Form and Meaning: Multiple Perspectives

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Printer: Odyssey Press, Inc.

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20 Park Plaza
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Berkshire House
168-173 High Holborn
London, WC1V 7AA, United Kingdom

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Thomson Learning
Calle Magallanes, 25
28015-Madrid
Espana

ISBN: 0-8384-0846-X

Printed in the United States of America
1 2 3 4 5 6 7 8 9 03 02 01 00 99

Processing Instruction as Form-Meaning Connections: Issues in Theory and Research

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Of recent interest in SLA literature is input processing. Input processing (IP) involves learner attention to form during on-line comprehension. The result of IP is intake, that set of form-meaning connections held in working memory and made available for further processing. The present paper reviews a set of principles related to how learners make form-meaning connections during IP and reconstructs the argument for the role of structured input in classroom SLA and the value of pushing learners' interpretation strategies in addition to their productive (expressive) strategies. The paper also addresses criticisms and misunderstandings of the role of structured input in instructed SLA and shows how certain positions on the role of output in classroom SLA are misinterpretations of the role of output in general SLA theory.

Introduction

Without a doubt, input has come to play a central role in second-language acquisition (SLA) theory since the mid-70s.[1] Larsen-Freeman and Long (1991) perhaps state it best when they say that "All cases of successful first- and second-language acquisition are characterized by the availability of comprehensible input" (p. 142). Whether one investigates SLA using UG, the Competition Model, connectionism, information processing, or some other framework, it is either assumed or stated that the basic data learners have for building some kind of mental representation of language is the input they are exposed to. It is also assumed or stated that the minimal characteristics of this input are that (1) it is meaning-bearing

(i.e., encodes a message that is intended for the learner to capture) and (2) it is somehow comprehensible.

Although input now occupies a fundamental role in SLA, only recently has input processing emerged as an aspect of SLA deserving of scholarly attention (VanPatten 1995, 1996). It is common knowledge in SLA circles that not all of input becomes intake; if this were true, acquisition might well be instantaneous. Thus, those working within IP as a field of inquiry ask the fundamental questions "How do learners make form-meaning connections during on-line comprehension?" and "What psycholinguistic strategies or mechanisms guide the processing of input?" If we conceive of the term "intake" as those data that result from some kind of linguistic processing of the input, then input processing is concerned with how learners derive intake from the input.

The purpose of the present paper is three-part. The first is to review the nature of input processing using a model developed in a series of previous publications (VanPatten 1984, 1985, 1990, 1995, 1996). The model will not be reviewed in detail, but particular aspects will receive special attention as we address the question of form-meaning relationships and the development of a linguistic system in the learner's mind. The second is to review a type of focus on form that uses input processing as its theoretical framework. This type of focus on form is called *processing instruction.* The final purpose is to address a set of criticisms directed at processing instruction and to argue that these criticisms, as currently formulated, are invalid.

Theoretical Background: Input Processing

As stated in the introduction, input processing (IP) is concerned with those psycholinguistic strategies and mechanisms by which learners derive intake from input. As such, IP attempts to explain how learners get form from input while their primary attention is on meaning. *Form* is defined as "surface features of language" (e.g., functors, inflections), although IP is also relevant to syntax (i.e., sentential word order). In VanPatten (1996) the most complete model of IP is presented. This model consists of a set of principles and corollaries that interact in complex ways in working memory. It is important to point out the role of working memory in this model since the first two principles are predicated on a limited capacity for processing information. Learners can do only so

Table 1
Principles of Input Processing

P1.	Learners process input for meaning before they process it for form.
	P1a. Learners process content words in the input before anything else.
	P1b. Learners prefer processing lexical items to grammatical items (e.g., morphology) for the same semantic information.
	P1c. Learners prefer processing "more meaningful" morphology before "less" or "nonmeaningful" morphology.
P2.	For learners to process form that is not meaningful, they must be able to process informational or communicative content at no (or little) cost to attention.
P3.	Learners possess a default strategy that assigns the role of agent (or subject) to the first noun (phrase) they encounter in a sentence/utterance. This is called the first noun strategy.
	P3a. The first noun strategy may be overridden by lexical semantics and event probabilities.
	P3b. Learners will adopt other processing strategies for grammatical role assignment only after their developing system has incorporated other cues (e.g., case marking, acoustic stress).
P4.	Learners first process elements in sentence/utterance initial position best.
	P4a. Learners process elements in final position before elements in medial position.

Source: Based on VanPatten (1996).

much in their working memory before attentional resources are depleted and working memory is forced to dump information to make room for more (incoming) information. The principles are listed in Table 1.

