UNIVERSITY OF GREENWICH

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

MEASURING

PRIMARY, SECONDARY & CUMULATIVE EFFECTS

OF

PROCESSING INSTRUCTION

IN

THE ACQUISITION OF FRENCH

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Doctorate of Philosophy

May 2008

ACKNOWLEDGEMENTS

There are a number of people I would like to thank for a variety of reasons.

Firstly, I would like to express my gratitude to the University of Greenwich and especially the School of Humanities and Social Sciences which funded my research.

I would like to thank my supervisor, Dr. Alessandro Benati. I could not have imagined having a better advisor and mentor for my PhD, and without his knowledge, expertise, perceptiveness and patience this study would not have been possible.

Thank you to my colleague and friend, Dr. Zoë Pettit, for reading the manuscript so thoroughly and for her constant support. I thank all the rest of my academic colleagues at the University of Greenwich, especially Simon Dye for his priceless technical assistance.

I also would like to thank all the students on the French courses at the University of Greenwich for their forbearance and assistance during the data collection and the course arrangements.

On a different note, I would like to say a big "thank you" to all friends and family, for their support and encouragement and particularly Iman Omar for always finding kind and supportive words when they were needed the most and Charles Myers for all his love and patience during the time I carried out my work and for putting "structure" into our life.

Finally, I would like to dedicate this thesis to my sisters Sophie and Virginie, and to my parents, François and Marie-Noëlle Laval, my eternal source of inspiration.

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KEY TERMS AND THEIR ACRONYMS

SLA	Second Language Acquisition
IP	Input Processing
PI	Processing Instruction
TI	Traditional Instruction
EI	Explicit Information
SI	Structure Input
SIA	Structured Input Activity
MOI	Meaning-based Output Instruction
L1	First Language
L2	Second Language
SVO	Subject Verb Object
FonF	Focus on Form
FonFS	Focus on Forms

INTRODUCTION

Background to the research

There are many theories guiding contemporary research on Second Language Acquisition and VanPatten (2004b) observes that Second Language Acquisition is itself, complex. However, contemporary research in Second Language Acquisition has recognised the role and importance of input.

Subsequently, there have been considerable changes in terms of second language instruction. Much of this has been undoubtedly the shift from output-based practice like Traditional Instruction where the emphasis is on the mastery of the grammatical rule and production practice, to an input-based practice such as Processing Instruction of which the purpose is to alter how learners process input and to encourage better form-meaning mapping which results in a grammatically richer intake. VanPatten's Input Processing model and Processing Instruction theory in adult Second Language Acquisition (VanPatten 1993, 1996, 2000, 2002, 2004a, 2004b, 2007) frames the research questions, methods, and procedures used in the work presented in this thesis and will be reviewed in Chapter One and Chapter Two of the present study.

Research on Processing Instruction has been published since 1993 and the original VanPatten and Cadierno (1993) study on Spanish object pronouns established the way in which subsequent research has been carried out. To date, Processing Instruction research has assessed the direct or primary effects of instruction investigating whether Processing Instruction would alter inappropriate processing strategies and/or instill appropriate ones. In other words, classroom studies investigating the effects of Processing Instruction have isolated and targeted a particular linguistic feature for treatment. The learner's knowledge of the target linguistic feature is assessed prior to treatment (pre-test) and then again after

treatment (post-test). Their increased knowledge of the target linguistic item, resulting from the treatment, is what has been referred to as direct or primary effects. The results of Processing Instruction have consistently and unequivocally demonstrated a direct or primary positive effect on the target item investigated and the general findings, some of which will be reviewed in Chapter Three of the present study, show that learners receiving this type of grammar instruction benefit in their ability to process input (interpretation tasks) as well as being able to access the target feature when performing production tasks. There is a significant research database (see Chapter Three for a full review) measuring primary effects for Processing Instruction. Research in this area has compared the effects of Processing Instruction with Traditional Instruction and also other meaning-based approaches to grammar instruction. This will be discussed further in Chapter Three.

Although the positive results of the direct and primary effects of Processing Instruction on Second Language Acquisition have been validated by numerous studies, to date, there has been no empirical study in which possible secondary and cumulative transfer-of-training effects of Processing Instruction have been investigated.

In this thesis we now ask whether Processing Instruction has indirect or secondary effects and investigate this new area of research in Processing Instruction by conducting two classroom experimental studies in the attempt to determine whether learners receiving processing instruction can transfer that training to the acquisition of other forms without further instruction.

Motivation for the present study

Research on Processing Instruction has compared the effects of Processing Instruction with traditional output oriented instruction and/or Meaning-based Output Instruction. The results of the empirical research have consistently shown that Processing Instruction is a better approach to grammar instruction than are output-based approaches because those receiving Processing Instruction develop knowledge of the target as measured by both interpretation and production tasks whereas those receiving output-based instruction typically only develop knowledge of the target feature as measured by production tasks not interpretation tasks. Processing Instruction is a very effective approach to grammar instruction in that it teaches L2 learners to alter inappropriate processing strategies as well as helps them instil appropriate ones.

This thesis establishes a unique line of research within the Processing Instruction model by assessing the transfer-of-training effects of Processing Instruction on the acquisition of French. As previously said, research on Processing Instruction has mainly focused on measuring direct or primary effects on learning a specific/targeted linguistic feature. However, if the Processing Instruction treatment also results in increased knowledge of another linguistic item in which L2 learners have received no instruction, in addition to the target linguistic item, then this leads to the so-called "transfer-of-training effect". The transfer-of-training effects can be defined as "secondary effects" or "cumulative effects".

If the processing problem is the same for the two linguistic features investigated, the transfer-of-training effects are referred to as "secondary effects". For example, in the case of the linguistic features investigated in the present study, both French imperfect and French subjunctive expose second language learners to a morphological processing problem defined by VanPatten (2004b) as the Lexical

Preference Principle. The processing problem is the same for the two forms, and therefore the transfer-of-training effects are "secondary effects".

If the processing problems are two different processing problems for the two linguistic features investigated, the transfer-of-training effects are referred to as "cumulative effects". Once again, if we look at the linguistic features investigated in the present study, the French imperfect and the French causative with *faire* involve two different processing problems: the Lexical Preference Principle and the First Noun Principle (VanPatten 2004b). As different processing problems are addressed, we refer to the transfer-of-training effects as cumulative. No research has yet been conducted to determine, what, if any, are the transfer-of-training effects of Processing Instruction.

The present study is motivated by VanPatten's work on Input Processing (VanPatten 1993, 1996, 2000, 2002, 2004a, 2004b, 2007) and by a set of 11 hypotheses generated by Lee (2004, in VanPatten). In this study, three of these 11 hypotheses will be pursued. They are stated as follows:

> Hypothesis 9. Learners who receive training on one type of processing strategy for one specific form will appropriately transfer the use of that strategy to other forms without further instruction in PI.
>
> Hypothesis 10. Learners who receive PI will develop better intuitions about the L2 than learners who receive other types of instruction
>
> Hypothesis 11. The cumulative effects of PI will be greater than its isolated effects. (Lee, 2004:322)

Lee (2004: 322) points out that these hypotheses indicate a robust future for Processing Instruction research. No former empirical study has investigated the possible transfer-of-training of Processing Instruction. Therefore the purpose of this thesis is to examine these possible secondary and cumulative effects of Processing Instruction by addressing a series of questions and hypotheses (See Chapter Four, section 4.2) related to Lee's hypotheses 9, 10 and 11.

Aims of the present study

The aim of the present study is examine the extent to which Processing Instruction not only provides learners with the direct or primary benefit of learning to process and produce a linguistic feature (the French past tense imperfective aspect) on which they received instruction, but also provides learners a secondary benefit in that they can transfer that training to processing and producing another linguistic feature on which they had received no instruction (the French subjunctive of doubt and the French causative with *faire*) . This study seeks to broaden the debate around the role and effects of processing instruction.

The specific aims of the present study are as follows:

1. To find empirical evidence to support the hypothesis that Processing Instruction has a positive effect on the acquisition of the French past tense imperfective aspect.
2. To investigate whether there are any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on a French linguistic feature as measured by an interpretation and a production task.
3. To investigate whether there are any cumulative transfer-of training effects of Processing Instruction and Traditional Instruction from receiving instruction on a French linguistic feature as measured by an interpretation and a production task.

Corpus of the research

The thesis is organised as follows:

In Chapter One, VanPatten's theory of Input Processing in adult Second Language Acquisition, which frames the research questions, methods, and procedures used in the work presented in this research will be reviewed. This review will draw on the work of its principal theorizer (VanPatten 1993, 1996, 2000, 2002, 2004a, 2004b and 2007).

In Chapter Two, the general theoretical background and characteristics of Processing Instruction, a psycholinguistic approach to grammar teaching, will be described with a focus on the three basic components of Processing Instruction: Explicit Information about a linguistic form or structure; Explicit Information about a processing principle and Structured Input Activities.

In Chapter Three, a review of the different lines of research investigating the effectiveness of the primary effects of Processing Instruction, since VanPatten and Cadierno's (1993) original study, will be carried out.

In Chapter Four, the purpose and motivation of the current study will be delineated, as well as the design of the classroom experimental study, investigating the possible secondary and cumulative transfer-of-training effects of Processing Instruction on the acquisition of French. The present study examines secondary effects by measuring whether L2 learners receiving Processing Instruction on the French imperfect tense, the primary linguistic target, can transfer the instructional training they receive to the acquisition of other forms of French without further instruction in Processing Instruction.

In Chapter Five, the results of the statistical analysis of the classroom experimental study will be presented and summarised.

In Chapter Six the findings will be interpreted and discussed in relation to previous research. This last chapter includes a discussion of the implications and addresses some limitations of this study.

The Appendices contain the consent form, the two packs of teaching materials, pre-tests and post-tests used for the classroom experimental study.

