

Research and Perspectives on Processing Instruction



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by

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To Bernadette

“She began her study of Italian wanting rules to memorize but then came to appreciate the power of Processing Instruction.”

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An anonymous reviewer once commented on our work that we cited VanPatten's work to excess. The reviewer queried whether VanPatten was such a guru or if there were other theoreticians to cite. Without VanPatten there would be no Processing Instruction and indeed, he is the guru of this instructional intervention. We wish to acknowledge the impact that he and his work have had on our own. We are indebted to him for his work, his encouragement, and his friendship.

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Introduction

This book will track the impact processing instruction has made since its conception. It will provide an overview of new research trends on measuring the relative effects of processing instruction. Firstly, we explain Processing Instruction, both its main theoretical underpinnings as well as the guidelines for developing structured input practices so that readers can critically evaluate this approach to grammar instruction.

Secondly and more importantly we review the empirical research conducted, to date, on processing instruction so that readers will have an overview of new research carried out on the effects of processing instruction. Finally, we will reflect on the generalizability and limits of the research on processing instruction and we will offer future directions of processing instruction research.

In chapter 1 we provide a synopsis of VanPatten's theory of input processing, the one that most directly and greatly informs the practices of Processing Instruction (VanPatten 1996, 2003, 2004). We will then begin our explanation of the practice of Processing Instruction by defining and illustrating "structured input", the concept most crucial to understanding PI.

In chapter 2 we present and examine Processing Instruction. This approach to grammar instruction comprises of two elements, explicit information about the grammatical item including information about processing strategies and structured input activities. We refer to these elements as full processing instruction. The question is whether one or the other of these elements is the causal variable in processing instruction or whether both elements are necessary to achieve the effects of processing instruction. We will review research that has investigated what is the main variable responsible for the positive effects of processing instruction. We highlight the remarkable consistency of the findings. They are: (1) learners who receive no explicit information but only perform structured input activities perform equally to learners who receive full processing instruction; (2) receive full processing instruction outperform learners who receive only explicit information. We conclude that the element of full processing instruction that causes changes in language development is structured input.

In chapter 3 we present studies which have compared processing instruction to other types of instruction. The effects of processing instruction have been compared to those of two other types of instruction, both of which

emphasize language production, not language processing. They are traditional instruction with form-focused output practice and meaning-based output instruction with communicatively-focused output practices. In the review we will provide detailed analyses of the languages examined, the linguistic items tested, and the assessment tasks used. For this synopsis, we highlight the remarkable consistency of the findings. They are: 1. In all studies, learners who receive processing instruction outperform learners who receive traditional instruction on an interpretation task; 2. learners who receive processing instruction perform the same as learners who receive traditional instruction on a production task; and, a finding limited to just two studies, 3. learners who receive processing instruction perform the same as learners who receive meaning output-based instruction on both the interpretation and production tasks. As will be seen, we find that learners who receive processing instruction outperform learners who receive meaning output-based instruction on the interpretation task and are equally successful as meaning output-based instruction learners on the production test. All in all, we will present processing instruction as an “educational bargain” in which learners receive two abilities (interpretation and production) as a result of practicing how to process input appropriately.

In chapter 4 we review classroom research that has been carried out to measure the positive effects of processing instruction in a different mode of delivery. Processing instruction seems to be equally effective in promoting second language development no matter the mode of delivering the instruction. Research has shown that classroom and computer delivery of processing instruction yielded identical results across three languages (Spanish, Italian, French) and three linguistic items/structures (preterit–imperfect distinction, negative informal commands, subjunctive of doubt).

In chapter 5 we review research that has examined a variety of grammatical items that present processing problems to second language learners. Both structured input activities and enhanced structured input activities have been designed to address these processing problems. Empirical research has been conducted to examine different languages (Italian, Spanish and Japanese) and linguistic features (adjective agreement, future tense, past tense, and subjunctive). Learners improved equally by being exposed to structured input activities and enhanced structured input activities.

In chapter 6 we review an unique line of research within the processing instruction model that has attempted to assess the secondary and cumulative effects of this approach on grammar instruction. Research on processing instruction has mainly focused on measuring its direct and primary effects by

comparing this type of instruction with traditional and meaning-output based instruction. The results of the empirical research have shown that processing instruction is a better approach to output-based approaches to grammar instruction. Processing instruction is very effective approach towards altering inappropriate processing strategies and instil appropriate ones in L2 learners. The main aim of this chapter is to review classroom research that has investigated whether learners receiving processing instruction can transfer that training on the acquisition of other forms without further instruction.

