
Input Processing and Second Language Acquisition: A Role for Instruction

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AS ATTENTION TURNED TOWARD THE role of input in second language acquisition (SLA) to address questions surrounding acquisition orders and transitional stages of competence (e.g., 14), some researchers began to question the role of explicit instruction in grammar (e.g., 20; 21; but see also 27 for earlier discussion).¹ For these researchers, explicit instruction in grammar (i.e., deliberate attempts to focus learners' attention on the structure and forms of language coupled with practice in manipulating those forms and structures) was thought to aid very little in the acquisition process. SLA itself was viewed as the process of extracting data from the input during exposure to the speech of another person. Classroom learning was shown to resemble, if not be the same as, non-classroom learning as far as route of acquisition was concerned (e.g., 6; 9), and to a certain degree, the acquisition of a second language also resembled first language acquisition (e.g., 43).

Partly as a reaction to Krashen and partly as natural growth in the field, research and discussion began to suggest that explicit instruction was beneficial (e.g., 24; 30), that it was necessary (e.g., 15), that exposure to input was not enough (e.g., 34), and that classroom learning (regardless of focus of instruction) resulted in "more acquisition" in learners than non-classroom environments (e.g., 28). Research also suggested that the effect of explicit instruction was constrained by learnability (e.g., 31), while other research began to incorporate

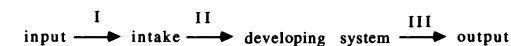
Chomskyan theory as a means of pinpointing a role for explicit instruction (e.g., 16; 41; 42). Since the early seventies, when research first began to look at SLA, evidence has slowly accrued that explicit instruction can facilitate SLA.

The purpose of the present paper is not to enter into the debate on whether or not there should be a role for explicit instruction in grammar in language teaching. Following Garrett, we adopt the position that research on explicit instruction should consider what kind of grammar instruction language learners can use. It may very well be that previous research is limited because both the grammar that has been taught and the manner in which it has been taught do little to affect the *processes* that underlie acquisition. In the present paper, we reconsider the nature of explicit instruction vis-à-vis the processes involved in language acquisition and language use. Specifically, we will focus on the relationship between explicit instruction and input processing. We report the results of a study on the effects of two different types of instruction on the developing knowledge system of the L2 learner: instruction as the manipulation of output and instruction as structured or focused input processing.

SLA AS INPUT PROCESSING

SLA is multifaceted by nature, and more than likely no single theory of language or psychology will be able to capture how language acquisition happens (5; 41). Whatever one's theoretical bent, most would agree that SLA consists of sets of processes as sketched in Figure I. What Figure I attempts to capture are three distinguishable sets of processes in acqui-

FIGURE I
Processes in Second Language Acquisition



sition. The first (I) converts input to intake. From intake the learner must still develop an acquired system; that is, not all of intake is automatically fed into the acquired system. The second set of processes (II) then includes those that promote the accommodation of intake and the restructuring of the developing linguistic system (25; 41; 42). Finally, research on output reveals that learner language is not a direct reflection of acquired competence. Thus, a third set of processes (III) must be posited to account for certain aspects of language production, e.g., monitoring, accessing, control, and so on.

Input processing is concerned with the first set of processes; that is, the conversion of input to intake. While different perspectives can be taken on input processing (see 13; 35; 36), we will use the notion of “form-meaning connection” to discuss the processes involved in the conversion of input to intake. That is, input processing, as used here, involves those strategies and mechanisms that promote form-meaning connections during comprehension (see 36 for a discussion of input processing). Comprehension and input processing are not equivalent terms. Given that input processing involves making form-meaning connections that can be used for acquisition (note the implicit relationship between I and II in Figure I), sufficient arguments exist that comprehension does not necessarily lead to acquisition (e.g., 8; 35; 36; 42).

At this juncture we must define “input,” since the term has been used in a variety of ways. Krashen (20; 21, and elsewhere) has suggested that *comprehensible* input is a necessary ingredient for acquisition. White (42) has argued that *incomprehensible* input may trigger the acquisition of some aspects of the grammar. Schwartz suggests that primary linguistic data defined as utterances in the target language constitute the input necessary for the language module described by Fodor. What is common to all these conceptualizations—and what defines input as we use it in this paper—is that input must be *language that encodes meaning*. That is, the input necessary for language ac-