That learners are driven to get meaning from input (P1) has a set of consequences, the first being that words (content lexical items) are searched out first since, at least in the learner's mind— if not in any fluent speaker-listener's—words are the principal source of referential meaning (P1a). Of importance for the acquisition of grammatical form, then, is principle P1b. This principle holds that when content lexical items and a grammatical form both encode the same meaning and when both are present in a sentence/utterance, it is the lexical item and not the grammatical form that learners attend to for the meaning. Following are examples from Spanish:

a. *Ayer mis padres me llamaron para decirme algo importante.* Here, both the lexical item *ayer* and the verb inflection *-aron* encode pastness. The learner does not have to

allocate attentional resources to a verb form to grasp that the action took place before the present. At the same time, *mis padres* as well as *-aron* encode plurality; again the learner does not have to allocate attentional resources to an inflection to know that the subject is plural.

b. *No creo que comprenda Ramón lo que dice el profesor.* In this example, both *no creo* and the *-a* of *comprenda* are related to mood (what textbooks call "the subjunctive of doubt" and what linguists might call "nonaffirmation"). The presence of *No creo* mitigates against the processing of the *-a* since the latter adds to the sentence no information that the learner cannot get from the former. (We will not repeat here the subject-verb agreement processing problem explicated earlier.)

c. *Dicen que Julieta está enferma y que no viene a clase.* In this example, the presence of *enferma* and the context of not coming to class will give the learner the concept of perfection ("temporariness" in layperson's terms) and mitigate against the processing of *está.* Likewise, it is *Julieta* from which the learner gets gender and not from the *-a* of *enferma.*

What these examples help to illustrate is that a great deal of form that is meaning-oriented (i.e., is related to some semantic concept in the real world—what I call referential meaning) may also be expressed by a lexical item or phrase elsewhere in the sentence or the discourse. This observation led VanPatten (1985) to posit the construct *communicative value.* Communicative value refers to the meaning that a form contributes to overall sentence meaning and is based on two features: [± inherent semantic value] and [± redundancy]. A given form can have [+ semantic value and – redundancy], [+ semantic value and + redundancy], [– semantic value and + redundancy], and finally [– semantic value and – redundancy]. In general, a form's communicative value is greater if it has the characteristics [+ semantic value/– redundancy] than if it has the characteristics [+ semantic value/+ redundancy]. In short, if meaning can be retrieved elsewhere and not just from the form itself, then the communicative value of the form is diminished. Forms with [– semantic value], regardless of redundancy, contain no communicative value. In the earlier examples a–c, the preterit inflection *-aron*, the subjunctive marker *-a*, and the copular

verb *está* are all [+ redundant] in that their semantic value is present lexically somewhere else. One should note, however, that redundancy is not absolute; the preterit (or any other tense marker) does not always co-occur with a temporal expression in an utterance. In the input one might also hear utterances such as *¿Dónde estudiaste?* (Where did you study?) in which no lexical item provides clues to tense (or to person/number). However, one rarely hears the subjunctive without a main clause that triggers it, and one rarely hears copular verbs without a predicate of some kind. In short, some forms are more redundant than others.

The nature of communicative value, then, is important for input processing: The more a form has communicative value, the more likely it is to get processed and made available in the intake data for acquisition (P1c). Pity the poor form that has no, or consistently little, communicative value; it is the least likely to get processed and, without help, may never get acquired. In nonclassroom contexts (and even with many classroom learners), the absence of such forms in learner speech indicates that the learner has perhaps not processed them in the input. Of course, frequency in the input and other aspects of language may be factors that along with communicative value may doom a form never to get picked up by a learner. Likewise, the intersection of high communicative value and frequency may have a favorable effect on acquisition.

Input processing is also concerned with word order. P3, the first noun strategy, may have important effects on the acquisition of a language that does not follow strict SVO word order. In each of the following sentences in Spanish, the first noun-phrase the learner encounters is not a subject, but the learner may very well attempt to encode it as such:

d. *A Juan no le gusta esta clase mucho.* (John does not like this class much.)

e. *La vi yo en la fiesta anoche.* (I saw her at the party last night.)

f. *Se levanta temprano.* (He/She gets up early.)

g. *Nos faltan varios libros.* (We are missing several books.)

Research has shown that learners do indeed encode such pronouns and noun-phrases as subjects (e.g., *Juan* is the subject of d, *la* is the subject of e and means "she"), thus delivering erroneous intake to their developing linguistic systems. In this case, it is not that meaning is gotten elsewhere; it is that meaning is not gotten at all or is gotten wrong.

Research by Barcroft and VanPatten (1997) as well as Rosa and O'Neill (1998) has led to another important processing principle, that of position in the utterance. From P4 it is clear that learners perceive and process items in one position better than another. This means, for example, that learners are much more likely to pick up question words and their syntax than, say, object pronouns or the subjunctive. Learners may not need to be told that Spanish inverts subject and verb in yes/no questions because this is immediately evident in simple questions that learners hear from the first day of exposure (i.e., the verb is in initial position, the most salient). This kind of intake data may be important for UG-related aspects of acquisition such as verb-movement, discussion that is taken up in detail elsewhere (VanPatten 1996, Chapter 5) and is beyond the scope of the present paper.

