



Chris Payne has a recipe for teaching form connected to meaning.

The life of PI, or Processing Instruction, began in the early 1990s when Bill VanPatten first described an approach to grammar instruction whose aim was to alter the ways in which learners attend to or process input, the language to which they are exposed. Although initial studies of PI involved the learning of Spanish, research into English was to follow. This article examines PI in its application to English as the target language.

Input

With the advent of the communicative approach to language teaching came the assertion from its proponents that input was essential for language acquisition, and today there is still consensus among theorists of Second Language Acquisition (SLA) that this is the case. Yet, although essential, exposure to input alone is clearly not enough – as is borne out by the considerable number of learners who only partially acquire the grammar of a language, despite repeated exposure to input.

Learning would, indeed, be straightforward if all the language that learners were exposed to were effortlessly acquired, but the reality is that not all input is attended to – owing to our limited capacity for processing. And language that is not noticed and attended to has a slim chance of becoming *intake*, which is the input that is processed and actually ‘goes in’ to aid language acquisition.

Processing Instruction

Processing Instruction (PI) is an input-based type of explicit grammar instruction that is predicated on the theory of *input processing*. It seeks to alter the faulty processing strategies that learners use when initially attending to input, and to instil appropriate ones that push them to make the correct connection between a grammatical form and its meaning.

PI comprises three key components:

- 1 Explicit information about the target structure.
- 2 Explicit information about processing strategies and a particular processing problem.
- 3 Structured input activities.

Output

A failure to process language correctly can negatively affect subsequent production, as is evident from the following real examples of common mistakes with two frequently-taught grammatical forms: the past simple and the present simple:

- 1 *Last weekend, we stay in a hotel.* (written sentence)
- 2 *I want to play football, but she want to play basketball.* (spoken utterance)

Grammatically incorrect language like this will be familiar to all language teachers, and it is a source of endless frustration for us that, even though our

learners *understand* how the present and past simple verbs are conjugated, they are often unable to *produce* them with any reliable degree of accuracy.

Spare a thought, too, for our learners, who are no doubt fed up with being constantly reminded about the dreaded third person *s*!

In the absence of a ‘magic bullet’ for flawed grammar, perhaps strategies from PI can help learners to master structures like these, which sometimes seem so resistant to teaching.

However, before illustrating PI activities designed to help learners with the grammar in our examples, it is time to consider the theory behind the practice.

Input processing

PI is a pedagogical intervention that draws insights from the principles of input processing, and it is to the latter that we now turn.

VanPatten points out that what underlies successful acquisition is *how* learners attend to the input they see and hear. He refers to the process by which learners make the initial connection between grammatical forms and their meanings and functions as ‘input processing’.

Principles

Input processing consists of two overarching organising principles:

- 1 **The ‘Primacy of Meaning’ principle:** *‘Learners process input for meaning before they process it for form.’*
- 2 **The ‘First Noun’ principle:** *‘Learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent.’*

Each principle is further divided into several sub-principles, some of which we will explore.

Let us begin with the second principle. Here is an example of the First Noun principle: *‘The cow was kicked by the horse.’*

According to input processing theory, learners of different L1s tend to misinterpret this passive sentence as *‘The cow kicked the horse’* – because it is the subject which is placed in the first noun position in a sentence in many of the world’s languages, not all of which have passive constructions. Interestingly, very young native English-speaking children also tend to misinterpret this example in the same way. Unsurprisingly, confusion often arises because both a cow and a

horse are animate beings that are capable of kicking.

However, the First Noun principle can be attenuated by the sub-principles of lexical semantics and event probabilities. *‘The rock was kicked by the horse’* is extremely unlikely to be misinterpreted, because *lexical semantics* precludes an inanimate object like a rock from kicking in the real world. Sometimes, both the subject and the object are animate, as in our *cow/horse* example, but *event probabilities* – the likelihood of one noun being the subject or agent as opposed to the other – enable learners to interpret a sentence correctly. For example: *‘The man was bitten by the dog’* – and not normally vice versa.