In chapter 7 we review and examine research which has demonstrated that processing instruction is an effective approach to grammar teaching not only at sentence level interpretation and production measures but also at discourse level production tasks.

In chapter 8 we review and discuss research that has measured long-term effects of processing instruction.

In the final chapter we critically review classroom research and main findings of processing instruction research. We will then provide an agenda for future research in this area.

Chapter 1

The theory of input processing underlying Processing Instruction

Introduction: Working with input

Different researchers and different theoreticians focus on various aspects of second language acquisition. Some focus on input while others on output. Some model the cognitive mechanisms that occur in the brain while others model the social and interactional dimensions of second language development. In essence, researchers can easily look at SLA from different perspectives.¹ VanPatten and Williams (2007b: viii) assert that researchers understand that in order to understand the whole of SLA, they may need to concentrate on the smaller parts first. VanPatten (2004b: 27) likens SLA to building construction. “In a sense, understanding SLA is like understanding how a building works. There is the electrical system, the plumbing, the foundation, the frame, the heat and air system, and so on. All are necessary; one alone is insufficient. But like those who work in house construction and are electrical contractors or plumbing contractors, in SLA some of us are interested in matters dealing with input. Others are interested in output.” In the present work, we are concerned with input and VanPatten’s theory of input processing. We are, in particular, interested in a pedagogical intervention called Processing Instruction that teaches learners target-language appropriate ways to work with input.

1. VanPatten and Williams (2007) offering the following regarding looking at SLA from different perspectives. “To understand [why there isn’t just one theory to account for SLA], one might consider the parable about the four blind men and the elephant. These sightless men chance upon a pachyderm for the first time and one, holding its tail, says, “Ah! The elephant is very much like a rope.” The second one has wrapped his arms around a giant leg and says, “Ah! The elephant is like a tree.” The third has been feeling along side the elephant’s massive body and says, “Ah! The elephant is very much like a wall.” The fourth, having seized the trunk cries out, “Ah! The elephant is very much like a snake.” For us, SLA is a big elephant that researchers can easily look at from different perspectives ... Thus, researchers have grabbed onto different parts of the elephant as a means of coming to grips with the complex phenomenon. (VanPatten and Williams 2007: vii–viii).

What is input? The following four definitions suffice to demonstrate that input is language, presented orally or in written form. “The raw linguistic data (oral or written) to which learners are exposed.” (Farley 2005: 109). “Samples of language that learners are exposed to in a communicative context or setting.” (Wong 2005: 119). “Samples of second language that learners hear or see to which they attend for its propositional content (message).” (VanPatten 1996: 10). “Input is defined as language the learners hears (or reads) and attends to for its meaning.” (VanPatten and Williams 2007b: 9). Of additional importance is that input is language presented in a communicative context, meaning that learners are attending to the meaning of the message(s) encoded through the language directed to them.

What is input processing? Processing Instruction is rooted in what we know about what learners do with input. The process it for its meaning and that meaning is formally encoded. Input processing, then, refers to the processes by which learners make the initial connection between a grammatical form and its meaning. That is, we are concerned with how learners make sense out of the language they hear or read (input) and how they get linguistic data or intake from the input (Wong 2005: 28) “Indeed, it is common ground among all theorists of language learning, of whatever description, that it is necessary to interpret and to process incoming language data in some form, for normal language development to take place. There is thus a consensus that language input of some kind is essential for normal language learning.” (Mitchell and Myles 2004: 20). Ortega (2007: 236) reviews the role of input in the nine theories of second language acquisition included in VanPatten and Williams (2007a). The role of input in the theories varies. Input might be one ingredient only that is necessary for language acquisition but not sufficient to account for all language acquisition. Input may be a trigger. Or, input may be the driving factor in learning. VanPatten and Williams (2007b: 9) assert that any theory of second language acquisition will have to address in some way the observed phenomenon, or consensus as Mitchell and Myles call it, that exposure to input is necessary for SLA.

As stated above, we are working with VanPatten’s theory of input processing as presented in its initial form in VanPatten 1996, its modified form in VanPatten 2004b and its most recent form in VanPatten 2007. The purpose of the present chapter is twofold. First, we seek to explain what VanPatten’s theory of input processing entails. This theory provides the background for understanding Processing Instruction. Second, because the present work is a *retrospective* on Processing Instruction, we will highlight

the development and evolution of the theory from 1996 to 2007 (the most recent material available).

What is the current version of VanPatten's theory of Input Processing?