To summarize, research on IP attempts to describe which linguistic data in the input get attended to during comprehension and which do not (or which are privileged and which are not) and which grammatical roles learners assign to nouns. Intake is that subset of filtered input that the learner actually processes and holds in working memory during on-line comprehension. Intake is thus grammatical information as it relates to the meaning that learners have comprehended (or think they have comprehended). To be sure, IP is but one set of processes related to acquisition; that learners derive some kind of intake from the input does mean that the data contained in the intake automatically make their way into the developing mental representation of the L2 in the learner's head (i.e., intake ≠ acquisition). In previous work (VanPatten 1996), accommodation of intake and restructuring are seen as processes separate from IP. In addition, how learners access their developing system to make output is also a distinct set of processes. (For detailed discussion see VanPatten 1996, Chapters 2 and 5, and the references contained therein.)

Future research will no doubt add to the current model of IP or push for alterations in it—and the presentation of the model in this chapter has been necessarily brief and without details. Nonetheless, the sketch provided here is sufficient for discussion concerning classroom SLA and a focus on form, the subject of the next section of this paper.

Processing Instruction: A Description

If it is the case that learners' input processing may lead to less grammatically rich input than previously thought, a logical question arises: Is there

a way to enrich learners' intake using insights from IP? Another way to ask this question is To what degree we can either manipulate learner attention during IP and/or manipulate input data so that more and better form-meaning connections are made? In a series of studies, we have investigated this question by examining the possible benefits of what is called processing instruction (Cadierno 1995; Cheng 1995; Pereira 1996; VanPatten and Cadierno 1993a, 1993b; VanPatten and Oikennon 1996; VanPatten and Sanz 1995). Processing instruction (PI) is a type of grammar instruction with three basic characteristics:

1. Learners are given information about a linguistic structure or form.
2. Learners are informed about a particular IP strategy that may negatively affect their picking up of the form/structure during comprehension.
3. Learners are pushed to process the form/structure during activities with structured input—input that is manipulated in particular ways so that learners become dependent on form and structure to get meaning and/or to privilege the form/structure in the input so that learners have a better chance of attending to it (i.e., learners are pulled away from their natural processing tendencies toward more optimal tendencies).

Characteristics 1–3 can be exemplified in the case of the preterit tense. We know from principle P1b that learners prefer to process lexical items to grammatical items when both encode the same meaning. In the case of the preterit tense, learners naturally rely on temporal expressions such as *yesterday, last week, when I was in high school,* and so on, not on verbal inflections as cues to pastness. Knowing this, a PI supplemental lesson on preterit would first begin with a brief explanation of what the preterit tense looks like. Ideally, we would break the explanation into parts so that learners are focusing on one form at a time in the input (thus the lesson on preterit would consist of several subsections). Following this, learners would be told that it is natural to skip over verb forms when listening or reading and that people tend to rely on other cues to get pastness. They would then be told that this is not the best strategy for picking up verb forms and that in the activities that follow they will be pushed to attend to verb forms for cues about present, past, and future. Subsequently they would work through written and aural activities in which temporal expressions are removed and the verb is the sole bearer of pastness. These activities are called *structured input activities.* Here are two examples:

Example A

Listen to the statements your instructor makes. Is the action expressed in the present, past, or future?

[INSTRUCTOR'S SCRIPT: 1. *Juan habló con sus padres por teléfono.* 2. *Maria estudia mucho para los exámenes, etc.* Translation: 1. John talked with his parents on the phone. 2. Mary studies a lot for her exams.]

Example B

Listen to each sentence your instructor reads. Which of the expressions listed could be included in the sentence?

1. a. *anoche*	b. *ahora*	c. *mañana*
2. a. *en este momento*	b. *la semana pasada*	c. *en dos minutos*

[INSTRUCTOR'S SCRIPT: 1. *Juan no llamó.* 2. *¿Qué hace María?*, etc.]

These examples are called *referential* structured input activities. Referential activities are those for which there is a right or wrong answer and for which the learner must rely on the targeted grammatical form to get meaning (in this case, broad temporal reference). Normally, a sequence of structured input activities would begin with two or three referential activities.

Following referential activities, learners are engaged in *affective* structured input activities. These are activities in which learners express an opinion, belief, or some other affective response and are engaged in processing information about the real world. Following is an example of an affective activity that could follow the earlier referential activities:

Example C

Step 1. Following is a list of things your instructor might have done last night. Check off those that you think he/she did and then put them in chronological order.

Our instructor . . .

___ had a cocktail.
___ read the newspaper.
___ walked the dog.
___ prepared dinner.
___ watched TV.
___ went out with a friend.
___ called a student.

___ slept for eight hours.
___ exercised.
___ cleaned a closet.

Step 2. A volunteer will read the statements from step 1 to the rest of the class; everyone else should express agreement or disagreement. In the end, your instructor will tell you and the class if you are right.

Note that learners respond to the input in step 1 and that in step 2 they are still working with the input by reading it aloud and/or listening to someone else who is reading it aloud. Focus is on both form and meaning at the same time.

