. When an interlocutor seeks to confirm the learner's message, and thereby reformulates it, this helps the learner to notice the

gap between the interlanguage encoding of its meaning and the encoding of that meaning in the interlocutor's request. This is shown in the following brief exchange:

Example 1.
**Learner:**     My grass broken
**Interlocutor:** Your glasses? Are your glasses broken?

The importance of mutual comprehension and message comprehensibility becomes especially acute when interaction is goal oriented and requires learners and interlocutors to exchange and integrate information they hold individually in order to solve a problem or complete a task. (e.g., classroom-based studies of Pica, Lincoln-Porter, Paninos, & Linnell, 1996; Pica, 2002;  Pica & Washburn, 2003). Such a focus on message form is incidental, however, as learners' attention is necessarily devoted to repairing and resolving impasses in message communication in order to reach their goal. In many cases, the attention paid to a message is not directed at the accuracy of its grammatical form, but rather the preciseness of its content. Below is an example of what frequently occurs when an interlocutor is asked to reproduce a picture based on directions from a learner:

Example 2.
**Learner:**     Two book. Draw two book.
**Interlocutor:** Two? Did you say two?
**Learner:**     Yes

Thus, one of the concerns about negotiation is that its inexactness for drawing attention to form and meaning limits its sufficiency for L2 learning. Nevertheless its frequency of occurrence during goal oriented interaction makes it a useful, if inexact source of negative evidence for the learner.

When comprehensibility is not at issue, as often happens when teachers are familiar with their students' interlanguage errors and are engaged with them in classroom routines and lessons, the teachers may use negotiation signals to promote accuracy, through what has been referred to by Lyster (1998) and Lyster and Ranta, (1997) as the negotiation of form. They found this signaling technique to be particularly effective for learners in correcting their lexical errors and many of their syntactic errors as well. To modify their phonological errors, however, learners in their studies appeared to benefit from another kind of intervention, known as recasts. These responses, known to be abundant in classroom and caregiver settings, have been the subject of numerous studies in the instructional environment. Results of the studies have not been uniform, but their further analysis has shed light on the conditions of time and setting in which recasts work best.

*Recasts: Variation across the Instructional Environment*

When interlocutors respond to a learner by recasting the learner's message they restate what they believe to be the meaning of the message, but they recode its errors into an accurate form. This recoded message provides positive evidence as input for learning. Its timely proximity to the learner's error provides negative evidence that helps the learner to notice the gap in form between the original message and the recast one. There has been a considerable amount of debate about recasts as an intervention in the learning process. While acknowledging the effectiveness of the recast in drawing the learner's attention to form and meaning, some researchers question whether it is the positive, negative, or combined evidence that makes the recast an effective response to the learner. Other researchers point to studies in which recasts were not effective, presumably because their preservation of the message meaning had made their minor corrective properties difficult for learners to notice.

In attempting to resolve this theoretical debate, several studies, (Ayoun, 2001; Doughty & Varela, 1998; Leeman, 2003), together with reviews of recast studies and comparisons of their methods by Doughty (2001) and Nicholas, Lightbown, and Spada (2001) have shed considerable light on the ways in which recasts can best help the learner. These works reveal that both the positive and the negative evidence in a recast can be useful. Because recasts are encoded as immediate, semantically contingent response moves, their formal and functional properties are made more salient to the learner, so that they can be noticed and applied to the developing grammar. Thus, it is the immediacy in timing and saliency of positioning of recasts that make useful to the learner.

Beyond settling a theoretical debate, the analysis of recasts has revitalized the role of positive evidence in the L2 learning process. Meaningful, comprehensible input works best when given in response, rather than pre-emptively through initiation moves, to the learner. Lending further support to this perspective is a study by Long et al. (1998), and a review by R. Ellis (1999). Together, they emphasize that where positive evidence does not make a difference for the learner, the evidence has been supplied in the form of enhanced texts, pre-modified on the basis of interlocutor judgments about the learner's abilities and needs. In studies where positive evidence does make a difference, the evidence has come from immediate interlocutor responses that incorporate or reformulate the learner's very own message. This form of adjusted input is far more direct and individualized than its pre-modified counterpart.

