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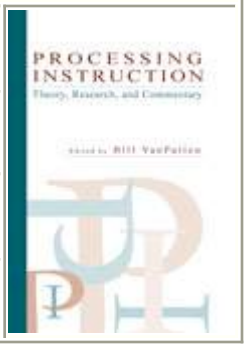
Processing Instruction: Theory, Research, and Commentary

Author:	Bill VanPatten (Ed.) (2004)	
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Processing Instruction, an edited volume by Bill VanPatten, comprises five parts that branch out into 17 chapters.

At the outset let me recommend this volume to all SLA researchers and practitioners who are looking for the next big theoretical undertaking that also has insights for the classroom.

In Part I, Foundations, VanPatten presents several publications authored by him and others that describe and discuss *input processing* and *processing instruction* (PI). Tracing the roots of the processing principles paradigm to work in child L1 acquisition, he also briefly touches on what he considers to be the greatest challenge to PI: how to apply L1 models of parsing to the L2 context. Whereas the L1 models are concerned with ambiguity resolution, he points out that it is not at all clear how the parsing mechanism can explicate acquisition processes for L2 context.

In ***Input Processing in Second Language Acquisition*** (Chapter 1), VanPatten sets out to define *input processing* as the conditions under which learners may attempt to make connections between form in the input and meaning. He also postulates that learners, because of working memory constraints and because they are paying attention to prosodic cues (that signal content or more meaningful words than functors), are only able to process input for meaning before they can process it for form. This he calls the ***Primacy of Meaning Principle***. This principle comprises five sub-principles: Learners process content before anything else (***The Primacy of Content Words Principle***), rely on lexical words to encode meaning as opposed to grammatical forms that indicate the same semantic information (***The Lexical Preference Principle***), are more likely to process non-redundant meaningful grammatical forms before processing

redundant meaningful grammatical forms (***The Preference for Nonredundancy Principle***), are more likely to process meaningful grammatical forms before non-meaningful forms, irrespective of redundancy (***The Meaning-before-Nonmeaning Principle***), must not face a drain of attentional resources while processing sentential meaning before processing either redundant meaningful or nonmeaningful forms (***The Availability of Resources Principle***), and tend to process items in sentence initial position before those in medial and final positions (***The Sentence Location Principle***). Related to the principles above are learners' tendency to process the first noun or pronoun in a sentence as the subject / agent (***The First Noun Principle***). This in turn comprises three sub-principles: learners' tendency to rely on lexical semantics rather than word order to process sentences (***The Lexical Semantics Principle***), relying on event probabilities rather than on word order (***The Event Probabilities Principle***) relying less on the first noun principle if preceding context constrains the possible interpretation of a clause or sentence (***The Contextual Constraint Principle***). However, VanPatten points out that none of these principles operates in isolation; sometimes several may act together or one may take precedence over another, and sometimes several "may collude" to delay acquisition.

Chapter 2 - The Nature of Processing Instruction by Wynne Wong, sets out the three characteristics of Processing Instruction (PI), which she defines as "a type of focus on form instruction,"thus:

1. explicit information about the target structure
2. explicit information about processing strategies
3. structured input activities

Wong then goes on to describe how to develop Structured Input (SI) activities. She points out that without first identifying a processing problem (which will enable learners to drop their less than optimal strategies for efficient ones), it will not be possible to create SI activities that will help the learner reach the goal. The other guidelines for developing SI activities follow:

a. Present one thing at a time (which will not drain learners' resources)
b. Keep meaning in focus (which means that acquisition of grammatical items will only happen if learners are required to process propositional content)
c. Move from sentences to connected discourse
d. Use both oral and written input (so that more "visual" learners would benefit from seeing written input)
e. Have learners do something with the input (a reason for attending to the input)
f. Keep the learner's processing strategies in mind (For example, "if learners are relying on lexical items to interpret tense, then we may want to structure the activities so that learners are pushed to rely on grammatical morphemes instead of lexical adverbs to get tense").

She also describes the two types of SI activities used in PI: referential--those activities that require learners to pay attention to form in order to get meaning and which have a right or wrong answer--and affective activities--those activities that require learners to

express an opinion or belief, but do not have right or wrong answers.

In Chapter 3, ***Commentary: What to teach? How to teach?*** Patsy M. Lightbown focuses on research she and her colleagues carried out with 11 and 12-year-old francophone children enrolled in intensive ESL classes. They found that neither did intensive exposure to meaning-focused English help the subjects to invert questions forms nor did it allow use of the possessive determiners *his* and *her* which French learners of English understand as the determiner agreeing not with the natural gender of the possessor but with the grammatical gender of the possessed entity (e.g., *The little girl talks to his father.*).