CHAPTER ONE: THE THEORY OF INPUT PROCESSING UNDERLYING PROCESSING INSTRUCTION

Introduction

A series of theories guide contemporary research on second language acquisition and as stated by VanPatten (2004b:5):

> Acquisition cannot be reduced to a single process. SLA is best conceived of as involving multiple processes that in turn may contain sub-processes that work at every stage of acquisition.

However, contemporary research in second language acquisition has recognised the role and importance of input. This is well argued by Gass in the opening lines of her book:

> The concept of input is perhaps the single most important concept of second language acquisition. It is trivial to point out that no individual can learn a second language without input of some sort. In fact, no model of second language acquisition does not avail itself of input in trying to explain how learners create second language grammars. (Gass 1997:1)

We can therefore say that as far as Second Language Acquisition is concerned we are working with input and examining the ways in which learners work with input. This chapter will focus on *Input Processing Theory* developed by Van Patten and defined as follows:

> [...] the initial process by which learners connect grammatical forms with their meanings as well as how they interpret the roles of nouns in relationship to verbs. (Van Patten 2004b:5)

The aim of Input Processing has also clearly been delineated by VanPatten (2007):

> Input Processing aims to be a model of what happens during comprehension that may subsequently affect or interact with other processes. VanPatten (2007:115)

VanPatten's theory of Input Processing forms the basis of this study and a review of the main principles of the Input Processing model and associated research will be

given. The importance of input has long been recognised as central to the field of Second Language Acquisition. What is meant by this term and can it be defined?

1.1 What is Input?

It is undoubtedly the most cited linguists of all time, Noam Chomsky (1965) who introduced the idea that learners are born with an innate linguistic system, called the Universal Grammar (UG) that guides them in language acquisition. In other words, within Chomsky's framework, as stated in White (2007:52) "the linguistic competence of native speakers is underdetermined by the input that children are exposed to, hence that an innate UG is implicated".

Even the behaviourist theory (pre-1970s) which explained Second Language Acquisition without reference to mental or internal processes but solely with what was called *operant conditioning* (reference to external factors in the environment and reward in the form of praise or communicative success) recognised that hearing input and repeating after each utterance created habits that resulted in second language acquisition. Although behaviourists did not attribute any recognition of the concept that humans possess an innate set of language rules, they recognised that without language stimuli (input) learners would be unable to arrive at language learning and use.

After the non-communicative nature of behaviouristic approaches, Stephen Krashen's significant body of work in the 1970s and 80s gave a clear focus to the experimental approaches of Second Language Acquisition and led to an era of communicative language learning when he referred to it as *comprehensible input* in his Input Hypothesis (1985). Krashen suggested that learners acquire an L2 by attending to input for meaning first and consequently acquire the forms and structures of a language. Krashen's model examined for the first time the interaction

between learners and input as part of the acquisition process and its implications in teaching foreign languages. Krashen (1982:21) states the following:

> (...) our assumption has been that we first learn structures, then practice using them in communication, and this is how fluency develops. The input hypothesis says the opposite. It says we acquire by "going for meaning" first, and as a result, we acquire structure!

VanPatten (1995:170) states that Krashen (1982) provides "the strongest position on the role of comprehensible input". And although there are numerous critics of Krashen's model, his work is still frequently cited in Second Language Acquisition research partly because criticism of the model "has served to underscore the need [...] to examine what learners do with and to input as part of the acquisition process".

A decade later, no doubt inspired by the "revolution" of the Input Hypothesis and enlightened by its criticism and developments in the field, in the late eighties and early nineties, research in Second Language Acquisition has been focusing on whether or not attention to form in the input was necessary (Schmidt; 1990, 1994). Research investigating attention issues have consistently operated under the assumption that input is essential to Second Language Acquisition and many contemporary theories and models like the Competition Model (Bates and MacWhinney,1982) or the Input Processing Model (VanPatten, 1996) have been constructed on the assumption that input fuels the SLA process.

From this brief overview of some perspectives on input we demonstrate that the role of input has long been recognised in Second Language Acquisition. Many contemporary Second Language Acquisition researchers consider input crucial in the acquisition of a second language.

Let us now move on to a more comprehensive definition of the term *input* and what it refers to in the context of this research. Several experts in the field of Second Language Acquisition have expressed their view on the matter. Farley (2005:109)

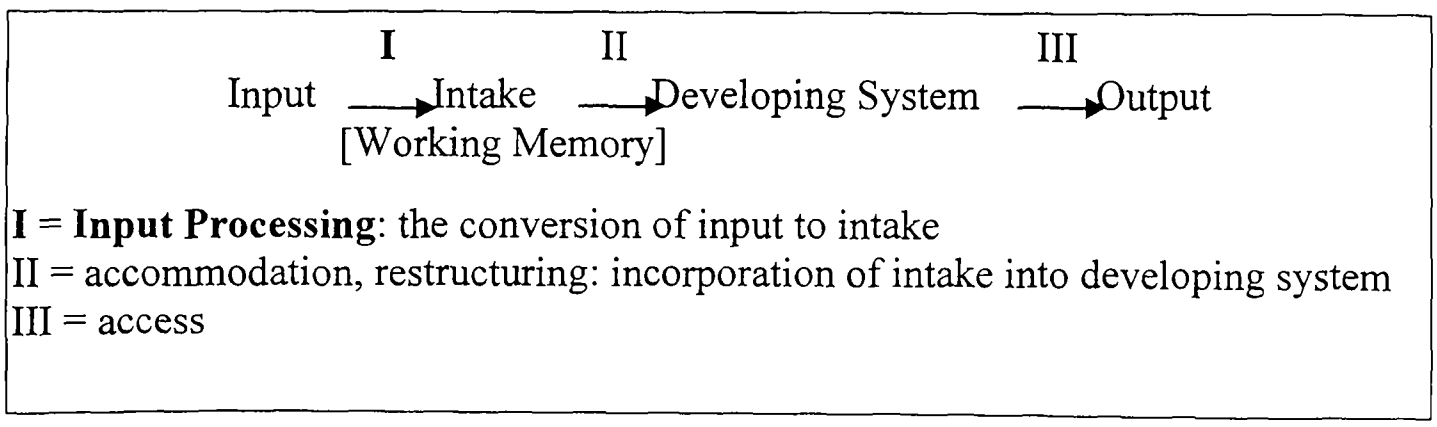
states that input is "the raw linguistic data (oral or written) to which learners are exposed". Wong (2005:119) defines input as "samples of language that learners are exposed to in a communicative context or setting". In this study the term *input* refers to VanPatten's definition: "Samples of second language that learners hear or see to which they attend for its propositional content (message)" (VanPatten 1996: 10). In other words we can say that input is the linguistic data that learners read or hear and attend to for meaning.

While clearly establishing the crucial role of input in Second Language Acquisition, it is a question of not only working with input but also investigating the ways in which learners process the input. The next section is concerned with *input processing* in Second Language Acquisition.

1.2 Input Processing: Theory and Concepts

VanPatten (1996) conceptualised Second Language Acquisition as the results of internal mechanisms consisting of at least three set of processes, each of which may contain its own sub-processes and mechanisms. These set of processes are firstly Input Processing, secondly accommodation and restructuring and finally access (See Figure 1.1). We will now turn to these three sets of processes focusing particularly on process I, Input Processing, that is how intake is derived from the input.

Figure 1.1 Three Sets of Processes in Second Language Acquisition (Wong, 2004: 34 based on VanPatten 1996:7)



Input Processing consists of the processes of making initial form-meaning connections and parsing. Initial form-meaning connections take place when a L2 learner makes, for the first time, a connection between a form and a meaning. Within the context of Input Processing parsing refers to "how learners assign syntactic categories to words they comprehend and to what kind of syntactic representation learners build during comprehension" (VanPatten, 2004b:31). In other words, Input Processing is also what determines the categories of words (noun, verb, adjective, and so on) and when a learner encounters a new word a meaning and a lexical category are attached to it. The result of input processing is that linguistic data are held in working memory.

In Figure 1.1, we can see that the process of Input Processing (I), converts input into intake. The term *intake* here refers to the portion of the input that is noticed by the L2 learner and from which form-meaning connections have been made, processed into temporary memory (working memory) and made available for further processing (VanPatten, 1996). The working memory is that "processing and storage space where online, real-time language computations are made during comprehension" VanPatten (2004b:30). It is a "space" in our head where we conduct processing of information. VanPatten (2004b:7) defines the term *intake* as "that subset of the input that has been processed in working memory and made available for further processing". Initially, only a portion of the input is processed due to processing strategies which, from a psycholinguistic perspective, are explained by the fact that learners filter input through internal processors they possess. According to the model there is a set of principles (and sub-principles) addressing different processing characteristics. For example, Principle 1 states that L2 learners will initially pay attention to items in the input that are more meaningful. They will be processed before less meaningful elements like inflections on verbs

and nouns. These content words are probably the first thing that learners process. This means that learners will also actively seek out content words. In other words if L2 learners are struggling with basic comprehension, no formal features of the language will be processed because of the limitations of the capacity of their working memory. As L2 learners process language during comprehension they briefly hold some of it in their working memory. As clearly stated by VanPatten (2002a:31) "The working memory simply does not have enough capacity to do much more than search for content words" so if the task demands exceed what L2 learners can do, processing deteriorates.

The set of principles and sub-principles provided by VanPatten's model will be described in details in the 1.3.

The second process (II) in Second Language Acquisition identified by VanPatten is a partial or complete *accommodation* of intake which is defined by Wong (2004a) as being the actual incorporation of the data in the developing system. The developing system involves two sub-processes: *accommodation* which "involves the incorporation of form into the linguistic system" (VanPatten 2002a:59) and *restructuring* which "refers to how syntax and other structures may change when the system gets certain kinds of data" (VanPatten 2002a:59). These changes can cause a ripple effect and make other things change without the learner knowing.

If we take the example of the French past tense imperfective aspect, given the complexity of verb endings in French, a learner may have noticed that a form indicates the past but has not assigned the aspectual meaning also encoded in the inflection. The connection to meaning may be partial or may be complete simply because noticing is constrained by working memory limitations regarding the amount of information learners can hold and process during real time comprehension.