Several studies have pointed out the fact that recasts are not always practical. First, the limited salience of their reformulation makes them less likely to be noticed by learners, compared, for example with explicit corrections or even confirmation checks, which also reformulate, but do

so with through a shift toward rising intonation. Even those recasts that are noticed have been found to have little impact in the immediate term (e.g., Mackey & Philp, 1998; and Philp, 2003). Findings on recasts in the classroom setting have been subject to these same concerns, as it is difficult for teachers to recast errors of form when they are engaged in meaningful instruction. As Lyster (1998) and Lyster and Ranta (1997) have noted, when recasts are used in controlled research conditions, their function is restricted to that of responses to errors. However, during classroom interaction they can be serve as reinforcements to student contributions of accurate content and as expressions of approval or acceptance. These non-corrective, pedagogical functions of classroom recasts tend to obscure the negative evidence they contain. Thus, Lyster and Ranta (1997) found that classroom learners were less likely to notice or show "uptake" of the negative evidence that was encoded in their teacher's recasts, and were more responsive to their teacher's explicit corrections and form-focused instruction.

A recent study by Lyster and Mori (2006) has pointed out the role played by context and setting in determining the effectiveness of recasts in getting learners to demonstrate their uptake and repair their errors. Though recasts were abundant and predominant in the two very distinct immersion environments they compared, learners in the environment with a lower communicative orientation responded to them more frequently than learners in a more communicative program, where the learners were more responsive to prompts. Accordingly, Lyster and Mori advanced their "counterbalance hypothesis," that instruction and feedback are more likely to be effective when they are counterbalanced, rather than congruent, with a classroom's predominant communicative orientation.

*Form-Focused Instruction*

During form-focused instruction, learners are provided with information and corrective feedback about language forms and rules within the context of communicative activities, through either immediate, extemporaneous intervention within a communicative activity or in follow up work shortly thereafter (Lightbown & Spada, 1990; Spada & Lightbown, 1993). Instructional features such as display or evaluation questions, metalinguistic statements, and explicit evaluations provide relevant information on what the learner can do in order to understand and produce the L2. In form-focused instruction, whether immediate or delayed, there is usually a reference to the learner's problems with form, especially the ways in which such problems can interfere with the communication of meaning.

Functional grammar instruction (Harley, 1989), is also form-focused, but is implemented through materials and activities pre-planned from the classroom curriculum. These instructional tools integrate a form-focused component into a content-oriented classroom. Students are

provided with opportunities to practice specific forms that they have not been able to learn from subject content alone, by engaging in a range of classroom experiences, including role plays, class projects, problem solving grammar tasks, and board, card, and picture games. These additions to their curriculum facilitate access to L2 forms through the communicative functions and meanings that they serve.

Research on functional grammar instruction, carried out predominantly in Canadian French immersion programs, has revealed positive outcomes for students' learning of French L2 conditionals (Day & Shapson, 1991); verb tense and aspect markers (Harley, 1989); noun gender marking (Harley, 1998); and *tu-vous* distinctions (Lyster, 1994). Aside from revealing the value of functional grammar instruction to L2 learners, these studies have shown researchers that it is possible to carry out studies on SLA in authentic classroom environments. Not only did the classrooms provide cohorts of learner participants, they also allowed for an extended period of instructional treatment, data collection, and testing as well as all too rare outcomes data on SLA.

*Processing Instruction*

As another type of instruction oriented toward drawing attention to form, processing instruction, has been successful in helping learners to identify sentence constituents and understand message meaning (e.g., VanPatten & Cadierno, 1993). Learners are given explicit instruction on how to process L2 input whose word order is different from that of their first language or is a marked alternative in the L2. Passive constructions in English are good candidates for processing instruction that identifies sentence agents and objects to learners who are used to relying on the unmarked, "default" Subject-Verb-Object (SVO) patterns they already mastered in their L1. After instruction, learners are better equipped to understand the correct meaning of "The dog was chased by the cat" than they would have been, had they relied on predictable SVO order and real world experience to believe that it was the dog who was chasing the cat.