Again, these learners accepted subject-auxiliary verb inversion with pronouns (e.g., *Can we watch television*?) but not with full lexical nouns (**Why fish can live in water?*) which was thought to happen because of the low salience of the auxiliary in the inversion and which learners sometimes heard as 'the' in the input.

Michael Harrington's ***Commentary: Input Processing as a Theory of Processing Input*** **(Chapter 4)** levels several charges at IP. According to him, the notion of *meaning* used in the IP model was difficult to operationalize and test as is also the model's claim that learners find it difficult to pay attention to certain forms at the initial encoding of the form-meaning connection rather than the earlier perceptual stage or the later storage and retrieval stages. His next charge is that whereas the principles (principles *1* and *1a*) are couched in categorical terms, the sub-principles are couched in probabilistic terms. Another serious charge has to do with the third person *-s* in for example, *He eats the apple*. He states that the redundancy of the *-s* becomes apparent to the comprehender only when they understand that both *he* and *-s* share the feature "a person talked about but not face-to-face" (pp. 88-89). To Harrington, at the initial stages of learning when the learner does not know the form the *-s* would not be realized as redundant.

In Part II, *Processing Instruction Versus Other Types of Instruction*, the editor presents the findings of replications of the VanPatten and Cadierno study. The first three use a different linguistic item in each case whereas the fourth study by Farley examines whether the findings hold if traditional instruction (TI) is changed to "meaningful output based instruction (MOI)".

Chapter 5: Processing instruction and the French causative: Another replication - Bill VanPatten & Wynne Wong

Reporting on a replication of Allen by VanPatten and Wong, this chapter presents and discusses the contrary results that she obtained to VanPatten and Cadierno (1993): her TI and PI subjects both improved on the interpretation and production tasks, although on the production tasks TI subjects improved more than the PI subjects did.

From the research materials that Allen had used, VanPatten and Wong discovered that she not having controlled for event probabilities (e.g., on encountering *Le professeur fait étudier le verbe 'être' à l'élève--the instructor gets the students to study the verb 'to be'*)--inadvertently allowed the subjects to discount the notion 'teachers study the verb' and zero in on 'the students study the verb' from their knowledge of the situation. In

other words, the treatment did not seem to have pushed them away from typically considering a first-noun strategy. Further, as Allen had also allowed the TI subjects to review and process both third person singular sentences as well as sentences with causative verbs as in *Mes professeurs me font travailler beaucoup* (= My profs make me work hard), VanPatten & Wong state that the results Allen obtained were due to the differences in the TI treatment between the two studies. Their results demonstrated that the PI group outperformed the TI group which in turn was superior to the control group.

Chapter 6: Processing instruction and Spanish Ser and Estar: Forms with Semantic-aspectual values - An Chung Cheng

Cheng demonstrates that the Spanish *ser* and *estar* are difficult to acquire by adult speakers of English because, first of all, the learner has to acquire the distinction between adjective types (e.g., inherent vs. accidental) and between aspectual types (i.e., perfective vs. imperfective) in order to learn to use the different copula types.

She next reports on the method that was used for the study: a TI group, a PI group, and a control group which did not receive any explicit instruction on *ser* and *estar*. Cheng reports that the ANOVA (and a post hoc Scheffe' test) of the raw scores resulted in marginally significant differences between the PI and control groups and between the TI and control groups. There were however no significant differences between the PI and TI groups.

Chapter 7: The relative effects of processing instruction and meaning-based output instruction - Andrew F. Farley

Farley cites a criticism of the PI vs. TI research in that PI is completely meaning-based while TI is not, and that it was not possible to rule out the possibility that the differences between treatments that VanPatten and Cadierno obtained in their study were due to the different amounts of attention to meaning and form in the groups. Farley therefore proposes a solution to this problem; he presents his study, in which he compares PI with an output treatment that has as its object of study the Spanish subjunctive (expressing doubt)--usually expressed as a verb ending that occurs in sentence-medial position (that in turn presents a processing problem in accordance with VanPatten's principles).

The SI activity required the subject to process the subordinate clause, which was separated from the main clause, and which contained the subjunctive. This was done by directing them away from using an inefficient strategy, such as relying on the first-noun strategy, and to focus on the form, with the aim of confirming whether or not doubt was expressed in the sentence.

As the results showed that both PI and MOI had very similar effects, contrary to the other PI studies, Farley explains the anomaly by pointing out that although the subjunctive is a complex structure it is actually an easy one to grasp: when someone wants to express disbelief or uncertainty use the subjunctive.

Chapter 8: Commentary: Where PI research has been and where it should be going - Joseph Collentine

Teasing out the essential differences between FonF (Focus on Form), FonFS (Focus on Forms) and FonM (Focus on Meaning) and PI approaches, Collentine points out that PI could not be strictly called a FonF treatment because it tries to alter the principles underlying processing mechanisms. On the other hand, the FonF and FonFS treatments try to change the underlying linguistic system itself.