VanPatten's theory of input processing in adult second language acquisition frames the research questions, methods, and procedures used in all of the many investigations we review in this book. It is critical, then, that we begin with an explication of this theory. We draw from several sources to present our account. We draw extensively from the work of its principal theorizer, Bill VanPatten (VanPatten 1996, 2000, 2004b and 2007), as well as from our own work with and within this theoretical framework (Benati and Lee 2008; Lee and Benati 2007a, 2007b). As a theoretical framework, "Input Processing is concerned with three fundamental questions that involve the assumption that an integral part of language acquisition is making form–meaning connections:

- Under what conditions do learners make initial form–meaning connections?
- Why, at a given moment in time, do they make some and not other form–meaning connections?
- What internal strategies do learners use in comprehending sentences and how might this affect acquisition?" (VanPatten 2007: 116)

We can add to this list of three umbrella questions more specific ones, the answers to which the research on input processing has attempted to illuminate.

- What linguistic data do learners attend to during comprehension? Why?
- What linguistic data do learners not attend to? Why?
- How does a formal feature's position in the utterance influence whether it gets processed?
- What grammatical roles do learners assign to nouns based on their position in an utterance?

In its current form, VanPatten's theory consists of two overarching organizing principles of input processing, each of which is further explicated with (sub)principles. The two overarching principles address two different aspects of processing. The first, The Primacy of Meaning Principle, asserts that when learners are engaged in communicative, meaningful interchanges, they are

primarily concerned with meaning. That is, "... learners are driven to look for the message or communicative intent in the input." (VanPatten 2004b: 7) The second, The First Noun Principle, asserts that the order in which learners encounter sentence elements is a powerful factor in assigning grammatical relations amongst sentence elements. In relation to this principle, VanPatten has commented that, "... the human mind may be predisposed to placing agents and subjects in a first noun position." (VanPatten 2004: 15). These principles and their associated (sub)principles appear in Table 1.1. In this table we have traced the evolution of VanPatten's theorizing. We have presented the principles at three points in time, specifically 1996, 2004 and 2007. In their current form, the two main principles are as follows.

Principle 1. The Primacy of Meaning Principle. Learners process input for meaning before they process it for form. (VanPatten 2004: 11)

Principle 2. The First Noun Principle. Learners tend to process the first noun or pronoun they encounter in a sentence as the subject. (VanPatten 2007: 122)

The Primacy of Meaning Principle is further subdivided into six (sub)principles, labelled a through f. Some of these subprinciples had previously been referred to as the corollaries of the main principle (VanPatten 1996) whereas others are new developments to the framework. Each new development is meant to add to the explanatory adequacy and predictive capability of the theory. As we read through these subprinciples, we find that they are meant to capture the interplay of various linguistic and cognitive processes that take place during comprehension. The principles associated with the Primacy of Meaning Principle are, in their most current formulation, as follows.

P 1a. The Primacy of Content Words Principle: Learners process content words in the input before anything else. (VanPatten 2007: 117)

P 1b. The Lexical Preference Principle: If grammatical forms express a meaning that can also be encoded lexically (i.e., that grammatical marker is redundant), then learners will not initially process those grammatical forms until they have lexical forms to which they can match them. (VanPatten 2007: 118)

P 1c. The Preference for Nonredundancy Principle: learners are more likely to process nonredundant meaningful grammatical markers before they process redundant meaningful markers. (VanPatten 2007: 119)

- P 1d. The Meaning-Before-Nonmeaning Principle: learners are more likely to process meaningful grammatical markers before nonmeaningful grammatical markers.
- P 1e. The Availability of Resources Principle: for learners to process either redundant meaningful grammatical forms or nonmeaningful forms, the processing of overall sentential meaning must not drain available processing resources. (VanPatten 2004b: 14)
- P 1f. The Sentence Location Principle: learners tend to process items in sentence initial position before those in final position and those in medial position. (VanPatten 2007: 125)

When we listen to an utterance or read a sentence we are presented the linguistic elements of the sentence in a rigidly linear fashion. One sentence element precedes the next such that we must, there are no options, comprehend and interpret the sentence “as it comes” to us. While regression is possible in some reading contexts, it is rarely possible in listening contexts. Research in both first and second language acquisition has found that the order of the words plays a role in comprehension and hence in language acquisition (e.g., Slobin 1973 for first language acquisition and Lee 2003 for the second language acquisition of Spanish). VanPatten’s First Noun Principle captures one powerful and pervasive processing strategy, that is, assigning the grammatical role of subject or agent to the first noun encountered in an utterance. VanPatten has recently acknowledged that learners might transfer L1 parsing procedures to the L2 processing context (VanPatten 2004c: 330; 2007: 122). In doing so, he has proposed the possibility that his theory might yet incorporate “The L1 Transfer Principle. Learners begin acquisition with L1 parsing procedures.” (VanPatten 2004: 330). This principle has not been fully incorporated into the theory; L1 transfer remains a possibility, and yet, emerging data suggest that L1 transfer may not take place (VanPatten and Keating 2007).