Processing instruction appears to be especially effective for assisting learners' comprehension of sentences with marked constituent order. As several studies have revealed, however, not all rules, forms, and structures are amenable to this approach. As was illustrated by Allen's work (2000) on French causative verbs and DeKeyser and Sokalski's (2001) studies on Spanish morphosyntax, rule focused and practice oriented instruction can be just as effective as processing instruction for aiding learners' sentence comprehension and interpretation and more effective in facilitating production of most grammatical forms and constructions.

*Output Production and Advancement in SLA*

In addition to the positive and negative evidence that comes from modified input, feedback, and instruction, learners' own production can

serve as a resource for evidence, as well as a mechanism for important learning processes. Some of the most compelling arguments about the role of output have come from Merrill Swain (1985, 1998), and originated with her review of test data on long-term French immersion learners. Her analysis revealed scores that were considerably lower in production accuracy than in the receptive areas of reading and listening, despite the learners' access to input that was meaningful, copious, and comprehensible. To explain the data, Swain turned to the instructional environment of the immersion classroom. Its emphasis on content transmission necessarily reduced students' opportunities to produce spontaneous L2 output and to adjust what might be a comprehensible, but grammatically inaccurate message into a syntactically more successful one. She proposed that if all learners, not just those in classroom settings, were given opportunities to modify their message production toward greater comprehensibility or accuracy, they might be able to move from an interlanguage characterized by semantic processing and juxtaposition of constituent features, to one distinguished by syntactic processing and message organization.

From her initial argument about "comprehensible output" as a necessary mechanism in SLA (Swain, 1985, p. 252), Swain went on to propose that learners' production, especially their modified production of their responses during collaborative undertakings, would be a source of feedback and a basis for their hypothesis testing. It could also help them notice the insufficiencies of their own grammatical and lexical repertoires, and motivate them to listen more carefully for needed structures and words in new contexts in which such features might be found. Over the years, many of Swain's proposals have been confirmed through studies in authentic and controlled classroom settings (e.g., He & Ellis, 1999; Izumi, 2002; Linnell, 1995; McDonough, 2005; Paninos, 2005; Pica, Holliday, Lewis, & Morgenthaler, 1989; Shehadeh, 1999, 2001; Swain, 1993; Swain & Lapkin, 1998).

Some of the research has shown that output production prior to opportunities to hear input and notice its features is more effective for SLA than input noticing activities alone (Izumi, 2002; Paninos, 2005). Other studies have shown that interlocutor feedback can affect the learner's ability to produce syntactically complex and accurate structures (Linnell, 1995) and to advance through the stages of question formation (McDonough, 2005). These and other studies have revealed ways in which the impact of output on the learning process is heightened when it is produced in response to feedback. While feedback has long been viewed as a means whereby learners can seek additional input (Krashen, 1976), and more recently as a source of negative evidence, it appears equally important as a trigger for learners to modify their production of output and thereby advance their interlanguage development.

An increasing number of researchers have focused on learner production within the theoretical perspective of information processing theory, which views SLA as the acquisition of a complex cognitive skill, and therefore responsive to direct instruction and practice. The most convincing studies have used artificial languages, assisted through monitored, computer interaction, which allowed the researchers to control instructional treatments and track learning over time (e.g. de Graaff, 1997; DeKeyser, 1997). Learners were first given explicit instruction of linguistic rules, which was followed by opportunities for practice. This combination was shown to greatly aid the learner's ability to apply the rules to subsequent activities. Although there have been theoretical concerns as to whether the resultant learning revealed skill demonstration only and not implicit, generalizable knowledge, one of the most carefully implemented studies (DeKeyser, 1997) found that production practice might best be viewed within the framework of rule automaticity. Accordingly, DeKeyser has argued that a sequence of explicit rule learning followed by opportunities for practice and application can lead to highly automatized L2 knowledge, readily available for a range of communicative uses.