FIGURE II
Traditional Explicit Grammar Instruction in Foreign Language Teaching

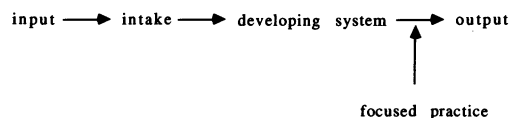
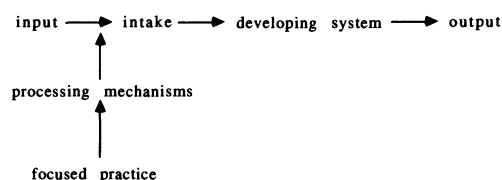


FIGURE III
Processing Instruction in Foreign Language Teaching



quisition must contain meaning to which the learner attends for its *propositional content*. So called negative evidence and much of corrective feedback focused on grammar is not language that contains propositional information. They do not enter into the definition of input that we use here. We do not view input as explanations about how language works. In short, input for us contains referential meaning.

In order to understand the connection between input and instruction that we would like to make, we must remember how traditional explicit instruction in grammar occurs. Normally this instruction focuses on the manipulation of learner output. That is, instruction occurs by explaining a grammatical concept and then having learners practice producing a given structure or form (see Figure II). Given the rather important role that input plays in SLA, the value of grammatical instruction as output practice is questionable if the attempt of the instruction is to alter the nature of the developing system. Note that in Figures I and II, the input data (i.e., intake) flow into the developing system. In other words, the arrows go from left to right, not from right to left. Rather than manipulate learners' output to effect change in the developing system, instruction might seek to change the way that input is perceived and processed by the learner. This approach to instruction is depicted in Figure III. Theoretically,

altering input processing should have a significant impact on changing the internalized knowledge.

To research such a hypothesis one must first identify the strategies and mechanisms used during input processing. While much is not known about input processing, some discussion appears in the literature about how learners process input (e.g., 4; 8; 13; 17; 18; 32; 37). In addition, research in child L1 acquisition offers discussion of possible strategies used by L2 learners while processing input (e.g., 29). One strategy that has received considerable attention involves the use of word order to assign argument structure to an input string. Evidence from child L1, and both child and adult L2 studies, shows that early and intermediate learners assign agent status to the first noun(phrase) of a string and object status to the second noun(phrase) (2; 3; 7; 12; 23; 26; 38). While this may be a useful L2 strategy when applied to English input sentences (except for passives and clefts), it is not such a useful strategy for Spanish. Spanish has flexible word order allowing a number of surface structure possibilities: SVO, SOV, OVS, OV. Given that ambiguity can result, Spanish uses the case marker *a* to identify objects when both are capable of performing the action: *El señor sigue a la señora. / A la señora la sigue el hombre*, "The man follows the woman."

With clitic object pronouns, word order is less flexible with obligatory preverbal position for object pronouns when the verb is a simple finite verb. The subject may be placed before or after the verb depending on features of discourse, style, and pragmatics. The following two sentences are both translated as "The man follows her."

El señor la sigue.
The man-SUBJ her-OBJ follows.

La sigue el señor.
Her-OBJ follows the man-SUBJ.

Research on learners of Spanish has shown that input strings in which subject-object (agent-object) order is reversed are misassigned argument structure (e.g., 22; 23; 38). That is, preverbal clitic object pronouns are misinterpreted as subjects and postverbal subjects are misinterpreted as objects as in the following example:

La sigue el señor.
*She follows the man.

The result in the learner's developing system as revealed by output is an absence of object pronouns or the misuse of object pronouns as subjects of a sentence, incorrect placement of object pronouns, the (re)setting of an incorrect parameter (that is, the learner may assume that Spanish is [-null-subject]), the absence of the case marker *a*, and difficulty in the acquisition of a certain class of verbs that obligatorily place subjects in postverbal position (e.g., *gustar*). In short, learners fail to see that Spanish is not a rigid SVO language.

PRESENT STUDY

The present study examines the outcome of explicit instruction in processing input. That is, unlike traditional FL instruction, we seek to alter the strategy by which learners make form-meaning connections when exposed to input strings (compare Figures II and III). In the study reported here, we discuss the impact of attempting to alter learners' processing of input containing non-SVO order. As part of the study we compared three groups. The first received traditional explicit instruction in object pronouns. The second received "processing" instruction on the same. The third received no explicit instruction at all regarding object pronouns. We asked the following questions at the outset of the study: 1) Does altering the way in which learners process input impact on their developing systems? 2) If there is an effect, is it limited solely to processing more input or does instruction in input processing also have an effect on output? 3) If there is an effect, is it the same one that traditional instruction has (assuming an effect for the latter)?