The sequence would, for example in Spanish, repeat itself four or five times in order to treat all forms of the verb (i.e., first person singular, second person singular, and so on). Each time explanations would be kept simple since only one form is in focus. (An additional sample using the subjunctive in Spanish is provided in the appendix.) This brings us to a set of working guidelines developed in Lee and VanPatten (1995) to help instructors create their own structured input activities.

1. *One thing at a time.* This guideline means that only one form and one function should be in focus in any given activity and in any short sequence of activities. For example, in the two referential activities followed by the affective activity, only the third person singular was in focus for the simple past to talk about isolated one-time events.
2. *Keep meaning in focus.* Unlike traditional instruction that includes a role for mechanical drilling, all structured input activities include (1) the meaning of the form has to be processed or (2) the propositional meaning of the sentence and the form have to be processed. Circling verb forms in a passage, for example, does not focus on meaning and does not constitute a structured input activity.
3. *Move from sentence to discourse.* Learners are much more likely to attend to form if they begin with sentences (and the shorter the better) than if they begin with narrative or descriptive discourse. This guideline suggests that when focused on form, lessons should always begin with sentence-level activities.

4. *Learners must do something with the input.* Learners cannot be passive listeners or readers of structured input. They must demonstrate that they are paying attention by checking boxes, indicating *yes/no*, supplying a word, and so on.

5. *Use both oral and written input.* Since some learners are visually oriented and written material helps them to hear better, activities should include both oral and written input either across the activities or within each.

6. *Keep the learners' processing strategies in mind.* This means that each activity and each input sentence must be structured to push learners away from their natural processing strategies. For example, inclusion of adverbs in the past tense lesson sketched above would detract learners from attending to the form.

It is important to note that PI is not just another comprehension-based approach to language instruction such as TPR or immersion; PI is a focus on form that serves as a supplement to existing communicative and acquisition-oriented approaches, including comprehension-based approaches such as TPR, the Natural Approach, and immersion. In short, comprehension-based approaches can live with or without PI, but PI is not intended to exist on its own. Since the point of PI is to assist the learner in making form-meaning connections during input processing, it is more appropriate to view it as a type of focus on form or input-enhancement (Sharwood Smith 1993).

Issues in Theory and Research

Since the publication of VanPatten and Cadierno (1993b), criticisms and counterevidence have appeared regarding PI (e.g., Collentine 1998; DeKeyser and Sokalski 1995; Ellis 1994; Salaberry 1997; Toth 1997). Following are four major issues that emerge in these and other publications: (1) that PI is not grounded in any theory; (2) that PI has been tested with simple rules and structures; (3) that there are methodological problems with treatment in the PI studies; and (4) that PI discounts the role of output in SLA. We will examine each criticism in detail and then end with a brief discussion of research methodology.

One criticism that has been made regarding PI is that it is not theoretically grounded. Salaberry (1997), for example, states that "there is no theoretical or empirical support" (p. 425) for PI. In criticizing the VanPatten and Cadierno (1993b) study, Salaberry uses as a point of departure the criticisms of Krashen's Monitor Theory and argues that, if Krashen is wrong, then VanPatten and Cadierno must be wrong as well. However, one need not be supportive of Krashen's Monitor Theory to be supportive of PI or any other input-oriented focus on form (see, for example, Gass 1997; Jordens 1996; Sharwood Smith 1993; and others). The question is whether one believes in the fundamental role of input in SLA, which VanPatten and Cadierno (1993a, 1993b) clearly do (and as the vast majority of scholars in SLA do). For example, in the recent volume edited by Doughty and Williams (1998), all contributors either explicitly or implicitly attribute a fundamental role in acquisition to input. And Gass (1997) begins her book with "The concept of input is perhaps the single most important concept of second language acquisition" (p. 1). Again, the position is that successful acquisition cannot happen without input.

As a focus on form, PI is not grounded in Monitor Theory but in *the psycholinguistics of sentence processing and form processing during comprehension.* That is, PI takes as its point of departure a model of input processing and how learners do or do not make form-meaning connections during on-line comprehension. In terms of its theoretical underpinnings, PI has been reviewed by a number of other scholars (Ellis 1998; Jordens 1996; Skehan 1998) who have made the opposite conclusion of Salaberry (1997), namely, that PI is a type of grammar instruction or focus-on-form that is grounded in contemporary cognition and psycholinguistics. That PI is grounded in a model of input processing has escaped a number of researchers attempting to do replicative work. These studies equate PI with mere exposure to structures in input, and the treatments used in them do not systematically push learners to alter their processing strategies (i.e., they do not push learners to make better and more correct form-meaning mappings). (See, for example, Kubota 1996; Nagata 1995; Salaberry 1997; Toth 1997.) Part of the problem in replication studies of PI, as discussed in Sanz and VanPatten (1998), is that a number of researchers have reduced the complexity of PI to mere comprehension and either explicitly or implicitly claim that the original VanPatten and Cadierno research was "comprehension versus production" (see, for example, the title of Nagata's 1995 replication study, "Production Versus

Comprehension Practice in Second Language Acquisition"). And in these so-called replication studies, there is no explicit or even implicit psycholinguistic purpose in the input-oriented activities the researchers developed. Collentine (1998) comes closest to creating PI. However, his materials, too, fall short of true PI, and he even (erroneously) states that the focus of his research, the subjunctive, does not lend itself to PI. As our appendix (as well as the work of Pereira 1996 and work in progress by Farley) shows, all uses of the subjunctive can be taught via PI. In short, it is not clear at all that other researchers systematically attempted to overcome a nonproductive input processing strategy via their intended replication of PI.