*L2 Teachability and Learner Readiness*

The importance of readiness for instruction has been a theme with considerable resonance in the field of SLA for several decades. Early on, in advancing his "input hypothesis," Stephen Krashen (1981) looked to the importance of the learner's readiness for what he considered optimal and sufficient input. As such, the input would need to be meaningful, comprehensible, and encoded slightly beyond students' current level of language development. Because these features were difficult to operationalize for empirical study, the construct remained acknowledged, but untested, until Manfred Pienemann's studies on developmental stages in German L2 and his "teachability hypothesis" on the role of instructional intervention in speeding up the learner's rate of passage through them (Pienemann, 1985; 1989). His findings revealed that learners could not skip any stages in their sequence of L2 development, but that appropriately timed instruction in features that were teachable, i.e., at the stage just beyond their current stage, could help them go through intermediate steps more quickly than they would have if left on their own.

Thus, Pienemann (1989) and R. Ellis (1989) were able to show that learners at the "particle" stage in their German L2 development benefited from instruction on the next, "inversion" stage when given instruction on particle movement. This enabled them to extend their ability for separating particles from other constituents within phrases and moving them to sentence final position, to the ability to separate and move particles internally, within a sentence as well. Learners at stages below "particle," who could not yet separate particles from other constituents in

phrases, were not yet ready and able to benefit from "inversion" instruction. Recently, Pienemann has advanced his theory of "processability," through which he has been able to predict cross-linguistically the syntactic structures that learners are ready to process at particular stages in their development. His studies of English, Japanese, and Swedish have provided empirical support to his claims (Pienemann, 1998).

Several other studies have expanded the construct of learner readiness by connecting it with instructional features. For example, Mackey and Philp (1998) found that learners who were ready to advance to the next stage of English question formation did so successfully if their question errors were recast. However, other "ready" learners, whose question errors were not recast, did not advance as consistently as the recast group. "Unready" learners were not able to benefit from the recasts of their questions. Similar findings were reported by Han (2002) and Oliver (1995), although their research questions addressed recasts, not readiness. In trying to explain why some of the learners were not able to take advantage of the recasts used in responses to their errors, Oliver, for example, argued that the errors had emanated from spontaneous, conversational interaction, and included mis-produced features and structures that were well beyond the developmental level of the students. Together these studies suggest that it is the combination of readiness for instructional treatment and the treatment type that can make a difference in the learner's progression across the sequences of L2 development.

Lightbown (1998) has raised important issues regarding readiness, within a classroom perspective. Acknowledging the variation in readiness that is likely within a given classroom of learners, she has proposed that form-focused, L2 input, tailored to the more advanced students, can also serve at least some of the input needs of students at lower levels (Lightbown, 1998). Supportive findings from her work with Spada (Spada & Lightbown, 1999) have shown that across the sequences of question formation, even low level students can begin to display knowledge of advanced features, albeit not as consistently as peers who are closer to the stage where these features might next be anticipated. R. Ellis (1989) has provided an additional perspective on variation in readiness, reflected in the higher and lower levels found within each stage of individual learner development. He has suggested ways in which instructional interventions can be tailored to the more advanced dimensions of each stage (R. Ellis, 1995; 2003).

In addition to the issues raised by Lightbown with respect to the feasibility of applying constructs of teachability and readiness within the classroom are concerns about the scope of its application (Pica, 2007), as teachability applies to stage-related forms and constructions, and these constitute only a portion of the L2 forms that learners need to know and be able to use for communication. In English, for example, many L2 forms are acquired, not in developmental sequences, but

on an individual basis, and thus vary according to learner orientations toward functional or formal accuracy, learner age, perceptual acuity, and access to input. Their learning trajectory is less predictable, and their mastery less likely than is the case for forms acquired in a developmental sequence. Grammatical inflections for verb tense and noun number, and functors such as the copula, for example, neither align with developmental sequences, nor fall into a predictable order of acquisition.

Because these variational features often have limited perceptual salience or communicative value for learners, they are seldom mastered on their own (e.g., Harley, 1989, 1993; Long, 1996). Yet, indications of readiness for their learning appear quite early in L2 development, as functions arise for their application, along with contexts for their use, and as the forms themselves begin to emerge, as target-like items as well as mis-formations.

For example, in describing previous events in their lives, learners might not be able to attach the non-syllabic past *–ed* form to a verb, as in, *we moved*. However, their use of a base form of the verb with a past adverbial, as in *we move last year*, or with reference to a time or place in their past, as in *we move 1956* suggests that they might be ready to begin acquiring the *–ed* form to more fully express past meaning. Similarly, they might use the connector *and* instead of *but*, thus filling its function as a connector, albeit a mis-formed one. This would suggest that the learner is aware of the need to express connections grammatically, and is ready to focus on the forms to do so.