Finally, Van Patten identified a third set of process (III) in Second Language Acquisition, called *access*, which is needed when learners produce language (output). As defined by VanPatten (2002a:74) output is "language the learner produces that has a communicative intent". To produce output learners must develop access and production strategies. Learners must access linguistic data that has been incorporated into their developing system and they need to put together the lexical items and forms to create sentences (production). Only part of the input is passed through intake into the developing system and eventually into output by the learner.

Despite the recognition of the importance of input in Second Language Acquisition, it is important to acknowledge that many theories and studies have concluded that output plays a significant role in Second Language Acquisition. Although it is not the focus of the present study it is appropriate here to provide a brief overview of the role of output in Second Language Acquisition.

Vygotsky (1962) hypothesised the benefits of output practice in SLA when he presented his output-related notion of *inner speech* which as described by Farley (2004) relates to a "self talk" or interior rehearsing of what later becomes audible output the aim of which is to serve as covert (unseen) practising of the L2. As summarised by Farley (2005), V ygotskian Theory considers covert output (internalised) and overt output (externally evidenced) as fundamental processes in language development.

Merrill Swain's (1985, 1995, 1998, 2005) research on the role of output practice in Second Language Acquisition in the context of immersion programs in Canada has made a significant contribution to the field. In her Output Hypothesis (1985, 1995, 2005) Swain states that the act of producing language (speaking or writing) is, under certain circumstances, part of the process of second language

learning and that without it L2 learners cannot achieve accuracy in the language. As summarised by Gass and Mackey (2007:179) Swain claims that language production forces learners to move from comprehension (semantic use of language) to syntactic use of language.

Research ascribes another function to output or production which is that it can be used to test hypotheses about the target language. Gass (1997) stated that output is fundamental to language learning operations in that it provides opportunity for hypothesis testing and feedback concerning hypotheses.

Another function attributed to output is that it promotes automaticity (DeKeysser, 1997, 2005, 2007) which, as described by Gass and Mackey (2007) refers to the routinisation of language use. This means that continued use of language moves learners to more fluent automatic production.

While a detailed discussion of the role of output in Second Language Acquisition has not been provided here, we note its importance. Furthermore, as stated previously, when referring to Input Processing, it is important to remember that it should be viewed as only one part of the complex set of processes involved in Second Language Acquisition. VanPatten (2004b:6) clearly states that "both input and output have roles in acquisition" and argues that input and output play complementary roles. However, he emphasises that the fundamental source of linguistic data for acquisition is the input that the learner receives. In other words, in the context of this thesis we take Input as the *sine qua non* for acquisition.

Referring back to the outline of the Input Processing theory, we can summarise that, according to VanPatten, Second Language Acquisition occurs as a result of internal mechanisms consisting of three sets of processes (Figure 1.1) acting on meaningful input. As illustrated in Figure 1.1, VanPatten's model of Input Processing, refers only to one process among many other complex theoretical

models in Second Language Acquisition. Input Processing consists of two sub-processes: the process of making form-meaning connections and parsing (VanPatten, 2004b:32). Input processing is what learners do to input during comprehension or how the intake is derived from the input (VanPatten, 1996).

Wong (2004b:33) proposes that VanPatten's model of input processing is "a model of how L2 learners initially process L2 input to make form-meaning connections". Farley (2005: 6) states that VanPatten's model of input processing addresses the specific issue of how intake, a subset of the input, is derived from input and which psycholinguistic strategies the L2 learner tends to rely on during input processing (See Figure 1.1). Given the large variety of terms used in Second Language Acquisition to refer to similar or related phenomena it is important, for the clarity of this thesis, to define what is meant by processing and we need to differentiate the term *processing* from the term *noticing*.

In the context of this research the term *processing* refers to VanPatten's definition (2007:114): "Process refers specifically to actually making connections between meaning and form (as opposed to mere "noticing)".In VanPatten's Input Processing model *processing* refers to "making a connection between form and meaning" VanPatten (2004b:6). In other words, processing occurs when a partial or total form-meaning connection has taken place during the act of comprehension. This means that a L2 learner has noticed a form and at the same time has assigned its meaning (or grammatical function).

On the other hand, *noticing* is the simple act of recognizing that a feature exists and as defined by VanPatten (2004b:6) refers to "any conscious registration of a form, but not necessarily with any meaning attached to it". *Processing* and *noticing* are therefore different in the sense that it is possible for a L2 learner to notice a form but not process it.

In sum, Input Processing refers to how learners make sense out of the language they hear and how they extract "linguistic data" from it (VanPatten 2002a:15). VanPatten's model of Input Processing is concerned with the first set of processes, that is the conversion of input into intake. Central to the discussion is the question of "how learners' internal processors allocate attentional resources during on-line processing" VanPatten (2006:17). VanPatten answers this question by identifying a series of processing principles that indicate how learners derive intake from input. Let us now review these processing strategies/principles used by learners to decode input.

1.3 Processing Principles

VanPatten (2007) states that:

> "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)

Research on Input Processing (cf. Chapter Three) has attempted to answer more specific questions and they can be summarised as follows:

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 or not?

What grammatical roles do learners assign to nouns based on their position in an utterance?

In its recently revised form (VanPatten, 2004b), VanPatten's theory consists of two main principles (see Table 1.1) each having a number of sub-principles (see Table

1.2 and Table 1.3). These two principles address two different processing characteristics. The first principle, The Primacy of Meaning Principle, states that when learners are engaged in communicative, meaningful interchanges, they are primarily concerned with meaning. The second, The First Noun Principle, states that the order in which learners encounter sentence elements is a powerful factor in assigning grammatical relations amongst sentence elements.

Table 1.1 L2 Processing Principles (Adapted from VanPatten, 1996, 2004b, 2007)

Principle 1 (P1).	The Primacy of Meaning Principle. Learners process input for meaning before they process it for form.
Principle 2 (P2).	The First Noun Principle. Learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent.

These principles are "what guides learners' processing of linguistic data in the input as they are engaged in comprehension" (VanPatten 2007:116).

In the following section each principle and its corresponding sub-principles, will be examined and supported by evidence.

1.3.1 Processing Principle 1 - The Primacy of Meaning Principle

The first principle, The Primacy of Meaning Principle, addresses the fact that when learners are engaged in communicative, meaningful interchanges, they are primarily concerned with meaning. Learners process input for meaning before they process it for form. Principle 1 is further subdivided into six sub-principles (a-f) (see Table 1.2). Some of these sub-principles are meant to capture the interaction of various linguistic and cognitive features during comprehension.

Table 1.2 Sub-principles to the Primacy of Meaning Principle (Adapted from VanPatten, 1996, 2004b, 2007)

Principle 1 (P1). The Primacy of Meaning Principle. Learners process input for meaning before they process it for form.
P 1a. The Primacy of Content Words Principle: learners process content words in the input before anything else.
P 1b. 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.
P 1c. The Preference for Nonredundancy Principle: learners are more likely to process nonredundant meaningful grammatical form before they process redundant meaningful forms.
P 1d. The Meaning-Before-Nonmeaning Principle: learners are more likely to process meaningful grammatical forms before nonmeaningful forms irrespective of redundancy.
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.
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.

By recognising the primacy of meaning in input processing we are taking as a starting point that learners are primarily motivated to extract messages from the input. In other words, L2 learners are primarily motivated to understand messages (oral messages during interaction or visual messages when reading). For example, in a conversation when someone is talking to us we assume we are meant to understand what they have to say and we try our best to understand the speaker. In Second Language Acquisition learners assume the same; there are messages in what they hear or read and they are meant to make an effort to understand them. In other words as stated by VanPatten (1996:17) "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's Primacy of Meaning Principle is evidenced in a number of studies which will now be reviewed. Each of the six sub-principles relate to the meaning-before-form processing tendency seen in L2 learners.

1.3.1.1 P 1a. The Primacy of Content Words Principle: *learners process content words in the input before anything else.*

This sub-principle responds to the following question: What linguistic data do learners attend to during comprehension? The answer is content words. From their L1 experience, L2 learners are aware that languages are made up of words which are not all of the same nature. L2 learners know there are, according to VanPatten (2004b) "big words" that will help them gather the essential meaning conveyed and their internal processors attempt to isolate these "big words" during comprehension while other "little words" (VanPatten, 2004b), inflections on nouns and verbs, may be, as stated in VanPatten (2004:8) "skipped over or only partially processed and dumped from working memory as the processing resources in working memory are exhausted by the efforts required to process lexical items."

According to VanPatten (2007) second language learners are first driven to make form-meaning connections that are lexical in nature. If we take the example of the French causative constructions with *faire*, VanPatten and Wong (2004) demonstrate that learners misinterpret French causative constructions using an inappropriate word order processing strategy. They give the following example (VanPatten and Wong 2004:98-99).

Jean fait promener le chien à Marie.

John-makes-to-walk-the-dog-to-Mary

John makes Mary walk the dog.

The target sentence contains two verbs each with its own subject/agent. Learners, however, tend to take the first subject, Jean, and make it the agent of the second verb, *promener*. The second subject, Marie, tends to be interpreted as the dog's owner. In the end the learners misinterpret the sentence to mean the following.

John walks the dog for Mary.

Whereas VanPatten and Wong address this processing problem from the perspective of word order and P2, the First Noun Principle, which will be further developed in section 1.3.2, we can also see the effects of processing content words over other sentence elements. The content words are underlined in the example below to demonstrate that they are the words learners focus on.

Jean fait promener le chien à Marie.

Two important grammatical elements are not processed: *fait* and *à*. They are important because they signal the underlying semantic relationships between Jean and Marie. Learners know there are differences between content lexical items (e.g., *Jean, promener, chien, Marie*) and noncontent lexical items (e.g. *fait, à,*) and will seek out content lexical items first.