Subjects. Three second year university level Spanish classes at the University of Illinois were selected at random from those available in the Spring of 1991 for inclusion in the present study. Each class was randomly assigned to one of the treatment groups. Group N (no instruction) consisted of eighteen subjects, Group P (processing instruction) consisted of nineteen subjects, and Group T (traditional instruction) consisted of eighteen subjects. Pretesting eliminated several subjects in each group, as did recurrent absenteeism from post-testing phases (see below), so that in the final analysis each group had seventeen, seventeen, and fifteen subjects respectively.

Subjects were enrolled in a program with a communicative methodology modeled on the Natural Approach where emphasis is placed on

developing communicative skills in the second language. Classes met four days a week with the bulk of class time spent on interaction, listening, and reading. The grammar instruction of the regular curriculum was limited to textbook and workbook exercises done as homework. However, throughout the time period for this experimentation, subjects were not scheduled to receive explicit instruction in object pronouns and word order.

Instructional Packets. Since the aim of the present investigation was to examine the impact of different types of instruction on the learners' developing system, two instructional packets were constructed for use during the instructional treatment. These packets reflected two different approaches to the teaching of the clitic direct object pronouns. The first approach consisted of traditional grammar teaching and oral practice, while the second, called processing instruction, involved teaching the subjects to process input sentences differently from the strategies described earlier.

Traditional instruction involved presenting the subjects with explanations concerning the form and position of direct object pronouns within the sentence and then giving them practice in how to make sentences with those pronouns. Presentation involved a paradigmatic chart that included all persons (both singular and plural) and an explanation of what objects and object pronouns are. The presentation also included a description with examples of correct placement of object pronouns within a sentence. Subjects were taught that object pronouns always preceded simple conjugated verbs but could be placed at the ends of infinitives and present participles.

In terms of practice, traditional instruction involved moving the subjects from mechanical form oriented practice (oral and written transformation and substitution drills) to meaningful practice (oral and written questions, simple sentence formation) and finally to more open ended communicative practice (oral and written question and answer, conversation). At all times the traditional instruction focused the learners on *producing* the targeted items. The instructional packet that comprised this type of instruction was based on *Puntos de Partida* (19) and on its workbook (1). Examples of the types of activities present in traditional instruction are presented in Appendix A.

Processing instruction, on the other hand, involved: 1) teaching the subjects how to correctly interpret OVS strings, both when the O con-

sisted of a full noun and when it consisted of a clitic object pronoun; and 2) having the students respond to the informational content of OV strings. The instructional packet that comprised this type of instruction was based on the manual that accompanies *¿Sabías que...?: Volume I* (39).

In processing instruction, the presentation of the direct object pronouns first contrasted the grammatical concepts of object and subject of a verb, and then presented both subject and object pronouns. For example:

SUBJECT	OBJECT
<i>yo</i>	<i>me</i>
<i>Yo comprendo a mi hermano.</i>	<i>Mi hermano me comprende.</i>
(I understand my brother)	(My brother understands me)

The presentation of the pronouns was followed by explanations of important points to keep in mind about the pronoun position in Spanish. Students learned that in Spanish, unlike English, it is possible to have such sequences as object pronoun-verb-subject.

Lo llama María.
 him-OBJ calls Mary-SUBJ.
 "Mary calls him."

In the section on the object marker *a*, subjects in the processing group learned that full object nouns may be placed before the verb:

A María la llama Juan.
 Mary-OBJ her-OBJpro calls John-SUBJ.
 "John calls Mary."

Two types of activities followed the presentation and explanations of the object pronouns. One type had subjects listening to utterances or reading sentences and then somehow demonstrating that they had correctly assigned argument structure to the string. This typically involved selecting the drawing that best represented what was heard/read or selecting the best English rendering of the Spanish sentence. The second type of activity had subjects respond to the content of an utterance or sentence by checking "agree" or "disagree," "true for me" or "not true for me," and so on. In several activities subjects read a very short passage in which subsequent to reading the passage, sentences with object pronouns were highlighted and subjects were asked what those particular utterances meant. We should stress here that *at no point did processing instruction involve the production of the pronoun forms by the*

TABLE I
Summary of Traditional vs. Processing Instruction

Traditional	Processing
Paradigmatic	Non-paradigmatic
Focus on output	Focus on input
Some focus on meaning	Meaning always in focus

learners. In addition, the presentation of the pronouns and the activities that followed them were broken up into two sections with first and second person singular and first person plural constituting the first section and third person singular and plural constituting the second section.

Vocabulary, which consisted of highly frequent items, was the same for both types of instruction. The amount of practice that learners received (i.e., the number of times one produced a sentence in the traditional group vs. the number of times one interpreted or responded to a sentence in the processing group) was also roughly the same for both instructional treatments. Differences between traditional and processing instruction are summarized in Table I, and specific examples of activities for processing instruction are presented in Appendix B.