Interventions that draw the learner's attention to such features whose functions are already apparent might therefore begin early during the acquisition process, as soon as contexts for their use appear in the learner's messages, when form omission and mis-formation alternate with form suppliance. Such interventions would need to be sustained throughout the course of L2 development, to allow for the time needed for mastery by the learner. In addition to assisting the learner, this approach would also enable researchers to track the learner's increasing accuracy in using these features and to account for the factors behind their variation in the interlanguage.

The learning of variational, low salience forms and the study of their acquisition require a longer stretch of time than that used in most of the studies on SLA. As simple as this seems, its actualization is difficult. It is not easy to locate learners who can commit their time and patience to the research rigors of a long-term project, even if results of the project might lead to information that could assist their learning. The instructional environment can play a crucial role in this long-term endeavor in two distinctive ways, through the design and implementation of task-based activities as tools for L2 instruction, acquisition, and research, and in the use of the classroom as a research site.

## Tasks as Instruments for L2 Teaching, Learning, and Research

Tasks that engage language learners in meaningful, goal-oriented communication in order to solve problems, complete projects, and reach decisions have been used for a broad range of instructional purposes. They have served, for example, as units of course syllabi, activities for structure or function practice, and language focusing enhancements to content based curricula. Connections between task activity and communicative uses of the L2 inside and outside the classroom have made tasks attractive to educators and their students.

Tasks have had great and growing appeal to researchers as well. Demands on learners' attention, comprehension, and production as they carry out a task can lead them to obtain feedback, draw inferences, and test hypotheses about L2 forms and features, and produce more accurate and developmentally advanced output. Observing and measuring these task behaviors provide researchers with further insight into the processes of implicit learning.

Many of the tasks used in research have been taken directly or adapted from professional references (e.g., Brumfit & Johnson, 1979; Ur, 1988), scholarly publications (e.g., R. Ellis, 2003; Nunan, 1989), and student textbooks (e.g., Harmer & Surguine, 1987; Helgesen, Brown, & Mandeville, 2000). Among the tasks most widely used are those which require learners to exchange information, either by drawing from the same initial pool they are given, or by transferring and sharing their initially unique contributions (See Pica, Kanagy, & Falodun, 1993 for an overview and examples). These latter are often referred to as information gap tasks (See Doughty & Pica, 1986; Pica, 2005; Pica, Kang, & Sauro, 2006 for individual studies). Information exchange tasks have been used primarily to ground instructional treatments or interventions that generate opportunities for modified interaction, support provision of modified input, and stimulate feedback and the production of modified output. Many studies cited in this article have used tasks in these ways.

Among the studies, Pica, Lincoln-Porter, Paninos, and Linnell (1996) used information exchange tasks to study the ways in which opportunities for modified interaction on these tasks helped the learners extend modified input and request clarification to each other. The tasks required the learners to choose pictures as their partners narrated a story line. Gass and Alvarez-Torres (2005) used information gap tasks as a way to generate different sequences of input and interaction that could then be studied for their role in vocabulary learning. Tasks designed by Iwashita (2003) for both information transfer and information exchange provided a way to deliver modified input and feedback to learners, which, in turn allowed her to compare the effects of these interventions on Japanese L2 learning. The picture description and drawing tasks used by Nobuyoshi

and Ellis (1993), generated clarification requests to learners' attempts at production, which provided data for their study of the modified output in the learners' responses.

Although the language used to carry out a task need not be pre-specified, a task can be designed so that the information exchanged in attaining its goal favors the use of specific grammatical forms (e.g., Loschky & Bley-Vroman, 1993; R. Ellis, 2003). Many studies have employed such form-focused tasks for variational forms of limited communicative transparency and low salience, as well as for sequential features with considerable operational complexity. These linguistic and communicative properties made forms and features difficult to master despite learners' readiness to do so.