In VanPatten and Cadierno (1993a, 1993b), we researched PI versus *traditional* foreign language instruction, defined as explanation plus output practice that moves learners from mechanical to communicative drills. Because we do not argue against other types of output activities, especially those that encourage interaction such as task-based instruction, the general conclusion we reached is still tenable: *Traditional* instruction (which, by nature, is *at the surface* output-oriented) is not as good as PI in assisting learners in the creation of form-meaning relationships useful for acquisition.

A second criticism of PI is that it has been researched using easy structures. DeKeyser and Sokalski (1995), for example, argue that clitic object pronouns and word order in Spanish as used in VanPatten and Cadierno (1993a) are simple structures and may have influenced our results. DeKeyser and Sokalski state, "This element of morphosyntax [clitic objects and placement] is simple to produce, yet difficult (for English speakers) to comprehend" (p. 621). Their reasoning is that the structure encodes an "obvious" agent/patient relationship and that the word-order rules are simple. (It is not clear to me why production and comprehension would differ.) This reasoning contrasts with data from spontaneous speech collected by Malcolm Johnston (personal communication) who uses Pienemann's Processability Theory to account for learner output (Pienemann 1998). Use of object clitics is a late(r)-acquired feature in this model and in the data provided by Johnston. Previously published data, again gathered from communicative tasks and spontaneous speech, support the idea that use of clitics and their placement is not as easy as DeKeyser and Sokalski claim (see, for example, Andersen 1983 and VanPatten 1987).

At a theoretical level, however, there is more to complexity than formal features. Complexity in acquisition may have more to do with *processing* of language (either input or output) than surface formal features do. This is clearly pointed out by de Graaff (1997) and Pienemann (1998). From a production perspective, Pienemann argues that complexity in processing is due to increased demands on linguistic operations performed during on-line production. Stockwell, Bowen, and Martin (1965), for example, point out that adjective agreement in Spanish is not formally or semantically complex at all but that fluent nonnative speakers make errors with this structure more often than we might expect. Pienemann would account for this in that adjective agreement stretches across node boundaries in an utterance and that the simplest agreement would be NP internal (*la casa blanca* "the white house") and the most difficult would be across clause boundaries (*¿Como se llama la mujer que dicen que es antipática?* "What's the name of the woman who they say is not very nice?"). Within Pienemann's framework, one way in which processing complexity increases is when linguistic information must be held outside of its immediate constituent for use later in the utterance.

The point to be made here is that clitic object pronouns are complex in terms of processing, both for input and output (albeit for different reasons). What is more, since VanPatten and Cadierno (1993b) published their study, there has been research on inflectional structures (the preterit tense in Spanish), lexical-semantic structures (the contrasting copular verbs in Spanish), and clause-dependent mood (the subjunctive in Spanish). In each case, PI is found to have a positive effect on learner performance. Given the variety of structures used and their notorious difficulty for learners of Spanish (at least for L1 English speakers), complexity of structure does not appear to be an issue that affects the validity of studies on PI.

A third major criticism of PI concerns the actual treatment used in the studies and how it compares with other treatments. Ellis (1998), DeKeyser and Sokalski (1995), and others have suggested that the kind of instruction contrasted with PI (namely traditional instruction) and PI itself are too different to allow for conclusions about the relative efficacy of PI. These scholars point out that in the studies in which TI and PI are contrasted, PI provides more information to subjects, and TI involves less focus on meaning compared with PI. As for PI providing more information to subjects, pushing learners to process for form in the input suggests that certain information be provided. First, learners should be told about their

processing strategies and that they are not optimal for acquisition. Second, linguistic information is provided that displays the meaning contrasts that the PI is attempting to get learners to process when exposed to the input. This type of information is not provided in TI, an instructional mode that tends to provide learners only with paradigms and lists of rules or guides for usage. The criticism that PI provides more information than does TI stems largely, I believe, from the misconception that studies on PI are simply about comprehension versus production. If it were the case that all we (VanPatten and Cadierno 1993a, 1993b) were interested in was comprehension versus production, then indeed information would have to be held constant to assess the relative contribution of these two skills. However, PI is not about comprehension alone, and the original studies were not about comprehension versus production; they were about PI and TI.