Making use of a statistic called Cohen's *d*, Collentine finds that PI has a greater overall effect size than TI in interpretation tasks in Cadierno (1995), VanPatten and Cadierno (1993) and VanPatten and Wong (2003). Also, he finds that the effect size for PI is six standard deviations, unlike the two standard deviations quoted in the literature for FonF studies.

In Part III, *The Roles of Structured Input and Explicit Information*, VanPatten discusses the role of explicit information (EI) in many studies in instructed SLA.

Chapter 9: Processing instruction in French: The roles of explicit information and structured input - Wynne Wong

Wong reports on a study in this chapter that sets out to find out whether subjects could be pushed to differentiate between *de/une* (with the French verb *avoir*) in order to determine whether the sentence is in the affirmative or negative. It also tried to find out if the findings of the VanPatten and Oikkenon (1996) study could be generalized to other target structures. The results showed that PI = SI > C, PI > EI; EI = SI; EI = C. In none of these did EI show superior results.

Chapter 10: The effects of structured input activities and explicit information on the acquisition of the Italian future tense - Alessandro Benati

Benati reports on a replication of VanPatten and Oikkenon (1996) that he conducted using the future tense in Italian that was chosen because the processing problem was different and it had a low frequency of occurrence in the input.

The results that were obtained showed that the PI groups were not much different from the SI groups, though both were superior to the EI-only groups.

Chapter 11: Processing instruction and the Spanish subjunctive: Is explicit information needed? - Andrew P. Farley

Using the Spanish subjunctive as the object of experimentation, Farley reports on a study to find out whether SI-only treatments are superior or PI (including EI) treatments are. For the interpretation task as well as the production tasks, the PI groups outperformed the SI groups. Farley posits that the difference seems to be due to the fact that unlike past tense inflections that indicate "pastness" readily, the Spanish subjunctive does not connect to the category of 'doubt' easily.

Chapter 12: Computer delivered implicit vs. explicit feedback in processing instruction - Cristina Sanz

Sanz while discussing the effects of different types of feedback in the literature mentions that feedback offered in CALL (computer assisted language learning) has found some pedagogical support. She reports on a study to test the effectiveness of PI outside the classroom and that immediate explicit feedback will enhance those effects. The structures in question were O-cliticpro V S and O-cliticpro V type of clauses (e.g., *Las invita Manuel al cine.*). The results showed that the type of feedback (explicit vs. implicit) produced no differential effects.

Catherine Doughty in her commentary: ***When PI is focus on form it is very, very good, but when it is focused on forms. . .*** (Chapter 13) makes the point that the four studies (Wong, Benati, Farley & Sanz) address two research questions:

1. Does PI alter any other inefficient L2 processing strategies, that is, besides the first-noun strategy?
2. What are the contributions of the individual components of PI (i.e., explanation, structured input processing, and feedback), or, put another way, which are necessary?

Doughty states that Sanz's requirement that her subjects match an utterance to a visual representation (picture or video clip) when the learner pays attention to the cues in the utterance, so that it can be matched to the meaning portrayed in the picture, is a genuine activity that fosters focus on form. This has the attendant benefit of encouraging a form-meaning mapping that would make the function of the form clearer to the learner.

However she believes that Wong, Benati, and Farley do not operationalize PI in ways that earlier studies did. She points out that the SI activities are more like language manipulation and metalinguistic activities (e.g., fill in the blank, label the sentence) than pure structured input ones. She goes on to say, "SLA research to date has demonstrated rather clearly that focus on forms results, at best, in only temporary influences on interlanguage development (citing Doughty, 2003)." What may be required is an emphasis on promoting the processing of chunks of meaningful language with only perceptual (not metacognitive) attention drawn to redundant or hard-to-notice forms. She maintains that not only do Wong and Benati simplify the input in a way that may be potentially detrimental to SLA, but they have also misunderstood Loschky and Bley-Vroman's (1993) concept of task-essentialness: learners are able to do the task albeit inaccurately.

Again citing Doughty (2003), Sanz criticizes the PI studies reported in the volume as suffering a research design problem that affects all studies of effects of different types of L2 instruction. Since the aim of PI is to enable learners in processing input so that it becomes intake, she claims that only the Sanz study can be considered valid. Moreover, she also claims that the only psycholinguistically valid operationalizing of PI is likely to be those SI activities that encourage focus on form (but excluding metalinguistic activities that encourage focus on forms) which would be a minimally specified version of PI.