In the study of Doughty and Varela (1998), for example, students' reports of their science experiments provided contexts for them to produce past time morphology. When they made errors of suppliance, the researchers repeated and recast their utterances, and then tracked the results of this intervention over time. This commonly used classroom task, which was part of the everyday curriculum, thus turned into an effective learning tool for the students, as well as a helpful means of data collection for the researchers.

Pica et al. (2006) applied the structures of three widely used Information Gap Tasks, Spot the Difference, Jigsaw, and Grammar Communication, to the reading passages of a film appreciation course. The resulting tasks were then used to generate learners' modified interaction, noticing, and awareness of English articles and verb morphology in the passage. These were the linguistic features that had been difficult to learn from course content alone. Pairs of learners read the same original passage, and then were given slightly modified versions of the passages, with sentence level differences in articles or verb forms. For example, a sentence in the original passage might have *the table*. The same sentence in one student's version might be modified with *a table*, while the other student's version would retain *the table* from the original. Each pair had a mix of some of the original and modified sentences.

Without looking at each other's versions, they were asked to work together to locate differences between the sentences (for Spot the Difference), and/or reorder the sentences to match the original (for Jigsaw), or fill in blanks to make the sentences complete (for Grammar Communication). They then had to choose what they believed were the "better" versions of their sentences, justify their choices for selection, and recall the selected sentences in order to jointly reconstruct the original. All three tasks were effective in drawing students' attention to the targeted forms and retaining them during text reconstruction over the short duration of the study.

Muranoi (2000) also focused on English articles through problem solving tasks that required article suppliance for their completion. She used the tasks to look for ways in which learners produced and modified their

production as they negotiated their plan for solving the problems. Similar design and implementation of tasks that drew learners' attention to low salience features were shown by Iwashita (2003) for particles in Japanese; Leeman (2003), for features of Spanish agreement; Long et al. (1998), for Japanese adjective ordering and locatives and Spanish adverb placement; Mackey and McDonough (2000) for Thai noun classifiers; Newton and Kennedy (1996) for English prepositions and conjunctions; and Nobuyoshi and Ellis (1993) for English past time markers. Researchers have also customized tasks to draw learners' attention to sequentially acquired, complex forms such as English questions and relative clauses. Some of their studies (e.g., Izumi, 2002; Mackey & Oliver, 2002; Mackey & Philp, 1998; McDonough, 2005; Spada & Lightbown 1999) have been described in this article.

Socioculturally oriented, information exchange tasks are designed to promote collaborative interaction through which learners can support and guide each other's L2 learning. Merrill Swain and Sharon Lapkin (2001), for example, have used the "dictogloss" to provide a basis for the process of "scaffolding," whereby learners can support each other when confronted with task components they cannot yet accomplish on their own (See also Kowal & Swain, 1994). Working independently, learners take notes while listening to a teacher-delivered text. Next they meet in pairs or groups, using their notes to co-construct the text, which they then present orally to their classmates. The task appears to be especially effective for vocabulary learning (e.g., de la Fuente, 2002; Gass & Alvarez-Torres, 2005; Smith, 2005, Swain, 1998, and Swain & Lapkin 2001).

As this brief review makes evident, task methodology has been effective in helping learners with forms that they are ready to learn but find challenging. At the same time, it provides researchers with an effective approach to data collection on important L2 processes and outcomes. However, task methodology has been employed largely in short-term research. Even when durations of several weeks time were reported, these durations included delayed post testing, carried out after the actual treatment was over (e.g., Doughty & Varela, 1998; de la Fuente, 2002; Iwashita, 2003; Izumi, 2002; Smith, 2005; Spada & Lightbown, 1999; Takashima & Ellis, 1999).

Just as extending the period of time for post testing is important for addressing questions on L2 retention, so too is extending the period of treatment time important for questions on learning processes and L2 outcomes, especially for those areas of SLA that defy short-term intervention. Ideally, a controlled environment would allow for the isolated study of key factors of input, interaction, feedback, and output in SLA. The use of tasks would surely provide a good deal of relevant data in these areas. Realistically, though, finding learners willing to participate in a controlled study, over an extended time, is not an easy enterprise for SLA researchers. Opportunities to compensate through funding or

through tutoring or teaching services, though possibly effective, are usually not feasible, due to cost and time constraints. This is where intact classrooms might play an important role. Although they do not allow for random selection and assignment, they can provide large cohorts of learners, who are likely to be available for weeks or months of treatment time. Most learners and their teachers would be familiar with the kinds of information exchange tasks that have originated from, and can be accommodated to, their current, familiar classroom curriculum. The combination of tasks and classroom settings can play a role in the methodology needed to address questions on SLA within and beyond the instructional environment.