Support for P1a, the Primacy of Content Words Principle, is found in a number of studies. We will now present the empirical works that have demonstrated the greater value of content words to second language learners. In Klein (1986), early stage L2 learners of German completed a repetition task in which they had to repeat sentences they heard. The results showed that L2 learners had a consistent tendency to only repeat the content words and that only advanced L2 learners were able to repeat the sentences correctly, that is, recall content words plus words serving a grammatical function.

In VanPatten (1990) L2 learners of Spanish (who were native speakers of English) heard a listening passage in Spanish on the topic of monetary inflation in

Latin America and then carried out a written recall task in English in order to see what happens when we focus learners on word final morphology. Learners were randomly assigned to four treatment groups: group one, the content only group, simply listened to the passage and had no secondary processing task to perform; group two, the content + lexical item group, listened to the passage and indicated each time they heard the word *inflación*; group three, the content + functor group, listened to the passage and took note of all instances of the word *la* (the feminine singular form of the definite article); finally, group four, the content + inflection group, listened to the passage and took note of all instances of the third person plural *-n* at the end of a verb. After listening to the passage, the learners recalled as much as they could of what they had heard.

VanPatten found that group one and group two comprehended equal amounts of the passage therefore deducing that listening for content alone and listening for content + lexical item were complementary activities. He also found that group three and group four recalled significantly fewer ideas than group one and group two which, in other words, means that listening for the functor and for the verbal inflection were equally detrimental. This study demonstrates the interplay of content words, function words, and verb morphology with comprehension and the results support the existence of P1a.

In Mangubhai (1991) L2 learners of Hindi were administered ten weeks of Total Physical Response[1] (TPR) instruction. The results indicate that all L2 learners looked to lexical items for meaning in the input they received. Learners routinely

[1] Developed by James Asher (1977), Total Physical Response (TPR) is a language teaching method, built around the coordination of speech and action; it attempts to teach language through physical (motor) activity. During TPR, the teacher is always providing comprehensible input. The method relies on the assumption that when learning a second or additional language, that language is internalized through a process of codebreaking similar to first language development and that the process allows for a long period of listening and developing comprehension prior to production.

extracted the content words from the input in order to physically respond and relied on P1a.

In Bernhardt (1992; 2007) inexperienced L2 readers of German and native readers of German had their eye movements tracked as they read a text in order to investigate text processing strategies. The tracking showed that native readers of German fixated far more frequently than inexperienced non-native readers did. Non-native readers fixate less frequently therefore they did not take in as much of the text as native readers do. She found that native readers read more densely and intensely than the non-natives did. Interestingly she also found that native readers fixated quite frequently on the ends of words, that is, on word final morphology whereas non-native readers tended to fixate on the centres of words. While they fixated less, non-native readers tended to process content words over function words. This eye movement data is very interesting in the sense that it shows how native and non-native readers take contrasting approaches to processing. The L2 learners (the non native readers), valued content words highly and valued word final morphology much less. We can conclude that the eye movement evidence supports P1a and the value of content words to learners.

Additional evidence in support of P1a can be found in Lee (1999). In his study beginner L2 learners of Spanish were asked to perform a retrospective think aloud of a passage in which eight past tense verb forms were the targeted linguistic items. The aim of this study was to analyse think aloud protocols for the interplay between input processing strategies and comprehension strategies. L2 learners were asked to read the passage sentence by sentence and then think aloud their comprehension process. The results support the primary role of content words in comprehension and show that L2 learners collect content words to build up comprehension. A distinction is made between key words and "small words".

Carroll (2004) provides further evidence to support the primary role of content words in comprehension when she discusses the role of content words in the negotiation of meaning. She refers to content words as prosodic words and specifies their place in major lexical categories. In a footnote to her commentary on VanPatten's model of Input Processing and Processing Instruction she notes that content words have the linguistic properties that allow them "to be repeated as single utterances in situations where a speaker has failed to make herself understood and believes that the learner has limited language abilities" (Carroll 2004: 298). In the example below, provided by Carroll, we can see that content words are not only important to L2 learners but also to native speakers who seem to assign them value in order to insure comprehension.

> NS: The exercises are all on my homepage.
> NNS: (…) <looks confused>
> NS: EXERCISES… HOMEPAGE
> NNS: oh…yes… EXERCISES (Carroll 2004: 298)

These findings support P1a and the fact that content words are the building blocks of comprehension.

1.3.1.2 P 1b. 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.*

VanPatten's theory attempts to account for where learners direct their processing resources. Therefore in the Input Processing model another claim is made that if a marker is redundant, it may not be processed because the learner focuses on the content words first. The term *Redundancy* in the context of this research refers to the situation when two or more elements in a sentence or discourse encode the same semantic information. This principle, called the Lexical Preference Principle, involves a competition for learners' resources when there are redundant features in the input. In this case if learners are presented with a sentence

such as "*La semaine dernière j'étais malade*" ("Last week I was sick"), in which both lexical items *la semaine dernière* and the *–ais* verb ending in *j'étais* communicate past tense, learners will not process the tense marker. Instead they will tend naturally to rely on *la semaine dernière* over the verb inflection in order to gather semantic information (when the action is taking place).

The research on the effects of Processing Instruction framed by the Lexical Preference Principle has focussed on tense assignment and has manipulated the input to include or exclude lexical and grammatical cues to tense. Preferring lexical cues to tense is connected to learners' use of content words to make meaning. A number of empirical works support the existence of the Lexical preference Principle (P1b).

Musumeci's (1989) cross-linguistic study investigated how successfully L2 learners of Italian, French and Spanish assign tense at sentence level under different exposure conditions. L2 learners were randomly assigned to four treatment groups: group one interpreted individual sentences that included a lexical temporal adverbial; group two interpreted individual sentences accompanied by the additional cue of typical hand gestures performed by the instructor as sentences were heard; group three received all cues: verbal inflections, adverbials and hand gestures and group four was given no additional cues and was forced to attend to verb endings (verbal inflections) only to determine time of action. The results showed that the two groups that interpreted sentences accompanied by a lexical temporal adverbial scored significantly higher than the other two groups that assigned tense without the aid of lexical cues. The results support P1b by showing that the main factor influencing correct tense assignment was the presence or absence of temporal adverbials in the input sentences (Musumeci 1989:127).

Bardovi-Harlig (1992) found that beginners L2 learners of English as a Foreign Language extracted past tense time-references from utterances via lexical markers whereas more advanced L2 learners of English as a Foreign Language extracted past tense time-references from utterances via verb morphology.

In a study by Lee, Cadierno, Glass and VanPatten (1997) two groups of L2 learners of Spanish received different versions of a listening passage: one group's passage contained adverbials of time while the other group's passage did not. In this second version, only the verb final morpheme indicated tense. After listening, learners were asked to perform a tense identification task. The results indicated that L2 learners who received the passage with adverbials of time identified correctly more of the temporal references than did the learners who listened to passages with only verb morphology to mark past, present (progressive) and future events in the passage. This study shows that learners relied on lexical items (adverbials of time) rather than grammatical form (verb morphology) to determine tense when both encoded the same semantic information. Therefore this directly supports P1b.

In Lee (1999) L2 learners of Spanish were asked to perform a retrospective think aloud task in order to investigate their comprehension and input processing strategies. Learners were randomly assigned to two groups: one group read a passage that contained lexical temporal adverbs and the other group read a version of the passage that did not contain the adverbs. As stated in Lee (1999: 53), "when subjects have adverbs they use them [to comprehend temporal reference]. Those in the +adverb condition only sporadically refer to verb forms". These findings once again lend support to P1b.

Finally in Rossomondo (2006) L2 learners of Spanish were asked to read and introspect two different passages in Spanish. Learners were randomly assigned to two groups: one group was asked to read and introspect on a passage that

contained Spanish future tense verb forms along with lexical temporal markers; the other group was asked to read and introspect on a version of the passage that contained only verb forms but no lexical temporal markers. The results show that L2 learners in the group which read and introspected the passage containing lexical temporal markers understood the future meaning of the target verb forms much better than L2 learners in the group which read and introspected the passage containing no lexical temporal markers.

This difference in tense assignment, due to the presence or absence of lexical temporal markers, once again supports P1b.

1.3.1.3 P 1c. The Preference for Nonredundancy Principle: *learners are more likely to process nonredundant meaningful grammatical form before they process redundant meaningful forms.*

Principles 1a and 1b have so far considered grammatical markers carrying meaning but there are some grammatical markers that do not carry meaning. And according to the Preference for Nonredundancy Principle when the input presents two or more grammatical forms, learners will naturally be more likely to process the nonredundant form. If we consider the French adjective agreement, in the example "*la voiture blanche*" ("the white car") and "*le pantalon blanc*" ("the white trousers"), there is no semantic reason why in one case *blanche* must be used and in another *blanc* must be used. In French adjectives agree with the gender of nouns. These agreement markers do not carry semantic information, only grammatical information about the gender of the noun. Additionally, the adjectival gender marking is redundant in that the noun is also marked for gender with the preceding article *la/le*. According to the Preference for Nonredundancy Principle such features of French will be processed in the input later than those for which true form-meaning connections can be made.

VanPatten (2004b) refers specifically to adjective agreement in Romance languages in the formulation of sub-principle P1c, the Preference for Nonredundancy Principle and sub-principle P1d, the Meaning-Before-Nonmeaning Principle (see table 1.2).

Lee's study (1987a) on the Spanish subjunctive supports P1c, the Preference for Nonredundancy Principle. He demonstrates how learners skip items of low communicative value during processing. A reading passage containing several subjunctive forms was presented to two groups of L2 learners of Spanish: one group had studied the subjunctive and the other had not. However, the results show that there was no significant difference between the amount and the type of information from the passage that the two groups recalled. These results show how L2 learners fail to notice and subsequently process grammatical features that are of lower communicative value during comprehension of written input. Therefore, this supports P1c.