Pre- and Post-Tests. A pretest/post-test procedure using a split-block design (see below) was used as the means of assessing the effect of instruction. All tests (i.e., the pretest and the three post-tests) consisted of both interpretation tasks and written production tasks. Since a sole focus on interpretation would have biased results in favor of those subjects in processing instruction, a production task would either be neutral or favor the production group, thus counterbalancing the other task. Between the interpretation and production tasks, a distractor task consisting of writing answers to questions unrelated to and not containing the grammatical item under study was given to the subjects.

The interpretation tasks for all tests consisted of fifteen aural sentences. Five of these sentences consisted of SVO word order sentences which served as distractors. Of the remaining ten test sentences, five consisted of sentences of the following type:

Al chico lo saluda la chica.
The boy-OBJ him-OBJ_{pro} greets the girl
"The girl greets the boy."

The other five sentences were of the following type:

Lo saluda la chica.
him-OBJ greets the girl-SUBJ
"The girl greets him."

For the interpretation tasks, subjects were asked to match each sentence they heard with one of two pictures that were simultaneously presented on an overhead projector. The two pictures represented the same action, the difference between them being who the agent was and who the object of the verb was. For example, for the sentence *Lo saluda la chica*, subjects had to choose between a picture of a boy waving to a girl (who did not wave back) and a picture of a girl waving to a boy (who did not wave back).

The production task was based on activities used in traditional instruction and included five items, each of which consisted of an incomplete sentence. The subjects' task was to complete the sentence according to a visual clue. The test items were constructed along the following lines:

El chico piensa en la chica y entonces

"The boy is thinking about the girl and then _____."

Each item was accompanied by two drawings that depicted the content of the sentence. In the above example, the pictures were one of a boy sitting at home thinking about a girl and the second showed the boy calling the girl on the phone. It was assumed that the second picture would guide the subject to create a sentence in which an object pronoun should be used, as in the above example: "The boy is thinking about the girl and then *he calls her*." While the visual cues for the interpretation task were projected from an overhead projector, the drawings used for the production task were on the page along with each item. All test items for both task types involved simple present tense sentences.

Instructional and Data Collection Procedures. A split-block design was used that included four versions of the same test described previously: A, B, C and D. Half of the subjects received version A as the pretest and half received version B. To ensure that subjects understood the nature of the interpretation task, they were given a practice item. To control for familiarity of vocabulary, a list of Spanish-English equivalents was provided to subjects prior to testing. Subjects were given two minutes to study the

list and familiarize themselves with any new words. The interpretation task was always administered before the production task.

After the pretest was administered, classes were randomly assigned to one of three instructional treatments: traditional instruction, processing instruction, and no-instruction, this last being the control group. Subjects in the first two instructional treatment groups received instruction during classtime as part of their normal routine. Both classtime and homework were matched for both traditional and processing instruction in terms of time on task. For both groups, explicit instruction consisted of two consecutive class days with no homework. All experimental instruction was performed by the same person, one of the researchers who was well versed in traditional instruction but had *no prior experience or exposure to the concept of processing instruction*. She was not the subjects' regular classroom instructor and she did not instruct them other than on the two days during which the instructional treatment was carried out. We should point out that at the time of the experimentation, this instructor believed that traditional instruction would result in better production and that processing instruction would result in better comprehension. No attempt was made to sway her from her hypotheses (cf. the results presented later in this paper).

At the end of the second day of instruction, subjects were given the first post-test. Those subjects who received version A for the pretest received version B as the first post-test. Those who received version B for the pretest received version A as the first post-test. Versions C and D were administered one week after instruction and again one month later. As in the case of the pretest and the first post-test, those subjects who received version C for the second post-test received version D as the third post-test. Those who received version D for the second post-test received version C as the third post-test. The administration of a post-test one month after instruction was to determine whether or not instruction had more than an immediate impact on a learner's developing system. Subjects must have been present at two of the three post-tests (in addition to the pre-test) in order to be included in the study. The scores of those who had missed one post-test were entered as missing values.

While the experimentation was carried out in the traditional and processing groups, the no-instruction (control) group had regular class hours and did not receive any special instruc-

tion. Their instructor continued with normal topics and activities outlined in the course syllabus and was unaware of the experimental instruction occurring with the other two groups. For all three groups, experimentation and testing took place in the subjects' regular classrooms during their regular class hours.