## Conclusion: Expanding the Role of Tasks and Classrooms in SLA Research

L2 classrooms are first and foremost environments for teaching and learning. Although they also serve as environments for research, much of the research in classrooms to date has been aimed at describing instructional practices rather than testing the effects of instructional interventions on SLA. Studies that expanded the role of the classroom as an SLA research environment (e.g., Day & Shapson, 1991; Doughty & Varela, 1998; Harley, 1989, 1998; Lyster, 1994) are instructive in the design of future studies. All used activities and tasks that were consistent with the curriculum, schedule, and format of the classrooms where they carried out their studies, and were therefore not intrusive to the work of teachers and students.

Information-Exchange tasks add an additional component to research in the classroom, however, due to their dual role as tools for data collection and instructional interventions. As learners work together to reach task goals, their L2 exchanges provide interaction-based data that can address questions on evidence, its accessibility through input, interaction, feedback, and output, and its relationship with cognitive processes such as noticing and attention, However, when designed with research concerns in mind, such tasks also risk of appearing like tests to classroom participants, as indeed was found by Pica et al. (2006). Their attractiveness for communication can be offset by their inconsistency with the content of the classroom curriculum. Learners might be willing to carry them out over the short-term, but are likely to lose interest in them over time.

To enhance their authenticity and insure their long-term use, research tasks first need to be integrated into curriculum texts, topics and assignments, and have enough variety to warrant sustained participation. With this in mind, Pica et al. (2006) based their research tasks on the texts students were asked to read and discuss in their daily classroom life. In keeping with the course emphasis on

academic English, task directions began with a purpose statement, i.e., that the task would help the students become "more accurate and precise" in their speaking and writing in areas such as reviewing, editing, organizing and reporting information. The tasks were simple to implement for long-term application by the teacher, as the researchers could not be on hand on a daily basis. Teacher, researcher, and student involvement was ongoing in task design, piloting, and revision. Directions were reworded and revised frequently, based on numerous pilot runs. Such preparation, though labor intensive, was considered an investment by the researchers, affording both the opportunity to carry out more than one study, and to collaborate, present, and publish their work over time.

Early in this article, methodological issues were raised regarding the instructional environment from the point of view of L2 teaching and learning, as well as research on the SLA that occurs there. A meta-analysis by Norris and Ortega (2001) had found that explicit, form-focused instructional environments resulted in more accurate and advanced SLA outcomes than those that had followed implicit approaches. However, as they argued, this was largely because so many of the analyzed studies had used short-term treatments, and documented L2 learning through discrete point tests. These two characteristics reduced the possibility for a valid comparison, as implicit approaches are claimed to promote implicit knowledge. Such knowledge takes a long time to acquire and is ill-served by isolated test items.

The findings of the meta-analysis suggested several new directions for the field. One direction involved the tracking of the ways in which explicit learning might contribute to the implicit knowledge that learners eventually come to use. Research on this front is well underway (e.g., DeKeyser, 2003). Another direction was to lengthen the treatment and research time for both individual studies and multi-study comparisons. Any number of controlled settings would be ideal for such projects, but it is difficult to imagine many participants able and willing to commit to this effort. The classroom, with a cohort of learners in place over time, offers a site worth considering, not only for its promise in responding to issues on the consequences of implicit L2 teaching, but also for its ecological validity in informing questions on evidence, input, feedback, and output. From its introduction of theoretical constructs such as "notice the gap," "focus on form" and "teachability," to its contributions of task-based activities and classrooms sites, the instructional environment has made many contributions to the study of SLA. The richness of these resources for responding to current methodological needs and addressing broader research goals bodes well for contributions of an even greater magnitude through future studies.

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