In a separate study, Lee (1987b) examines the influence that specific morphological features (number and gender) of the Spanish direct object pronouns have on the processing of L2 sentences. L2 learners of Spanish were provided with sentences that were systematically coded for eight different varieties of *gender* and *number*. In the context of Lee's study g*ender* refers to the gender of the subject and object as being the same or different and *number* referred to the object pronoun as being singular or plural. In his study, Lee manipulates the input creating four different experimental conditions: (1) the subject and the object are both singular; (2) the subject and object are both plural; (3) the subject and object are the same gender; and (4) the subject and object are different genders. L2 Learners were presented with the sentences in writing one at a time. In each sentence the direct

object pronoun was underlined. After reading each sentence, they had to respond to the question, "What does *lo/la/los/las* refer to?"

The results show that the participants interpreted plural object pronouns ('*los/las*' 'them') as the subject significantly more often than they did singular pronouns '*lo/la*' 'him/her/it'. There was no statistically significant difference between sentences that contained objects and subjects with contrasting genders and those with the same gender. The findings show that L2 learners failed to notice and subsequently process the grammatical feature of lower communicative value, in this case the additional morphological marking of plurality (the plural –s), which prevented them from assigning the appropriate meaning to the appropriate form. Lee attributes his findings to the possibility that the additional morphological marking of plurality (the plural -*s*) exhausted the L2 learners' attentional resources, and thus prevented them from assigning the appropriate meaning to the appropriate form. In other words, this study (Lee, 1987b) details how L2 learners fail to notice and subsequently process grammatical features that are of lower communicative value during comprehension of written input and lends support to P1c.

1.3.1.4 P 1d. The Meaning-Before-Nonmeaning Principle: *learners are more likely to process meaningful grammatical forms before nonmeaningful forms irrespective of redundancy.*

According to this principle, when two forms are in competition to be processed, the meaning (or lack of meaning) of each form will determine which form will be processed. The form carrying information is more likely to be processed before the form that does not express meaning, regardless of whether or not one or both forms are redundant. Subjunctive mood verbal morphology is a grammatical form that is non-meaningful and redundant in sentences that express doubt and opinion in French (and other Romance languages). The subjunctive

mood is marked by the verb in a subordinate dependent clause when the verb of the main clause expresses doubt or opinion.

If we consider the French subjunctive mood morphology, the following two sentences will demonstrate the processing problems learners encounter.

Je doute qu'il comprenne le français.

I doubt that he understands French.

Je sais qu'il comprend le français.

I know that he understands French.

In the sentence "*Je doute qu'il comprenne le français*" ("I doubt he understands French") the verbal marker "*comprenne*" occurs in a subordinate clause and the form is triggered by the semantics of the verb phrase in the principal clause *doute*. The form is triggered by the meaning expressed in the main clause "*Je doute que*" and so the subjunctive form is nonmeaningful; *comprend* and *comprenne* both mean exactly the same thing. The morphological distinction between indicative and subjunctive is purely grammatical. The processing problem here is captured in the Meaning-Before-Nonmeaning Principle.

In his study, Bransdorfer (1989) argues that the preposition *de*, indicating possession in Spanish, has a more communicative value than the definite article *la*. During the experiment, L2 learners of Spanish (all English native speakers) heard a listening passage in Spanish and were asked to carry out a free recall task in English. Learners were randomly assigned to three groups: group one simply listened to the passage; group two listened to the passage and took written notes of all instances of the article *de* and group three listened and took written notes of all instances of the article *la*. Results show no significant difference between the performance of group one and group two and no difference between the performance of group two and three; however L2 learners in group three recalled significantly less than group one.

These findings support P1d in the sense that when learners focus on a feature of higher communicative value, this does not interfere with the overall passage recall (when compared to group one). However, when learners focus on a feature of lower communicative value, passage recall is affected significantly.

Bransdorfer (1991) replicated his study replacing *de* by *examenes* as the feature of high communicative value and replacing *la* with the verb *està* as the feature of low communicative value. The results were consistent with the previous findings and showed that the group who took notes of all instances of *està* (low communicative value feature) scored significantly less in the written recall test than the group who took notes of all instances of *examenes* (high communicative value feature). Therefore, this study also supports P1d.

1.3.1.5 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.*

According to VanPatten (2007:116):

> "Comprehension for learners is initially quite effortful in terms of cognitive processing and working memory. This has consequences for what the input processing mechanisms will pay attention to. At the same time, learners are limited capacity processors and cannot process and store the same amount of information as native speakers can during moment-by-moment processing."

As seen in their studies supporting P1a and P1d, VanPatten (1990) and Bransdorfer (1991) show with their simultaneous processing tasks, that learners can be directed to attend to nonmeaningful forms but at a loss to comprehension. In order to eliminate this loss of comprehension when focussed on nonmeaningful form, VanPatten proposes P1e, the Availability of Resources Principle, which states that comprehending overall sentential meaning can not be overly effortful if learners are also to process redundant meaningful grammatical forms or

nonmeaningful forms. VanPatten (2004b) explains that learners' proficiency level (beginner, intermediate, advanced) and their ability to access the lexical items incorporated in their developing system, are key elements which provide for the availability of processing resources.

As discussed in relation to P1a and P1b, Lee (1999) analyses the comprehension and input processing strategies of L2 learners of Spanish. Beginners L2 learners of Spanish were asked to perform a retrospective think aloud of a passage that contained eight past tense verb forms which were the target items. The results show that:

> "the comprehension strategies of low comprehenders may circumvent processing text for form. It is an interesting paradox to consider that learners' attempt to manage their comprehension has the less than desirable effect of dislocating from their attention key aspects of the input" Lee (1999:57).

In other words, comprehension difficulties can impede processing forms in the input and these findings clearly lend support to P1e.

1.3.1.6 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 (2004b:13) states that "[...]elements that appear in certain positions of an utterance are more salient to learners than others, namely, sentence initial position is more salient than sentence final position that in turn is more salient than sentence internal or medial position". Elements in the sentence initial position are encountered first and are the first on which processing resources get aligned. Therefore it is logical that they are in the most favourable processing position. With regard to the medial portion of a sentence, the processing resources are likely to still process the initial elements and then be redirected when the end of the sentence comes into focus.

The following example illustrates utterance position in French:

Charles regardait les voitures.

Charles was watching the cars.

In this utterance, the verb *regardait* is in the past tense with imperfective aspect in French and, as is the case with all tense morphemes, it can become redundant depending on a lexical item (see P1b the Lexical Preference Principle). However, it is also affected by a second processing problem, known as the Sentence Location Principle. In the example above, P1f predicts that processing the meaning and function of *Charles* as subject would be the least difficult. The verb ending tense marker *–ait* would be more difficult to process than the *–s* plural marker on *voitures*. The different levels of processing difficulty for the sentence given above as an example can be summarised as below:

Least Difficult	Utterance-initial position	*Charles*
Most difficult	Utterance-medial position	regard-***ait***
Difficult	Utterance-final position	les voiture-***s***

Therefore we can see that from an Input Processing perspective, it matters whether a form occurs in sentence initial, medial or final position with sentence initial position being the most favoured processing position of the three. As seen in the sentence above, the imperfect form frequently occurs in sentence medial position in French, the least salient processing position. It follows that learners are least likely to detect it. Research strongly suggests that there is a specific hierarchy with regard to likelihood that L2 features will be processed and affirms that initial position is the most favoured processing position.

In Klein (1986) L2 learners of German (all native speakers of Italian and Spanish) heard a series of German sentences and were asked to reproduce them. The results indicate that all learners consistently remembered the first and last

words of the sentences. In other words, this study shows that initial and final segments of the sentences were privileged for analysis more readily than items in any other position of a sentence and therefore supports P1f, The Sentence Location Principle.

Barcroft and VanPatten (1997) varied the location of target items in sentences: initial position, medial position and final position in the sentence and also used both acoustically stressed and unstressed forms. L2 Learners of Spanish were asked to repeat the sentences they heard and then it was determined how successfully the learners repeated the target items in each position. Results were similar to Klein's and demonstrated that items in initial position were repeated more successfully than items in medial and final positions. No difference was recalled between medial and final positions. Therefore, Barcroft and VanPatten's results differed from Klein's in that sentence-final elements were not privileged over elements in medial position. Results also showed that learners repeated the stressed targets more successfully than the unstressed ones.

Rosa and O'Neill (1998) replicated a portion of the Barcroft and VanPatten design and found that interactions between location and acoustic stress both affect processing.

In sum, Barcroft and VanPatten (1997) and Rosa and O'Neill (1998) show positional sensitivities in processing stressed words and show that sentence-initial position is more salient than either sentence-final position or sentence-medial position. These results confirm P1f, that initial position is the most favourable processing position and that final position is more favourable than medial position.

1.3.1.7 Summary of Principle 1

We have discussed so far one of the two major principles of VanPatten's Input Processing theory T*he Primacy of Meaning Principle* and its six sub-

principles. We have also referred to empirical evidence that supports each of them. These principles, when taken together, help us understand under what conditions learners make form-meaning connections as well as why they might make only some connections and not others. Table 1.3 lists each principle and the associated supporting research.

Table1.3 Principle 1 (a-f) and Supporting Research

PRINCIPLES	RESEARCH
Principle 1a Primacy of Content Words	Klein (1986); VanPatten (1990); Mangubhai (1991); Bernhardt (1992; 2007); Lee (1999); Carroll (2004)
Principle 1b Lexical Preference	Musumeci's (1989); Bardovi-Harlig (1992); Lee, Cadierno, Glass and VanPatten (1997);Lee (1999); Rossomondo (2006)
Principle 1c Preference for Nonredundancy	Lee (1987a); Lee (1987b)
Principle 1d Meaning-Before-Nonmeaning	Bransdorfer (1989); Bransdorfer (1991)
Principle 1e Availability of Resources	VanPatten (1990); Bransdorfer (1991); Lee (1999)
Principle 1f Sentence Location	Klein (1986); Barcroft and VanPatten (1997); Rosa and O'Neill (1998)

Let us now examine the second principle. The sub-principles will be discussed together with supporting evidence.