Scoring Procedures. Both raw scores and gain scores were calculated for use in two different sets of statistical analyses (see below). Raw scores were calculated in the following way: with respect to the interpretation task, each correct response to the ten test items was given a score of one for a possible total of ten. Correct responses consisted of correctly matching the sentence heard to a drawing seen. Incorrect responses received a score of zero. Since the impact of instruction in a study of this kind is measured by an increase in knowledge gained, we decided to eliminate certain subjects from the beginning if they demonstrated a tendency to not use the word order strategy on the pretest. In other words, we decided to eliminate those subjects who had little to gain from such instruction. An arbitrary score of eight out of ten on the interpretation task was set. Anyone with eight or above on the pretest task for interpretation was eliminated from the study.

For the production task, raw scores were calculated by counting each correct response to the five test items. Responses were given a score of two points if the subjects produced a correct direct object clitic pronoun form in the correct position within the sentence. Responses were scored zero points if the subjects produced no clitic pronoun form at all (even if the sentence was correct by all other standards). For all those cases in between, a liberal scoring procedure was adopted. Responses were given a score of one point if the subjects produced either a correct direct object clitic pronoun form in the incorrect position, an incorrect clitic pronoun form in a correct position, or an incorrect clitic pronoun form in an incorrect position. The two, one, zero scoring procedure was done since an either/or scoring procedure would not reveal possible intermediate effects of instruction. That is, instruction could have had an impact on the learner's developing system but not necessarily resulting in native-like accuracy or use. Since there were five items with a possible score of two each, the production task was also worth ten points. As in the interpretation task, subjects were eliminated from the study if they scored eight points or above on the pretest.

Gain scores were calculated by comparing the

raw scores on each post-test with the raw scores on the pretest. Thus, there were three different gain scores for the interpretation test and three different gain scores for the production test.

Analysis. Raw scores were submitted to two separate one-way analyses of variance (ANOVA) with a repeated measures design. The first ANOVA was conducted on the interpretation data and the second on the production data. Gain scores on the interpretation test were submitted to three one-way ANOVAs, one for the gains measured in each post-test. Likewise, for the production task, the gain scores obtained for each of the three post-tests were submitted to three one-way ANOVAs.

In all cases, the independent variable was type of instruction, which consisted of three levels: traditional instruction, processing instruction and no instruction.

RESULTS & DISCUSSION

An ANOVA conducted on the pretests alone revealed no differences between the groups before instruction ($p = .79$ for interpretation task; and $p = .83$ for production task). We are thus confident that any comparative effects due to instruction are not related to prior knowledge or ability of any one group.

The ANOVA with repeated measures conducted on the raw scores of the interpretation tasks (see Table II) revealed a significant main effect for instruction ($p = .01$), a significant main effect for test (pre- vs. post-tests, with $p = .0001$), and a significant interaction between instruction and test ($p = .0001$). The results of the ANOVA are displayed graphically in Figure IV. A post-hoc Sheffé test revealed that the effect for instruction was due to the following contrasts: processing better than no instruction ($p = .0178$); processing better than traditional instruction ($p = .0369$); no significant

TABLE II
Mean Raw Scores for Interpretation Task

	No instruction	Traditional	Processing
Pretest	1.9	2.6	2.5
Post-test 1	4.5	4.6	9.4
Post-test 2	5.6	3.9	7.5
Post-test 3	4.2	6.0	8.8

Note: For this and all tables, scores are rounded off to one decimal place. Slight inconsistencies may thus appear as tables are compared.

FIGURE IV
Results of ANOVA with Repeated Measures Using Raw Scores on the Interpretation Test

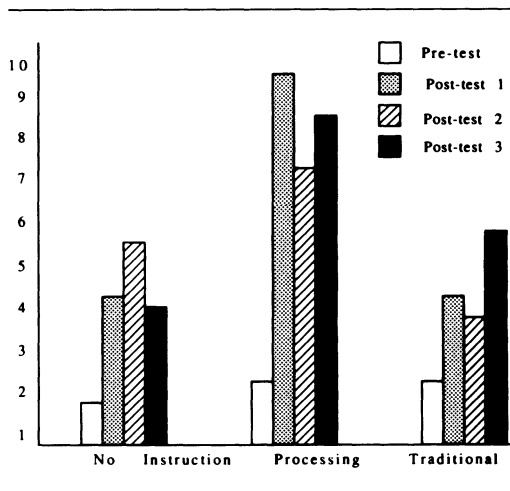


TABLE III
Mean Gain Scores on Interpretation Task

	No instruction	Traditional	Processing
Post-test 1	1.6	.8	5.5
Post-test 2	2.6	.4	4.4
Post-test 3	1.4	2.2	5.2

difference between traditional and no instruction ($p = .96$). In short, processing instruction was superior to the other two instructional types vis-à-vis the interpretation test.