Sub-principles

Let us now take a look at four sub-principles of the Primacy of Meaning (which VanPatten then proceeds to refer to as ‘Principles’):

The first is the ‘Primacy of Content Words’ principle: *‘Learners process content words in the input before anything else.’*

Content words are the building blocks of comprehension, a fact that is well documented in both first and second language acquisition studies. In the correct version of our past tense example – *‘Last weekend, we stayed in a hotel’* – both the lexical adverbial phrase (*Last weekend*) and the *-ed* verbal inflection convey the past.

According to the ‘Lexical Preference’ principle, *‘Learners will tend to rely on lexical items as opposed to grammatical form to get meaning when both encode the same semantic information’*. In other words, lexis takes precedence over grammar, so, here, the lexical phrase *last weekend* renders the past tense inflection semantically redundant, and a redundant form is less likely to be noticed and processed by learners. As noted earlier, by ‘processing’ we understand making a form–meaning connection; but if learners derive past meaning via the lexical phrase only, the task of processing remains incomplete.

Another sub-principle that might be at work here is ‘Sentence Location’: *‘Learners tend to process items in sentence initial position before those in final position and those in medial position.’*

The position of a form in a sentence can determine the extent to which it will be processed:

- The most salient and favourable position for language – from a processing perspective – is at the *start* of a sentence or utterance, followed by *final* position.
- The least favourable position, and that which can potentially cause more processing problems, is in the *middle* of a sentence or utterance, which – coincidentally or not – is where the errors with our example structures are commonly found.

Our present tense example – *‘I want to play football but she want to play basketball’* – may also be ascribed to the ‘Preference for Nonredundancy’ principle: *‘Learners are more likely to process nonredundant meaningful grammatical form before they process redundant meaningful forms.’*

Pronouns are, generally speaking, a nonredundant form in English because it is a ‘non pro-drop’ language which, barring cases of ellipsis, requires the use of pronouns with verbs. This is



in contrast to ‘pro-drop’ languages, such as Spanish and Italian, which can omit subject pronouns in many cases.

In our example above, learners obtain meaning from the subject pronoun *she*, so the *s* in *wants* does not provide them with any new information, making it merely a grammatical marker that has little communicative value. Indeed, it is often the pronoun that is processed in preference to the semantically redundant third person *s* form.

Another nonredundant form is *-ing*, which – in studies on the order of language acquisition – is said to be acquired before the third person *s* and *-ed* past tense forms. VanPatten believes that the *-ing* morpheme is more readily processed, precisely because it is seldom superfluous and it is the sole way to convey ‘in progress’, which, in turn, attracts learners’ attention and contributes to its high communicative value.

Not all linguists attach equal importance to the concept of redundancy when processing language. Contributing to VanPatten’s book *Processing Instruction*, Michael Harrington calls into question the role of redundancy, claiming that it implies that learners are able to identify forms as either redundant or nonredundant, which is not necessarily the case for beginners, who tend to have a sketchy knowledge of grammatical forms.

Structured Input

Structured Input (SI) activities are carefully structured activities in which the target language has been manipulated to make it more salient – thus compelling the learners to attend to the grammatical form only, in order to understand meaning. Rather than requiring the learners to *produce* language, SI activities are *receptive*: the learners *see* or *hear* language that expresses a particular meaning, and they are pushed to attend to the properties of this targeted form.

Once the learners have been provided with information about the target structure, and a processing problem has been identified, we can proceed to devise and use SI activities, of which there are two types: *referential* and *affective*:

- *Referential* activities entail the learners deciding whether language is right or wrong.
- *Affective* activities, as the name suggests, entail the learners giving an affective response – such as indicating agreement or disagreement, or expressing their opinion about a real-world situation.

As already mentioned, learners have a limited processing capacity, so SI activities should start with one rule of usage at a time – and with short sentences – before moving on to connected discourse: the rationale being that we don’t want to overtax our learners.

A simple guideline to remember is: *When there is less to pay attention to, it is easier to pay attention.*

Structured Input activities

Here are two sample SI activities (adapted from Alessandro Benati and James Lee) that address the processing problems for both of our example grammar structures. Note that in both activities, the ‘Not sure’ option has been included, so that the learners’ answers are not simply a fifty-fifty guess.