Traditional instruction is what it is; it can be found in most contemporary foreign language textbooks and can be observed in a great number of language classrooms across the country. PI is relatively new, and we needed to work out the specifics of what it might be like to apply the model of input processing to instructional concerns. It is what it now is. In short, as a series of studies in which PI and TI are contrasted, there is no problem in terms of treatment. It is worth noting, however, that as one possible answer to the criticism of treatment, VanPatten and Oikennon (1996) presented the findings of a partial replication of VanPatten and Cadierno (1993b) in which all explicit information was removed from one PI group (i.e., it received structured input only). The findings suggest that even without the "extra information" provided by PI, learners made significant gains in performance across two measures, suggesting that while possibly useful, the explicit and "extra" information was not necessary. Carefully structured input activities may be enough to push learners to make more and better form-meaning mappings.

Regarding the criticism that PI is more meaning-oriented than TI, again, this is the nature of the two instructional treatments and had to be built into the original VanPatten and Cadierno (1993b) study. TI historically contains mechanical activities, and these activities abound in contemporary foreign language textbooks. Because PI is about making form-meaning connections during intake derivation, it has to be concerned with meaning from the very beginning. Again, the criticism about meaning-orientation may largely be due to the misconception that we are equating PI with comprehension and TI with production.

The fourth criticism of PI centers on the role of output. Because our work has been misinterpreted as input versus output, some scholars have claimed that PI either discounts output altogether or minimizes its role. To clarify my and my coauthors' thoughts on output, I would like to quote from our publications:

> *. . . we feel that, in addition to the fluid and "freer" interaction that often happens in communicative classrooms, it is important for instructors to also develop focused output activities that encourage learners to be accurate while also attending to meaning (VanPatten and Cadierno 1993b, p. 239).*

> *While input is* necessary *for creating a system, input is not* sufficient *for developing the ability to use language in a communicative context . . . Production of the foreign language (be it writing or speaking) involves those processes that operate at point III [in VanPatten's sketch of second-language acquisition and use]. These processes include access (retrieval of correct forms), monitoring (editing one's speech when one realizes "something is wrong"), and production strategies (stringing forms and words together to make sentences) and are affected by a variety of factors (Lee and VanPatten 1995, p. 117, emphasis original).*

> *. . . in order to bring communication (expression, interpretation, and negotiation of meaning) into the classroom, instructors will have to look to something other than form-focused activities. Instructors need to go beyond drills to provide the opportunities learners need to develop communicative language proficiency (Lee and VanPatten 1995, p. 156).*

> *[I am] not advocating that processing instruction occupy all of instructors' and learners' time to the exclusion of interaction, reading, and other components of a communicative approach . . . we also need to ask ourselves questions of a much more practical nature: Can and should processing instruction occur outside the classroom? Because processing instruction is input-based, can computers deliver effective processing instruction (VanPatten 1996, p. 158)?*

These statements clearly show that PI is not at odds with output; PI is one type of focus-on-form available to instructors whose classes are

communicative in nature (Doughty and Williams 1998, Chapter 10). It might be that researchers who have focused on output and interaction suggest something contrary to the model of input processing as well as PI. Following are quotes from two such scholars:

> *If what is crucial about interaction is the fact that input becomes salient in some way (i.e., enhanced), then it matters little how salience comes about—whether through a teachers' self-modification, one's own request for clarification, or observation of another's request for clarification. The crucial point is that input becomes available for attentional resources and attention is focused on a particular form or meaning. When learners are in an interactive mode, they can focus on what is necessary for them—that is, their own attention can drive the interaction (Gass 1997, p. 129).*
>
> *The claim is not that negotiation causes learning nor that there is a theory of learning based on interaction. Rather, negotiation is a facilitator of learning . . . it is one means by which input can become comprehensible and manageable (Gass 1997, p. 132).*
>
> *I have hypothesized that, under certain circumstances, output promotes noticing. This is important if there is a basis to the claim that noticing a form in input must occur in order for it to be acquired (Swain 1998, p. 66).*
>
> *Thus, learners may use their output as a way of trying out new language forms and structures as they stretch their interlanguage to meet communicative needs; they may use output just to see what works and what does not (Swain 1998, p. 68).*
>
> *. . . by encouraging metatalk among second and foreign language students, we may be helping students to make use of second language acquisition processes. That is, metatalk may be one pedagogical means by which we can ensure that other language acquisition processes operate. It is essential, however, that this metatalk is encouraged in contexts where the learners are engaged in "making meaning," that is, where the language being used and reflected upon through metatalk is serving a communicative function (Swain 1998, p. 69).*

I see no contradiction, either in theory or in practice, between the comments made by Gass (1997) and Swain (1998) and those made by me and

my colleagues. Both Gass and Swain clearly state that one function (perhaps the major one) of making output and interacting in the second or foreign language is that it may push the learner to attend to input. Attention to input is what PI is about. Swain clearly states that output is necessary for stretching the communicative limits of one's interlanguage; Lee and VanPatten (1995, Chapter 8) would not argue with this at all. Swain also states that metatalk, as a result of making output during interaction, may promote processes necessary for acquisition. One such process may very well be to relate a meaning to form so that when it is encountered in the input, the form has a better chance of being processed to form part of a learner's intake.