The mean gain scores (interpretation task) for each group at each post-testing time are listed in Table III. For the first post-test, the ANOVA yielded a significant main effect for instruction ($p = .0001$). A Sheffé post-hoc test revealed that the effect was due to the mean gain scores of the processing instruction group being significantly different from those of no instruction ($p = .0001$), as well as being significantly different from the gain scores of the traditional group ($p = .0001$).

For the second post-test, the ANOVA yielded another main effect for instruction (again, $p = .0001$). A Sheffé post-hoc revealed that the effect was due to the scores of the processing instruction group being significantly different from those of the traditional instruction group

($p = .0001$). In addition, the scores of the no instruction group were significantly different from those of the traditional instruction group ($p = .02$).

For the third post-test, the ANOVA yielded another main effect for instruction ($p = .0002$). The Sheffé post-hoc revealed the same source of the effect as in the first post-test: processing instruction significantly different from no instruction ($p = .0004$), and processing instruction significantly different from traditional ($p = .0064$).

The answer to our first research question appears to be that processing instruction has some effect on the developing system of language learners of Spanish as far as using the system to make correct form-meaning connections during input processing. In addition, we can partially answer the third research question: some differential effect exists for processing instruction since traditional instruction apparently did little to improve learners' making form-meaning connections while processing input. In order to answer our second question and to completely answer the third, we now turn our attention to the results of the production task.

The ANOVA with repeated measures conducted on the raw scores of the production tasks (see Table IV) revealed a significant main effect for instruction ($p = .0119$), a significant main effect for test (pre- vs. post-tests, with $p = .0001$), and a significant interaction between instruction and test ($p = .0077$). ANOVA results are displayed graphically in Figure V. A post-hoc Sheffé test revealed that the effect for instruction was due to only one contrast: traditional better than no instruction ($p = .0167$). No significant differences between the processing and no instruction groups obtained, but more importantly, *the analysis did not yield any significant difference between processing instruction and traditional instruction*. In short, traditional instruction was not superior to pro-

TABLE IV
Mean Raw Scores for Production Task

	No instruction	Traditional	Processing
Pretest	2.1	3.6	1.8
Post-test 1	4.2	9.3	8.3
Post-test 2	4.2	7.9	8.0
Post-test 3	4.2	8.3	8.3

FIGURE V
Results of ANOVA with Repeated Measures Using Raw Scores on the Production Test

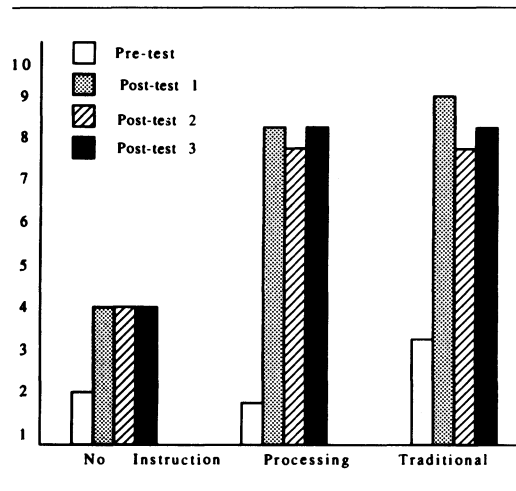


TABLE V
Mean Gain Scores on Production Task

	No instruction	Traditional	Processing
Post-test 1	2.1	5.6	6.7
Post-test 2	2.8	4.3	5.9
Post-test 3	2.1	4.7	6.1

cessing instruction on the production task, and on the second and third post-tests, the raw mean scores between these two groups were roughly the same.

As in the interpretation task, we also submitted gain scores on the production tasks to a statistical analysis. The mean gain scores on the production task based on all three post-test are given in Table V. The ANOVA on the first set of gain scores yielded a main effect for instruction. A post-hoc Sheffé revealed that the effect was due to the low scores of the no instruction group and not to any differences between traditional and processing instruction (traditional vs. no instruction, $p = .02$; processing vs. no instruction, $p = .004$; traditional vs. processing, $p = .74$).

For the gain scores based on the second post-test, the ANOVA did not yield any main effects ($p = .12$). A post-hoc Sheffé revealed that all comparisons were not significant.

For the gain scores based on the third post-test, the ANOVA yielded a significant main effect for instruction ($p = .03$) and the post-hoc Sheffé revealed that the effect was due entirely to processing instruction vs. no instruction ($p = .04$). No difference obtained for traditional vs. no instruction ($p = .17$) or for traditional vs. processing ($p = .68$).