Activity 1: The past tense *-ed* form

Cristiano Ronaldo – Now and before

Step 1

Read the following statements made by a journalist about the life of Cristiano Ronaldo, and decide whether each statement refers to his past life, as a Real Madrid player, or his life now, as a Juventus player in Italy.

	Real Madrid (past)	Juventus (now)	Not sure
Ronaldo ...			
1 ... receives a lot of money from advertising.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 ... reserved more time for his family.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 ... donated money to charities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 ... trained five days a week.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 ... plays football with his son.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 ... phones his wife for a chat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 ... visited sick children in hospital.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 ... scores a lot of goals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 ... liked to go to night clubs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 ... helped a charity with a selfie app.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Step 2

Now say if you think Cristiano Ronaldo was more famous when he was a Real Madrid player than he is now as a Juventus player.

The processing strategy

In Activity 1 above, all the verbs used are regular, the target *-ed* form has been placed in initial position to make it more salient, and no temporal adverbs have been included.

Admittedly, in natural language, the use of temporal adverbs with a past tense form is commonplace, but they have not been included here, so that the learners rely only on *grammatical* form to determine past time reference, and not on *lexical* items. Furthermore, although common, temporal adverbs are not always present in the sentences that the learners will encounter.

Activity 2: The present simple third person singular s form

Listen to the phrases, and decide whether or not each one refers to Simon or to his classmates.

Note: The phrases in the table below are heard by the students, but don't appear on the worksheet which they are given: they simply have to tick the correct box for each number.

Phrases heard by the students	Simon	Classmates	Not sure
1 likes English food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 play football every day.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 go to bed at midnight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 wants more free time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 loves the English weather.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 drink a lot of coffee.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 arrives late for classes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 forgets to do homework.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 hate exams.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 think English people are friendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The processing strategy

In Activity 2, the learners must identify the correct subject. The subject nouns and pronouns have been omitted from the phrases that the students hear, in order to focus attention solely on the present simple forms.

The ingredients of PI

At first glance, these two activities may strike some of us as being blindingly simplistic, so we need to verify whether the use of SI activities is supported by empirical evidence.

A study carried out by VanPatten and Oikkenon in 1996, and other research to date, concludes that, although the explicit information about the target form that is given to learners may be beneficial, it is the SI activities that are the main and most effective component of PI. Cogent arguments in favour of PI are that the studies have found that, even though the learners are not expected to *produce* the target forms during SI activities, their production of language also improves significantly.

In addition to the favourable *primary* effect on the target form, PI has a positive *secondary* effect in that learners develop better intuitions about the L2 and, consequently, they also improve in other areas not directly targeted.

Research on PI has not been carried out in isolation, but in comparison with traditional instruction (TI) that focuses more on output. The findings are unequivocal: PI is a more effective kind of instruction than TI – or is at least equally effective – and its primary effects hold over time.

In 2005, a PI study of ESL learners by Alessandro Benati yielded robust results that are wholly consistent with other research which shows that PI is a highly effective form of grammar instruction that leads to richer intake and has powerful effects on acquisition.

It is deceptively simple, but it is not simplistic.

Serving the PI

Research on PI has been published since 1993, and numerous studies have been conducted in various languages: Spanish, French, Italian, English, Japanese and German. While the Romance languages have been

thoroughly researched, it must be said that PI in English has not been studied in as much depth. Further investigation of PI in English is certainly needed, therefore, along with investigation of its long-term secondary effects on acquisition.



In conclusion, PI essentially teaches learners to reassess how they connect a form to its meaning in the input. This is achieved by manipulating the input: for example, target forms are placed in the most salient position at the beginning of a sentence, and lexical items that encode the same semantic information as the grammatical form are removed.

PI is founded on one simple precept – *if learners do not correctly process a form in the input, they do not acquire it* – so learning to process input properly is fundamental for language acquisition. If input is deemed so important for second language development, it is surely incumbent upon teachers to use at least *some* level-appropriate ideas from an input-based approach to instruction. ■

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