1.3.2 Processing Principle 2 – The First Noun Principle

This section addresses the second of VanPatten's main principles, the First Noun Principle, which asserts that learners tend to misassign the role of subject or agent

to the first noun or pronoun they encounter in a sentence. Research in both child Second Language Acquisition (Ervin-Tripp 1974; Nam 1975), and adult Second Language Acquisition (VanPatten 1985; Lee 1987; LoCoco 1987) has found that word order plays a role in comprehension and hence in language acquisition.

In child second language acquisition, Ervin-Tripp (1974) investigated L2 learners of French (all English native speakers) and their interpretation of passive constructions. Learners (all children) were asked to act out the meaning of passive sentences using toy animals. The results support the First Noun Principle in that children consistently acted out the opposite of each sentence's true meaning even though English and French have the exact same sentence structure for passive constructions. They consistently assigned the role of agent to the first noun encountered in the sentence. Nam (1975) investigated children L2 learners of English (all Korean native speakers) and the results show that L2 learners also misinterpreted passive constructions as active.

In adult Second Language Acquisition, VanPatten (1985) presented L2 learners of Spanish with Object Verb Subject (OVS) and Object Verb (OV) sentences, respectively, in which the objects were pronominalised. The findings show that learners assign the grammatical role of subject to the object pronoun. Lee (1987) also presented L2 learners of Spanish with OVS and OV sentences, respectively, in which the objects were pronominalised. The results show once again learners' use of the First Noun Strategy: again that they assign the grammatical role of subject to the object pronoun. LoCoco (1987) examines the processing strategies of L2 learners of German in their interpretation of German OVS sentences. Learners were given explicit teaching on German word order and case markers before being tested. The results once again support the First Noun Principle, showing that learners tend to skip over case markers and assign semantic

roles via word order when the object come before the verb, leading to misinterpretation. González (1997) also shows that adult Spanish L2 learners acquire word order in stages with SVO acquired first and OSV and OVS acquired last. The results of these studies on children and adult Second Language Acquisition suggest that L2 learners assign the role of subject (or agent) to the first noun or pronoun that they encounter in an utterance. L2 learners are heavily reliant on word order to assign grammatical roles. In terms of consequences for language learning, this principle may cause a delay in the acquisition of passive forms, any OVS structures and case marking, amongst others. The First Noun Principle, addresses this issue and the fact that the order in which learners encounter sentence elements is a powerful factor in assigning grammatical relations amongst sentence elements.

Languages can have different word orders such as SVO for English or less rigid word orders such as SVO, SOV, OVS for languages like Spanish and Hungarian; therefore as stated in VanPatten (2004) when processing a sentence learners must assign both grammatical (e.g., subject vs. nonsubject) and semantic (e.g., agent vs nonagent) roles to nouns in order to understand the intended meaning of the speaker.

As mentioned in 1.3.1.1 regarding the Primacy of Content Words Principle and the discussion of the French causative, learners incorrectly interpret that the agent performing the action of the second verb is the first noun. Instead of indicating that Emma walks the dog in the sentence like *Charles fait promener le chien à Emma* (literally, Charles makes to walk the dog to Emma/Charles makes Emma walk the dog) learners indicate that Charles walks the dog.

This misinterpretation can affect the acquisition of various language features and VanPatten has developed a set of three sub-principles (see Table 1.4) that describe factors that might attenuate learners' misuse of the first noun.

Table 1.4 Sub-principles to the First Noun Principle
(Adapted from VanPatten, 1996, 2004b, 2007)

Principle 2 (P2). The First Noun Principle. Learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent.
P 2a. The Lexical Semantics Principle: learners may rely on lexical semantics, where possible, instead of word order to interpret sentences.
P 2b. The Event Probabilities Principle: learners may rely on event probabilities, where possible, instead of word order to interpret sentences.
P 2c. The Contextual Constraint Principle: learners may rely less on the First Noun Principle if preceding context constrains the possible interpretation of a clause or sentence.

Each of these three sub-principles that relate to the First Noun Principle will be reviewed in the next section and empirical evidence supporting them will be provided.

1.3.2.1 P 2a. The Lexical Semantics Principle: *learners may rely on lexical semantics, where possible, instead of word order to interpret sentences.*

Research has proven that L2 learners do not only use the First Noun Strategy to assign grammatical and semantic roles. They are also sensitive to several factors, one of them being lexical semantics, which attenuate or override their use of the first noun strategy. The following sentence uses the passive form in French:

Le fromage a été mangé par la souris.

The cheese was eaten by the mouse.

The L2 learner would probably not interpret *le fromage* (the cheese) as the agent, since lexical semantics come into play. In the earlier example of the causative with

faire:"Charles fait promener le chien à Emma" two entities were equally capable (*Charles* and *Emma*) of performing the act of walking the dog. However in the passive example, the lexical semantics of the verb require that an animate being is the subject/agent of the verb, thus ruling out a misinterpretation of who did what.

Bavin & Shopen (1989) investigated the interpretation processes of children L1 learners of Walpiri, an Aboriginal language of Australia that allows sentences with any possible word order. The results show that the children relied on the First Noun Strategy when the action could have been performed either by an animate or inanimate object but when the action could have only been performed by an animate object, they relied on both the lexical semantics and event probability (see 1.3.2.2) to interpret sentences.

Gass (1989) investigates this sub-principle by giving L2 learners of English and L2 learners of Italian sentences in which verbs that could only take an animate subject were preceded by inanimate nouns, like in the following example *The tree climbed the bear*. The results showed that both groups of learners had a strong tendency to rely on lexical semantics rather than word order when interpreting this type of sentence.

The results confirm that L2 learners are sensitive to other factors and demonstrate that learners use lexical semantics to attenuate their use of the First Noun Principle. Another principle attenuating the use of the First Noun Principle, is the Event Probabilities Principle.

1.3.2.2 P 2b. The Event Probabilities Principle: *learners may rely on event probabilities, where possible, instead of word order to interpret sentences.*

L2 learners also use what they know about the world to interpret sentences. During the discussion of the First Noun Strategy, the following sentence was referred to: *Charles fait promener le chien à Emma* (Charles makes Emma walk the

dog). L2 learners tend to interpret this sentence as *Charles walks the* dog. However, if this sentence is changed to *Le chien a été promené par Emma (*The dog was walked by Emma) the learner would probably not interpret *le chien* (dog) as the agent. Given the two nouns such as *Emma* and *Chien* (dog) and the verb *promener* (to walk), it is more likely in the real world that a human being (Emma) would walk the dog than the other way round. In our earlier example of the causative with *faire* two entities (*Charles* and *Emma*) were equally capable of performing the act of walking the dog. However in the example of the passive *Le chien a été promené par Emma*, both nouns are capable of performing the action but one interpretation is more likely than another. The event probabilities are low for the first noun being the agent and are higher for the second noun being the agent. Research in Input Processing demonstrates that learners use event probabilities to attenuate their use of the First Noun Strategy and as stated previously some studies (Bavin & Shopen, 1989) demonstrate that L2 learners rely on both lexical semantics and event probability to interpret sentences.

Issidorides & Hulstijn (1992) conducted another study supporting sub-principle P2b by investigating L2 learners of Dutch and their interpretation of VSO word order. The results demonstrated that L2 learners had a tendency to rely on the First Noun Principle for interpreting sentences of VSO word order except when the first noun in the sentence was inanimate and the second was animate. The findings show once again that L2 learners rely on both lexical semantics and event probability rather than word order to interpret sentences.

The third sub-principle, the Contextual Constraint Principle, highlights the role that context can play in sentence-level processing.

1.3.2.3 P 2c. The Contextual Constraint Principle: *learners may rely less on the First Noun Principle if preceding context constrains the possible interpretation of a clause or sentence.*

Research on L2 Input Processing shows that contextual information (or a lack of contextual information) can have a significant effect on how learners process clauses or sentences containing OVS word order. VanPatten (2004, 2007) maintain that "sentence-internal linguistic context" is an additional possible constraint on learners' use of the First Noun Strategy.

VanPatten and Houston (1998) demonstrate the effects of context on sentence interpretation by giving L2 learners of Spanish a set of identical sentences. However, in one set, contextual information was included that would push learners away from interpreting the targeted clause the wrong way. The results showed less or no reliance on the First Noun Principle when the sentence learners interpreted carried contextual information. These results confirm that sentence contextual information attenuates learners' use of the First Noun Strategy and that context does provide learners with an additional clue for processing the formal elements of the sentence.

1.3.2.4 Summary of Principle 2

This concludes the discussion of the second of the two major principles of VanPatten's Input Processing theory and its three sub-principles. Supporting empirical evidence has also been presented. This set of principles, when taken together, help us understand some of the internal strategies learners use in comprehending sentences, specifically, in comprehending semantic relationships underlying surface-level word order. Table 1.5 summarises the research which supports each principle.

Table 1.5 Principle 2 (a-c) and Supporting Research in children and adult Second Language Acquisition

PRINCIPLES	RESEARCH
Principle 2 First Noun Principle	Ervin-Tripp 1974; Nam 1975; VanPatten 1985; Lee 1987; LoCoco 1987; Gonzalez (1997)
Principle 2a Lexical Semantics	Bavin & Shopen (1989); Gass (1989);
Principle 2b Event Probabilities	Gass (1989); Bavin & Shopen (1989); Issidorides & Hulstijn (1992);
Principle 2c Contextual Constraint	VanPatten and Houston (1998)

1.4 Conclusion

Input Processing is only one part, but an important part, of Second Language Acquisition. Moreover, input is essential to Second Language Acquisition. This chapter has presented VanPatten's theory of Input Processing which consists of two sub-processes: the formation of initial form-meaning connections and parsing. The theory offers a set of principles (Principle 1 and Principle 2) and sub-principles designed and formulated to explain how learners work with input, that is, how they make a connection between form in the input and its meaning. These principles help us understand not only under what conditions learners make form-meaning connections and why they might make only some connections and not others, but also the semantic relationships underlying surface-level word order. In other words, this set of two main principles help understand some of the internal strategies learners use in comprehending sentences.