Chapter 14: The long-term effects of processing instruction - Bill VanPatten & Claudia Fernandez

VanPatten and Fernandez address the issue of whether the benefits observed in the effects of the research will hold over the long term or are short-lived. They believe that if the effects of intervention are short-lived then what Krashen (1982) has claimed, that acquisition results from exposure to input and nothing else, will come true. In this chapter, they report on a study to investigate the long-term effects of PI in contrast to other long-term studies such as Lightbown (1983) and White, Spada, Lightbown & Ranta (1991) which showed either a reversal of the effects of instruction (the case of the former) or the long-term effects were attributable not only to the intervention but to the sustained (and not the "one-shot" intervention that is typical of long-term studies) intervention plus continued feedback. They point out that in structured input activities the participants are never required to produce any sentences containing the target structure. Their claim is that acquisition is not production dependent (that is, at least not the acquisition of a grammar).

The authors acknowledge that their study was beset by a few problems: they did not use a control group; their assessment tasks were metalinguistic in orientation (and therefore would invite the subjects to use explicit knowledge of the language), and therefore ran the risk of not tapping into the learners' underlying system of the target language. However, what the authors implicitly admit is another problem of greater magnitude: between the immediate post-test and the delayed posttests, the researchers "sanitized" the curriculum in such a way that the subjects were denied opportunity to engage with OVS/clitic object pronouns or any kind of feedback on the target structures.

Although the researchers found a long-term effect for PI, they posit that the decline from the immediate posttest to the delayed post-test could be due to a continued lack of evidence in the input (frequency affects durability). Although however the researchers appear to be matter-of-fact about this decline in the scores between the first posttest and the delayed posttest, it is a matter of concern that they could have brought it on themselves by "sanitizing" the curriculum. It is possible to speculate that had the researchers not sanitized the curriculum then the delayed posttests would have also perhaps shown an improvement.

It appears that instead of allowing the subjects to encounter input containing hard-to-process forms as well as salient ones which is what Doughty advocates in her commentary, the authors *simplified* the input (as regards removing the target structures in the curriculum), by controlling what the curriculum allowed the participants to be exposed to during the intervening period between the immediate post-test and the delayed post-test.

The fifth part of the volume comprises three chapters whose authors read all of the preceding chapters in order to make comments on the strengths and weaknesses of research in PI.

Chapter 15: Commentary: Some general and specific comments on input processing and processing instruction - Susanne Carroll

Carroll believes that VanPatten's claim that his *principles* are *constraints* on processing needs to be explained by recourse to the parsing mechanism that the learner might make

use of.

She restates the way in which VanPatten has conceptualized the principle of "meaning before form": "having a form is the first step in mapping a meaning onto a form" (p. 300). Further, she postulates that learners, by making use of phonetic and phonological features of words and syllables that they encounter, encode them as phonetic, phonemic, or phonological representations.

Chapter 16: On the generalizability, limits, and potential future directions of Processing Instruction research - James F. Lee

The fact that PI has been used to help learners use appropriate word orders in Spanish and French points to the generalizability of PI as an intervention that effectively changes inappropriate processing strategies. Further, as PI has positive results for syntactic strategies in Spanish and French, for perceptual strategies in Spanish and Italian and for semantic strategies in Spanish and French, Lee is confident of generalizing the applicability of PI to Romance languages, although however there could be questions of generalizability beyond Romance languages.

Nonetheless, Lee raises doubts about Cheng and Farley not screening their fourth-semester subjects to find out if they had indeed received instruction on the target structures in their first semester of study. However, they had scored low on the pre-test and were therefore included in the studies.

Chapter 17: Several reflections on why there is good reason to continue researching the effects of processing instruction - Bill VanPatten

In this chapter, VanPatten explicates how ***The Early Constraint Principle*** which may be in operation in a learner might be replaced by the ***L1 Transfer Principle*** when that learner (an English-speaking learner of L2 Spanish) may show a preference for SVO word order, the chief word order in English.

However VanPatten's proviso to this situation is that even the ***Early Constraint Principle*** may be overridden by the ***Lexical Preference Principle*** which is more "primitive/universal" than the other. As an example, he cites how L2 learners of English may process the adverb 'yesterday' in sentences they hear. Let's assume that they just manage to understand what 'yesterday' means; this understanding will usually get the learner to process grammatical forms once they match with such lexically encoded pseudo-grammatical forms such as 'yesterday'.

The seventeen chapters on the whole support the view that processing instruction is superior to other types of intervention that aim at promoting processing of form. Nonetheless, in what should have been a definitive study (Chapter 14) by VanPatten and Fernandez, the researchers seemed to have missed out on an opportunity to provide authentic input (without drawing attention to the target structures in question, of course) to the subjects in the long-term study. Although they have maintained fidelity to the stipulations of quantitative research (e.g., making sure that input that is provided in the interim period is free of contamination from the object of the study), they have neither

heeded the cautionary message that Doughty advocates (Chapter 13), nor have they understood that learners who are involved *a posteriori* in quantitative studies could provide better information about how they process language (Ilangovan, 1996).

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