Thus the answer to the second research question appears to be that processing instruction does have an effect on production, at least in the way that we tested production. Given the answer to this question, the answer to the third research question is that processing and traditional instruction apparently do not impact on the learner in the same manner. What appears to have happened in this study is that processing instruction altered the way in which the subjects processed input, which in turn had an effect on the developing system and what the subjects could access for production. The converse was the not the case for the subjects in the traditional group. That is, while traditional instruction apparently had an impact on what the subjects could access for production, it had little impact on how the subjects processed input. When compared to the no instruction group, the slight gains made over time by the subjects in the traditional group cannot be attributed to instruction.

DISCUSSION

The results reported in the previous section are, to say the least, interesting. While the processes depicted in Figures I and III help us to understand why processing instruction would have an effect on production, we have no explanation for why traditional instruction with output had little effect on interpretation. At this point, we see only two possible explanations. The first is that the subjects in the production group learned to perform the task but did not acquire any new language. However, this explanation is problematic. In order to perform a language task, one must have some kind of knowledge. That is, to produce a sentence, even in a mechanical sense, one must draw upon some knowledge source to put together that sentence. We believe therefore that another explanation is more tenable than the first; namely, that traditional grammar presentation and practice do not feed into the developing system directly but instead result in a different knowledge system. Krashen (20; 21) has suggested

that learners may develop two systems—an acquired competence and a learned competence—and has claimed that traditional instruction results in learned competence, but only by accessing comprehensible input can the acquired system build up. Likewise, Schwartz has suggested that the language module in the mind can only operate on primary linguistic data, and that explicit practice and negative evidence are not usable by the module. Explicit practice and negative evidence can result in what she calls LLK (“learned linguistic knowledge”), a system distinct from the underlying competence used by the language module. While Krashen and Schwartz may or may not agree with a focus on input as a teaching strategy, the data in our study do support their claims regarding acquisition.

An anonymous reviewer of this paper has suggested that we need not posit a dual knowledge system to explain the differential effects of instruction in the present study, that our results can be traced to the fact that the processing group received “more information” about Spanish than did the traditional group. Essentially, that is, in the traditional group, OVS sentences were not practiced, while in the processing group OVS sentences were part of the input and were “explained” during the presentation on object pronouns. Since the interpretation task consisted of OVS sentences, the processing group was favored. While this explanation is certainly possible, it seems unlikely. One would need to believe that the production practice of OV sentences in the traditional group and success in producing these strings on the production task did not carry over to interpretation of OVS sentences. In other words, one would have to believe that subjects in the traditional group could successfully interpret OV strings but not OVS strings. This assertion is counterintuitive and is not supported by previous research in which learners of Spanish interpreted OV and OVS sentences in the same manner (see 38 and 22). That is, regardless of whether a subject noun(phrase) follows a verb or not, learners of Spanish tend to process the object clitic pronouns as subject pronouns.

We should state that we are well aware of some of the methodological objections that could be raised regarding the study. One objection is that the interpretation task was similar to some of the activities in which the learners in the processing group engaged during in-

struction. It could be argued that the use of this task biased the outcome toward the processing group on the interpretation task. Recall, however, that the production task was added as a measure specifically against such a bias. Since at no time during instruction were subjects in the processing group asked to produce a single sentence in which either word order was non-SVO or contained a clitic object pronoun, we think that the overall results are striking. On a production task not related to interpretation, the processing group was as competent as, if not better than, the traditional group.

We now turn to a related potential objection to the study. While we may have shown that instruction in processing input transfers to production under controlled conditions, we have not shown that it transfers to production under more spontaneous circumstances. We acknowledge this objection, but offer the following argument. We did not set out to test whether or not instruction results in better communicative performance. We set out to ascertain whether or not instruction involving a focus on input processing resulted in similar or different effects compared to traditional instruction under normal classroom circumstances. We believe that we have accomplished this comparison. As part of a series of studies on this question, we will examine samples of spontaneous speech and writing gathered before and after instruction to see whether or not an effect of the two instructional types on more spontaneous performance can be found.

One last possible methodological objection to this study (and others like it) is that its essentially quantitative nature obscures possible qualitative differences on the production task. Given the scoring procedure of two points for a well formed sentence, one point for a variety of non-native-like sentences, and zero points for sentences that basically reveal no learning at all, the question could be raised whether or not the nonsignificant difference between the traditional and processing groups masks different types of output errors or production strategies. That is, one group could have a preponderance of twos and zeros while the other a slew of ones. In order to address this objection we conducted a multiple ANOVA using the number of twos, ones and zeros received by each subject in each instructional group as the dependent measure. The results did not yield any main effect; a post-hoc Sheffé test revealed no differences between any of the possible group comparisons. In addition, we looked at the pro-

duction sentences to see if the sentences scored as "one" were qualitatively different between the two groups. We could not discern any difference.