Each principle and sub-principle create the foundations on which Processing Instruction has been built (Lee and VanPatten 1995, 2003; VanPatten 1993, 1996, 2004b). When we know what learners do with input, how they work with it, we can then derive instructional techniques and write instructional materials that intervene at the time learners are working with input to make form-meaning connections and not at the time when they are producing output. As can be seen from the review of processing principles, the strategies that learners use to process input are not always efficient and may sometimes be incorrect. As a result, VanPatten has developed a model of grammar teaching, Processing Instruction, as a form of instruction to resolve these processing "problems".

The next chapter presents Processing Instruction, as developed by VanPatten's (1996, 2000, 2002a, 2004a, 2007) and evaluates the role of this approach to grammar instruction in adult Second Language Acquisition.

CHAPTER TWO: PROCESSING INSTRUCTION: A PSYCHOLINGUICTIC APPROACH TO GRAMMAR INSTRUCTION

Introduction

The Input Processing model (cf. Chapter One) is concerned with the conversion of input into intake. As seen in the review of the research supporting the processing principles, the strategies used by L2 learners to process input are not always efficient and may sometimes be incorrect. As a result of these internal processing strategies, L2 learners might not be able to make correct form-meaning connections which has implications for the conversion of input into intake and inevitably on acquisition. Therefore VanPatten has developed a model of grammar teaching, called Processing Instruction that is predicated on the model of Input Processing, as a form of instruction to resolve these processing "problems". Processing Instruction aims at improving the quality of the input received by learners so that they process a greater amount of input. This richer input is called "structured input". To help learners process better input, they are given strategies to make form-meaning connections in the input they are exposed to.

Processing Instruction is one of the instructional treatments used in the classroom experimental study of this research. As such, it is necessary to establish the salient characteristics of Processing Instruction and its main purpose. This will lead to a description of its basic components: Explicit Information and Structured Input Activities.

2.1 Characteristics and Purpose of Processing Instruction:

Following the recognition of the importance of the role of input in SLA the nineties witnessed the proliferation of new proposals for potential types of focus on form interventions. VanPatten's Processing Instruction in adult Second Language

Acquisition is a comprehensive type of grammar instruction based on the model of Input Processing (cf. Chapter One). Given the plethora of terms used in Second Language Acquisition it is important here to begin with an account of Processing Instruction.

As an approach to grammar instruction based on the model of Input Processing, Processing Instruction has many characteristics and they can be summarised as follows:

- it is based on the Input Processing model;
- it is input-based as opposed to output-based;
- it is ''focus on form'' as opposed to ''focus on forms'';
- it is communicative as opposed to traditional;
- it is a type of instruction that keeps meaning in focus;
- it is intended to make learners make better form meaning connections in the input they receive;
- it is a psycholinguistically motivated approach;
- it is intended to bring learner's attention to incorrect processing strategies;
- it is a three-component approach to grammar instruction.

Processing Instruction is a focus on form input-based type of grammar instruction based on the Input Processing Model developed by Bill VanPatten in the early nineties. In Processing Instruction the pedagogical intervention takes place at the input stage when learners are actively engaged in comprehension since it is assumed that focus-on-form interventions taking place during comprehension practice tend to be less cognitively demanding than those interventions aimed at production.

The main focus of this approach to grammar instruction is to intervene when L2 learners process the language at input level in order to help them develop their internal linguistic system. Therefore Processing Instruction is an input-based approach to grammar instruction as opposed to output-based.

However, as stated by VanPatten (1996:82), Processing Instruction is not simply a comprehension/interpretation-based approach to grammar instruction because its main purpose is to ensure that L2 learners process correctly and efficiently forms/structures (one at a time) in the input they receive. It is more than a comprehension-based approach to grammar teaching because in Processing Instruction learners are asked to focus on small parts/features of the targeted language when they process the input. Learners' psycholinguistic processing strategies (See 1.3.1 and 1.3.2) are always kept in mind as the main goal of Processing Instruction is to help learners use more efficient strategies to process the input, deriving richer intake from the input. Therefore VanPatten's Processing Instruction is a psycholinguistic motivated approach in the sense that it focuses on the internal processes of acquisition and their relationship to the products of acquisition. More specifically, as emphasised by VanPatten (1996:83-4) "Processing Instruction is a specific approach to explicit grammar instruction and thus falls more clearly within the category of instructional treatments called 'focus on form' (FonF).

"Focus on form" is a fundamental aspect of language teaching and learning and is particularly concerned with the internalisation of linguistic structures. It is also a major research area within the broader domain of Second Language Acquisition. Long (1991) and more recently Long and Robinson (1998) distinguish between ''focus on form'' (FonF) and ''focus on formS" (FonFS).

FonF refers to drawing "students' attention to linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning or communication" (Long 1991:45-6) and was more recently defined by Long & Robinson (1998:23) as below:

> "focus on form often consists of an occasional shift of attention to linguistic code features – by the teacher and/or one or more students – triggered by perceived problems with comprehension or production"

The theoretical underpinning FonF derives from an assumed degree of similarity between First and Second Language Acquisition and that the two processes are both based on an exposure to comprehensible input. However, significant differences between the two processes are also assumed such as the fact that exposure to the language is not sufficient to enable learners to acquire much of the L2 grammar and that it needs to be compensated for by focusing learners' attention on grammatical features.

FonFS, on the other hand, is based on the assumption that classroom second language learning derives from general cognitive processes, and thus requires the learning of a skill. It is characterised as a "skills-learning-approach" as in DeKeyser (1998). FonFS is equated with the traditional teaching of discrete points of grammar in separate lessons. Doughty and Williams (1998:4) have defined 'focus on formS' as any type of instruction that isolates specific linguistic forms in order to teach them one at a time: "focus on form entails a focus on formal elements of language, whereas focus on formS is limited to such focus, and focus on meaning excludes it" In other words, FonFS refers to synthetic approaches to language teaching where linguistic features are isolated from the context or communicative activity. Different elements of the L2 are analysed, such as grammar and vocabulary, and these elements are taught in isolation from context. This model has been criticised by scholars (Long and Robinson, 1998; Wong and VanPatten, 2004) based on the fact

that L2 learners, rather than learning discrete lexical or grammatical items one at the time, follow predictable sequences in certain L2 features.

With regard to FonF approaches, like Processing Instruction, learners' attention is drawn to formal elements of language at times in the lesson when the main focus is on meaning. FonF approaches fit in a language syllabus that is based on meaning. As outlined by Lee and VanPatten (1995), Processing Instruction is certainly an appropriate and effective approach to grammar instruction. It is one possible way to incorporate explicit grammar instruction in a communicative framework. It is a communicative approach to grammar teaching as one of its goals is to increase learners' opportunities to receive comprehensible and meaning bearing input. At the same time it allows L2 learners to focus on the linguistic properties of the language. Lee and VanPatten (1995:94) maintain that it "is a way to incorporate explicit grammar instruction into classes without sacrificing either communication or learner-centred activities".

Processing Instruction intends to make learners make better form meaning connections in the input they receive. In 1996, Van Patten (1996:60) argues that the main goal in this approach ''is to alter the processing strategies that learners take to the task of comprehension and to encourage them to make better form-meaning connections than they would if left to their own devices''. As Wong (2004a:33) states: ''the goal of Processing Instruction is to help L2 learners derive richer intake from input by having them engage in structured input activities that push them away from the strategies they normally use to make form-meaning connections''. To summarise Processing Instruction is a psycholinguistic approach to grammar instruction based on VanPatten's model of Input Processing, "a model of how L2 learners initially parse L2 input to make form-meaning connections" Wong (2004a:35).

Processing Instruction has further been described by Wong (2004a:35) as a pedagogical approach to grammar instruction that "pushes learners to abandon their inefficient processing strategies for more optimal ones so that better form-meaning connections are made". That is to say that in Processing Instruction learners' psycholinguistic processing strategies must be kept in mind at all times. For instruction to be considered as Processing Instruction, it must address a processing problem. The role of Processing Instruction then, is to alter the default strategies that learners adopt when processing input.

How can Processing Instruction actually alter these processing strategies? VanPatten suggests that learners should be provided with Structured Input Activities. In other words, the input is carefully manipulated so that, in order to carry out the task, L2 learners are induced to process the target grammatical features: "Learners are pushed to attend to properties of the language *during activities in which they hear or see language that expresses some meaning.*" (VanPatten, 1996: 6, italics original). VanPatten and Sanz (1995) argue that exerting this control of attention on particular features of grammar during comprehension is an effective way of maximising form-meaning connections in the process of conversion of input into intake.

The next section will examine the three basic components of Processing Instruction in detail with an emphasis on Structured Input Activities, which are key to altering L2 learners' inefficient processing strategies.

2.2 The three basic components of Processing Instruction

As Wong (2004a: 35) affirms: "PI has three basic characteristics. First, learners are given information about how the linguistic form or structure works, focusing on one form or use at a time. This explicit information also informs

learners about a particular Input Processing strategy that may lead them to process the input incorrectly. This is the second characteristic of Processing Instruction. The third characteristic of Processing Instruction involves giving learners Structured Input Activities."

Processing Instruction's main objective is to help learners circumvent ineffective processing strategies or to instill appropriate ones so that they derive better intake from the input (See Figure 1.1) and Structured Input Activities purposely take into account the processing strategies of the learner in order to push learners to notice and process target forms that might otherwise go unnoticed. Summarised by Van Patten (1996, 2004), Processing Instruction consists of the following three basic components:

a) Explicit information about a linguistic form or structure;

b) Explicit Information about a processing principle;

c) Structured Input Activities

These three basic components will be examined in detail. First of all let us consider Explicit Information in relation to a linguistic form or structure.

2.2.1 Explicit information about a linguistic form or structure

The first component of Processing Instruction is that learners are given information on the linguistic form or structure, focusing on one form at a time. Explicit Information is defined by VanPatten and Oikkenon (1996: 6) as "explanation about properties of language provided by an instructor, teaching materials or some other external sources". An example of what the Explicit Information may look like in Processing Instruction is found in Figure 2.1. The target of instruction here is the past tense with imperfective aspect in French.