My reading of those who criticize PI for its lack of attention to output is that they misinterpret and/or misapply the current literature on output and interaction as exemplified in Gass' and Swain's comments. DeKeyser and Sokalski (1995), for example, state, "In more recent years *production practice* has been advocated most strongly by Merrill Swain . . ." (p. 615). My concern here is the use of the term "production practice," a term that sounds very much like noncontextualized sentence-level production activities. DeKeyser and Sokalski may or may not have intended this meaning, but this is the way they operationalized output in their study. To cite Merrill Swain (1998) to support "production practice" is misleading. In her 1985 and subsequent publications, Swain clearly couches output within negotiated interactions, interactions in which learners are pushed to be more precise in their communication. Swain may believe that focused production practice is good; she also may not. The point here is that her now well-known "output hypothesis" is not about mere practice but about creation of meaning and its delivery during face-to-face interaction.

In an interesting study that attempts to research the output hypothesis directly, Bigelow, Fearnow, Fujiwara, and Isumi (1997) had subjects in an experimental group underline conditional forms in input passages and then subsequently produce language during tasks in which conditional forms could be used. A control group underlined conditional forms in the input passages, but instead of production, they answered comprehension questions on the passage. The researchers hypothesized that the experimental group would notice more conditional forms in the input passages, would incorporate more conditional forms in their output, and would show greater accuracy with the conditional. Their first hypothesis was not confirmed (the control group noticed just as many forms), and the

second and third hypotheses were only partially confirmed (effects did not last over a two-phase period of study). Although this study is intriguing for a variety of reasons, I would again like to draw attention to how the output hypothesis is realized in an experimental study. Bigelow et al. had their subjects retell the input passages in writing during the different phases of the study; that is, first subjects read and underlined forms, then they retold (via written narrative) the passage they had just read. This was done twice. Again we are faced with output being operationalized as something different from what Swain (and Gass, for that matter) describes in her work. As I understand it, pushed output and any type of noticing of form happen during real-time interaction and are controlled by the learner to a certain degree. During interaction, the learner produces language that may be incorrect and from some sort of interactional signal may notice that the other person creates the same meaning but with different language.

Before concluding, I would like to be clear on one point: I have countered the criticisms and research of a number of persons in this section—this does not mean that their research or studies are faulty. Indeed, I have found the works of DeKeyser, Salaberry, Toth, and others stimulating and their results interesting. My point here is that their findings vis-à-vis PI can be explained and interpreted not due to problems with PI, but instead how they perceive PI and its intended potential effect(s) on acquisition as well as how they interpret the work on output.

If there is one criticism that is certainly valid, it is the same for all studies on focus-on-form; namely, that we have yet to see any durability with PI. The longest stretch between PI and a testing session in any of our studies has been one month. Currently, we are investigating the durability of PI with a year-long study and will report on that at a later date.

Issues Relating to Language Program Direction

It may not immediately be clear just how the issues presented earlier relate to language program direction. One area of possible application is this: If scholars and other researchers have certain misinterpretations about PI, what ideas do teaching assistants walk away with when presented with novel concepts, such as processing instruction? Recently I have been involved in putting together a videotape for teacher training.

One of the areas I wanted to cover was structured input and how it is used in the classroom. As part of the project, I have been watching videotaped classrooms in Spanish basic language. Two things in particular have struck me. The first is that some teaching assistants spend a great deal of time explaining grammar concepts that they don't need to. Recall that in PI, explicit information is minimized by the "one thing at a time" principle. One simply doesn't need to explain much, and the VanPatten and Oikennon (1996) study showed that it is structured input that pushes learners to make form-meaning connections; explicit information adds little or nothing to the process.

The second thing that I have noticed is that some teaching assistants actually make the students repeat sentences in structured input activities; students are not allowed to say "I agree" or "I disagree" or "The answer is a." Some teaching assistants make them say the sentence aloud for practice, as explained to me by one assistant when I queried him on the technique. Recall that during structured input activities learners are supposed to be engaged in processing form-meaning connections while listening to and/or reading sentences.

There is nothing terribly wrong with the two practices just described, but what is interesting is how some teaching assistants cannot simply learn a new technique or approach: *They appear to need to blend old with new.* In the examples, they have imported lengthy explanations and repetition from previous experience with more traditional approaches to grammar into PI. For those language program directors who are attempting to implement PI in basic language courses, caution is warranted when it comes to making the leap from theory to practice.

Conclusion

In this paper, I have reviewed both input processing and processing instruction as they relate to the concept of form and meaning. Input processing is concerned with strategies for attaching meaning to form during on-line comprehension; processing instruction is concerned with pushing learners to make better and more form-meaning connections during comprehension. I also reviewed four general criticisms of processing instruction and argued that the criticisms were without merit. I argued that, contrary to these criticisms, (1) processing instruction is theoretically grounded; (2) it has been researched on a variety of difficult structures; (3) the studies on processing instruction were not investigating input

versus output but rather processing instruction versus traditional instruction; and (4) there is nothing incompatible with the role of output in SLA and input processing or processing instruction. I also briefly touched upon issues related to language program direction and the implementation of PI.