Our final comment concerns the linguistic item used in this study. Given that we define input processing as making form-meaning connections during comprehension and that the resultant connections are intake (i.e., are available for accommodation by the developing system), it can rightfully be asked: what of those items that carry no referential meaning? How do they figure into input processing? It is important to remember that SLA is more than just input processing. It consists also of those processes in Figure I that are labeled as II. Grammars accommodate new intake and restructure as part of their developing nature. We suggest that many non-meaning bearing forms and structures are first processed in the input as part of something that does carry meaning. These are then stored in the developing system until such a time when relevant data reveal to the learner that the items need to be segmented off or reanalyzed (29; 36). A detailed discussion of this is not possible here, but at present we do not see that non-meaning bearing items pose a problem for either the results obtained in the present study nor for continued research on the role of input processing in SLA and processing instruction itself.

CONCLUSION

In this paper we have attempted to make a connection between input processing and instruction. Given the role placed upon input in SLA, instruction as direct intervention on a learner's strategies in input processing should have a significant effect on the learner's developing system. Results of the present study support this claim. Furthermore, we have been able to show that instruction is apparently more beneficial when it is directed toward how learners perceive and process input rather than when instruction is focused on having learners practice the language via output. Learners who receive instruction that attempts to alter input processing receive a double bonus: better processing of input *and* knowledge that is apparently also available for production. The results are important, then, not only because of what they might contribute to the on-going discussion of the effects of instruction but also for the support that they give to input processing as a critical aspect of classroom SLA.

NOTES

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APPENDIX A

Sample Activities Used in Traditional Instruction

A. Directions: Imagine that you are in the following situations, performing the indicated tasks. A friend asks you about particular items. Answer logically. Follow the models.

1. *Ud está haciendo la maleta para un viaje a Acapulco.* (You are packing for a trip to Acapulco.)
¿El traje de baño? — ¡Claro que lo necesito! (The swimming-suit? Of course, I need it!)
Artículos: las sandalias, las gafas de sol, los pantalones cortos, las camisetas, etc. (Articles: sandals, sunglasses, shorts, T-shirts, etc.)

B. Directions: Rephrase sentences, changing direct object nouns to pronouns as needed.

1. *El camarero trae los vasos y pone los vasos en la mesa.* (The waiter brings the glasses and puts the glasses on the table.)
El camarero trae los vasos y los pone en la mesa.

APPENDIX B

Sample Activities Used in Processing Instruction

Actividad A. In the following, select the correct interpretation of the sentence. Keep in mind that Spanish has flexible word order and does not necessarily follow subject-verb-object order like English.

1. *Me llama frecuentemente mi hermana.*
 Who calls whom?
 a. I call my sister
 b. My sister calls me
2. *¿Te escriben los padres?*
 Who writes to whom?
 a. Do you write to your parents?
 b. Do your parents write to you?
3. *No nos escuchan los padres.*
 Who isn't listening to whom?
 a. Parents don't listen to us.
 b. We don't listen to parents.
4. *Me conocen bien mis hermanos.*
 Who knows whom well?
 a. My siblings know me.
 b. I know my siblings.

Actividad B. Listen to the speaker on the tape. Match each sentence you hear with one of the statements below.

1. A man is calling me.
I am calling a man.
2. My parents visit me.
I visit my parents.
3. I am pleasing to my family.
My family is pleasing to me.
4. We are greeting a friend.
A friend greets us.
5. Our relatives don't understand us.
We don't understand our relatives.

Actividad E. Each sentence corresponds to something that you might do to your parents. Check which

ones apply to you. Compare your responses with a classmate.

- _____ 1. *Los llamo con frecuencia por teléfono.*
- _____ 2. *Los visito los fines de semana.*
- _____ 3. *Los visito por los menos una vez al mes.*
- _____ 4. *Los abrazo cuando los veo (abrazar = to hug).*
- _____ 5. *Los comprendo muy bien.*
- _____ 6. *Los ignoro completamente.*
- _____ 7. *Los _____ ? _____.*

Did you notice that there are no explicit subject nouns or subject pronouns in each sentence? Since the *yo* form of the verb can only refer to *yo*, no subject pronoun is needed. All of the above sentences are of the simple word order object pronoun + verb.

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