Between 1996 and 2004, researchers gathered more data on the conditions that favour or attenuate learners’ misassignment of the first noun as subject so that VanPatten developed a set of (sub)principles that delineate various factors that attenuate learners’ misassignment of the first noun. The subprinciples are as follows.

- P 2a. The Lexical Semantics Principle: learners may rely on lexical semantics, where possible, instead of the First Noun Principle to interpret sentences. (VanPatten 2007: 124)

- P 2b. The Event Probabilities Principle: learners may rely on event probabilities, where possible, instead of the First Noun Principle to interpret sentences. (VanPatten 2007: 123)
- P 2c. The Contextual Constraint Principle: learners may rely less on the First Noun Principle (or L1 transfer) if preceding context constrains the possible interpretation of a clause or sentence. (VanPatten 2007: 124)

These principles model “what guides learners’ processing of linguistic data in the input as they are engaged in comprehension” (VanPatten 2007: 116). In the following section, we will explicate each of these principles in turn and, in doing so, demonstrate some of the evidence that supports them. It is important to keep in mind that learners are doing two things with the language to which they are exposed and with which they are engaged. They are, firstly, making meaning and they are, secondly, making form–meaning connections (Lee and VanPatten 1995, 2003). Making meaning is comprehending, arriving at an idea of what the propositional content of the message is. Making form–meaning connections is input processing, attending to the grammatical forms/features in the input so as to connect the forms with their meanings or functions. While related, these are not the same processes. As we further explore VanPatten’s theory of input processing we will see both types of processes at work.

How have VanPatten’s processing principles evolved?

In Table 1.2 we have placed VanPatten’s original formulation of the theory along with the research on which it was based; VanPatten (1996) is the source for Table 1.2. In this table we see that the theory first contained three principles with associated subprinciples. It’s current formulation is quite different. We also see in this table that VanPatten relied on a wide range of research and theorizing in order to develop his principles. The basis of the theory includes studies of both first and second language acquisition as well as work on both processing and production.

The 1996 work remains the most detailed account of the previous research and theorizing that led to the formulation of VanPatten’s processing principles. VanPatten’s subsequent work focused on explaining the workings of his principles, clarifying them, accounting for criticisms, and revising the principles as needed (VanPatten 2004b, 2004c, 2007). Lee and Benati (2007a, 2007b) have brought to the discussion of input processing research other than that cited by VanPatten (1996) that support his formulation of the principles.

How do the principles work?

The push to make meaning

To assert the primacy of meaning in input processing is to take as the point of departure that learners are primarily motivated to understand messages, be they delivered orally during an interaction or visually while reading print. If someone is talking to us, we assume they have something to say that we are meant to understand. Our task as listeners is to put forward at least an effort, if not our best effort, to understand the speaker. When we see an advertisement, for example, and read what it says, we assume that someone has something to communicate to us about a product, event, or service. There is a message that we are meant to grasp and we put forth the effort to do so. Second language learners assume the same thing; there are messages in what they hear and read and they are meant to put forward an effort to understand them. “Simply put, P1 states that learners are *driven* [emphasis added] to look for the message in the input (“What is this person saying to me?”) before looking for how that message is encoded” (VanPatten 1996: 17).

Meaning first. VanPatten (1996: 17) supported Principle 1 The Primacy of Meaning Principle with work in first and second language acquisition. For first language acquisition, he cited Peters’ (1985) operating principle that guides children during input processing. The principle states that children pay attention to utterances that have a readily identifiable meaning. For second language acquisition, he cited the work of Sharwood Smith (1986), who posited the difference between processing for communication, i.e., meaning, and processing for acquisition, i.e., form.

Research has repeatedly uncovered the varying conditions under which learners successfully make meaning from the input. Lee (1987), for example, showed that L2 learners of Spanish can extract the lexical meaning of verbs that are morphologically marked as subjunctive even though they had never been exposed to subjunctive forms in the classroom setting. They extracted meaning as successfully as a group of learners who had already been taught subjunctive forms. Lee and Rodríguez (1997) compared the effects of morphosyntactic modifications on passage comprehension. Keeping content constant, they manipulated subordination and whether that subordination required subjunctive mood or not. They found that L2 learners of Spanish comprehended the three versions of the passage equally well. Additionally, they substituted the target verbs (those that were subordinated and made into subjunctive mood forms) with nonsense words that conformed to the