As we await further research on the effects of PI, we can continue to work within the model of input processing developed in VanPatten (e.g., 1996). This model is the first to attempt to answer the question "What form-meaning connections are made under what conditions?" and to link on-line comprehension to acquisition (the accommodation of intake and the restructuring of the developing system). Given the focus of the present volume, we should continue with the theoretical and descriptive research on input processing. An interesting and promising avenue to pursue would be parsing. The question here is "What type of structural tree does the learner's processing mechanism assign to input strings?" Given that form and meaning may be the foundation upon which syntax eventually emerges, parsing and its relationship to meaning and intake data may prove to be useful to SLA theory in general.

Note

1. I would like to thank Joe Barcroft, Cristina Sanz, James F. Lee, and Albert Valdman for feedback on an earlier version of this chapter. The usual caveat applies.

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Appendix

"Today we are going to learn a new verb form called the *subjunctive.* It is used in various kinds of sentences, but today we are going to focus on expressing doubt and disbelief. How would you say in Spanish that you believed the following statement?

Juan visita a sus padres con frecuencia.

You could say *Creo que Juan visita a sus padres con frecuencia.* Now suppose you wanted to say that you didn't believe it or that you doubted it. You would say something like

No creo que Juan visite a sus padres con frecuencia.
Dudo que Juan visite a sus padres con frecuencia.

Did you notice that the verb *visite* ends in *e* rather than *a*? This is the subjunctive form, and it must be used in all sentences with *dudar que, no creer que*, and other expressions. To talk about someone else, you would use a form that ends in *e* if the verb is *ar* and *a* if the verb is *er* or *ir.* As you will see in the activities that follow, the stem of the subjunctive is not the same as for the present tense indicative—what you use to talk about your daily routines and other typical events. The subjunctive stem is based on the *yo* form of the present indicative. Can you recognize the verbs for the following subjunctive forms?

conozca	*tenga*	*tome*
salga	*viva*	*almuerce*

A few irregular forms you will see in the activities that follow are *sea* (from *ser*), *vaya* (from *ir*) and *haya* (from *haber*).

One of the difficulties in acquiring the subjunctive is that you may not hear it or pay attention to it. While we talk about the subjunctive of doubt and disbelief, most learners of Spanish pay attention to phrases such as *no creo que* and *dudo que* since the subjunctive form is redundant. You will have to learn to pay attention to the verb form as you encounter it; the activities that follow will help you to begin to do so.

Activity A

Listen carefully to the sentence fragment that your instructor says. Then select the only phrase that could have introduced that sentence fragment. All sentences are about the typical professor at your university.

1. a. *Creo*	b. *No creo*
2. a. *Creo*	b. *Dudo*
3. a. *Estoy seguro de*	b. *No estoy seguro de*
4. a. *No dudo*	b. *Dudo*
5. a. *Es cosa sabida*	b. *Me parece increíble*
6. a. *Sé*	b. *No estoy seguro de*

[INSTRUCTOR'S SCRIPT: 1. *que viene a clase preparado.* 2. *que coma en McDonald's.* 3. *que viva cerca de la univeridad.* 4. *que conoce al presidente.* 5. *que tome el autobus.* 6. *que tiene mucho trabajo.*]

Activity B

Now listen to each option your instructor says aloud. Which could be the phrase that introduces each sentence fragment that follows?

1. *que será famoso algun día.*
2. *que venga mañana con su perro.*
3. *que lea más que yo.*
4. *que se levanta antes de las 6,00* A.M.
5. *que se acueste después de las 12,00* A.M.

[Instructor's script: 1. *Creo, No creo* 2. *Creo, Dudo* 3. *Sé, No estoy seguro de* 4. *Estoy seguro de, Dudo* 5. *Es verdad, No es verdad*]

Activity C

Match one of the expressions on the left to a phrase on the right to make grammatical statements about Bill Clinton. Then decide if the statement expresses your belief or not.

Columna A	Columna B
Dudo	*que siempre diga la verdad.*
No creo	*que es inteligente.*
Creo	*que Hillary esté contenta con él.*
Sé	*que sea buen amigo de Newt.*
No estoy seguro de	*que se divorciará de Hillary.*

Activity D

The class should select a fellow student as the focus of this activity. Review the statements that follow and see if, as a class, you agree with them.

1. *Creemos que es de ascendencia polaca.*
2. *Dudamos que tenga relaciones cercanas con la familia.*
3. *No creemos que vaya a casarse dentro de cinco años.*
4. *Estamos seguros de que le gusta esta clase.*
5. *Es dudoso que quiera hablar español como nativo.*
6. *No creemos que entienda el subjuntivo.*
7. *Sabemos que estudia mucho para esta clase.*

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