Figure 2.1 Example of Explicit Information in Processing Instruction

The French "*Imparfait*"
Third person singular form

We often use sentences in the past tense to describe a past event or an on-going action in the past.
E.g. *This morning Charles was speaking to his mother on the phone.*

In this sentence we are using the imperfect. In French it is called *l'imparfait*. This past tense has different forms from the present tense.
E.g. Ce matin, Charles parlait à sa mère au téléphone.

- **USE:**

The imperfect tense (**l'imparfait**) has two primary uses:

1. To describe on-going actions and states of being in the past: The *imparfait* is used to describe people, places, conditions or situations in the past.
2. To state habitual actions or states in the past.

- **FORMATION**

Let's look only at the third person singular (il/elle/on) of the French *imparfait*.
The ***imparfait*** is formed by dropping the **-ons** ending from the <u>present</u> "**nous**" form of the verb and by adding the imparfait ending for the third person singular (il/elle/on): **-ait.**

	Présent	**Imparfait stem**	**Imparfait**(Il/Elle/On)
Parler	Nous **parl<u>ons</u>**	**Parl-**	Il **parlait**
Finir	Nous **finiss<u>ons</u>**	**Finiss-**	Il **finissait**
Boire	Nous **buv<u>ons</u>**	**Buv-**	Il **buvait**

Example: 

Marie **dînait** au restaurant avec son petit ami.
Marie was having dinner in a restaurant with her boyfriend

☺ **There are four clues that will help you recognise the third person singular imperfect verb forms:**

1. The past tense imparfait (third person) of regular verbs is formed by dropping the -ons ending from the <u>présent</u> indicative "nous" form of the verb and adding the imparfait endings: – **ait**

2. Verbs in the imparfait (third person) end in a stressed sound (***-ait***) which is very important to listen for when deciding if something occurred in the past or present. (Remember, the present tense forms are unaccented).

3. Foreign language learners are sensitive to position within a sentence. The easiest forms to process are those located in initial position within a

sentence. The second easiest forms to process occur in sentence final position. The most difficult forms to process are those that occur in the middle parts of sentences, which is where you are more likely to find verbs in French, so it is important to listen for sound and stress.

4. The past form is usually accompanied by temporal adverbs that will indicate that the action has already happened in the past. Here are some of the most common ones: hier (*yesterday*), la semaine dernière (*last week*), avant-hier (*the day before yesterday*), hier soir (*last night*), l'été dernier (*last summer*) etc.
   However, although these adverbs are a good clue that an action has occurred in the past, they are not always present in the sentences. That is why it is very important for you to recognise past tense verb forms. Fortunately, the imperfect verb form is stressed, making it a bit easier to hear.

In the activities that follow, we will practice hearing and interpreting the French past tense: "l'imparfait".

2.2.2 Explicit Information about a processing principle

Explicit Information informs learners about a particular input processing strategy that may lead them to process the input incorrectly. This is the second characteristic of Processing Instruction. If we refer to Figure 2.1 again, as mentioned above, the target of instruction is the past tense with imperfective aspect in French and, as is the case with all tense morphemes, one of the processing problems is that it can be made redundant by a lexical item (see 1.3.1.2 P1b the Lexical Preference Principle). It is also affected by a second processing problem, the Sentence Location Principle. As explained in 1.3.1.6, from an input processing perspective, it matters whether a form occurs in sentence initial, medial or final position with sentence initial position being the most favoured processing position of the three. As seen in the examples in Figure 2.1, the imperfect form occurs in sentence medial position, the least salient processing position which learners are unlikely to detect.

In order to alert learners to potential processing problems, the explanation includes information about learners' processing strategies (see section in Figure 2.1 entitled

"*There are four clues that will help you recognise the third person singular imperfect verb forms*".)

The third and final component of Processing Instruction involves giving learners Structured Input Activities. Given how crucial Structured Input Activities are to Processing Instruction, a description of Structured Input Activities will be given as well as a summary of the six guidelines proposed by VanPatten (1996) for the successful design of Structured Input Activities.

2.2.3 Structured Input Activities

The term "structured input" is used because the input has been carefully manipulated so that learners are pushed away from the processing strategies/principles described earlier. The aim of these Structured Input Activities is to help learners create intake from input (See Figure 1.1) therefore they do not produce the target structure and are pushed to make form-meaning connections by requiring them to rely on form or structure to interpret meaning. To develop effective and appropriate Structured Input Activities some procedures need to be followed (see Wong, 2004a).

The first stage is to identify and understand the processing problem for the target form or structure. Which strategies are causing learners to process the form or structure incorrectly? Is it due to a tendency to rely on Principle 1 or on Principle 2, or is it a combination of factors. Once the processing problem has been identified the Structured Input Activities can be developed following the guidelines (See Table 2.1) first outlined in VanPatten (1993), then in Lee and VanPatten (1995, 2003), VanPatten (1996), Wong (2004a) and Farley (2005). These guidelines produce Structured Input Activities that help learners to process one form and one meaning at a time, thereby circumventing processing problems.

Table 2.1 Summary of Guidelines for Developing Structured Input Activities (Adapted from Farley, 2005)

a. Present one thing at a time. **b. Keep meaning in focus.** **c. Move from sentences to connected discourse.** **d. Use Both Oral and Written Input.** **e. Have Learners Do Something With the Input.** **f. Keep the Learner's processing strategies in mind.**

a. Present one thing at a time.

According to guideline a, only one rule and/or one form should be presented at a time. With the one-at-a-time approach learners will have less to pay attention to and therefore it becomes easier to concentrate and make correct form-meaning connections. Learners will then be provided with more opportunities to engage in meaningful practice and receive less grammar explanations.

b. Keep meaning in focus.

As pointed out in VanPatten (1996):

> If meaning is absent or if learners do not have to pay attention to meaning to complete the activity, then there is no enhancement of input processing.

In guideline b, meaning must be kept in focus at all times since acquisition cannot happen without exposure to input that contains some kind of referential meaning or communicative intent. Learners must be able to complete an activity by understanding what they hear or see.

c. Move from sentences to connected discourse.

As Farley (2005:14) stated "During the initial stages of exposure to a form, learners will struggle even more if utterances are not kept short". However, exposure to connected discourse is important for L2 learners. Therefore, guideline c

states that activities should move from shorter sentences to more lengthy ones and then to connected discourse.

d. Use both oral and written input.

Guideline d states that both oral and written input should be used in Structured Input Activities to allow sound-meaning connections by hearing the sound and form-meaning connections by reading. This guideline accounts for individual differences.

e. Have learners do something with the input.

As Wong (2004a) stated "Structured Input Activities should not only be meaningful but also purposeful". Structured Input Activities should have learners responding to the input by making decisions based on meaning and form to ensure they are actively processing. Learners must be engaged and must respond to the input sentence through referential and affective types of structured activities instead of just being passive recipients of input.

f. Keep the Learner's processing strategies in mind.

This guideline is certainly the most important guideline for developing Structured Input Activities since the aim of Processing Instruction is to alter default processing strategies that learners adopt when processing input so that they adopt better ones. These processing strategies must be kept in mind at all times when developing Structured Input Activities.

In this section we have identified the six guidelines proposed by VanPatten (1996) for the successful design of Structured Input Activities. However as stated in Wong (2004a) there are two types of Structured Input Activities used in Processing Instruction: referential and affective activities which are described below.

2.2.3.1 Referential activities

Referential activities require learners to pay attention to the targeted grammatical form in order to understand meaning. They are the type of activities for which there is a right or wrong answer so the instructor can check whether or not the learner has actually made the correct form-meaning connections. This is exemplified in Activity 2 in Figure 2.2 below. The target structure in these activities is third person past tense with imperfective aspect in French.

Figure 2.2 Example of a Referential Activity

Activity 2: **Zinédine Zidane: avant et après…**

Step 1

Listen to the following statements made by a journalist about the life of Zinédine Zidane and decide whether each statement is referring to his past life as a professional football player or his life now as a retired football player.

Professional football player	Retired football player
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑

Step 2 Now decide if Zinédine Zidane was busier when he was a professional football player or now that he is retired.

Sentences heard by learners:

Zinédine Zidane…

1. … jouait au football dans le monde entier
2. … gagnait beaucoup de coupes.
3. … passe du temps avec sa famille.
4. … participait à beaucoup de diners officiels.
5. … s'entrainait avec Ronaldo.

6. … s'occupe de ses enfants.
7. … est directeur de l'association ELA.
8. … marquait beaucoup de buts.

In Activity 2 learners are required to process the verbal inflection correctly in order to correctly decide to which part of Zinédine Zidane's life the sentence refers and then they must form a conclusion about whether Zinédine Zidane was busier when he was a professional football player or now that he is retired (i.e., do something with the input). In Activity 2, lexical items and discourse that would indicate a time frame have been removed so that only the verb endings encode tense in the input sentences. This is done in order to encourage learners to attend to the grammatical markers. Additional care has been taken to ensure that the form occurs in a salient initial position the most favoured processing position of the three (cf. 1.3.1.6).

2.2.3.2 Affective activities

Affective activities do not have right or wrong answers. Instead they are those in which learners are required to express an opinion, belief or indicate some other affective response to real world information. Their purpose is to reinforce the connections by providing learners with more opportunities to see or hear the form used in a meaningful context. They also help to keep the focus on learners (a key aspect of communicative language teaching) by asking them to express an opinion or some personal view. This type of activity is exemplified in Activity 3 in Figure 2.3 below. The target structure in is the third person past tense with imperfective aspect in French.

Figure 2.3 Example of an Affective Activity

Activity 3 (adapted from Farley, 2004): In their teens…

Step 1

Imagine what your parent's life was like as a teenager many years ago. What about another relative and your instructor? Can you imagine who partied too much? Who argued with his/her teacher a lot? Read over each statement and decide whether each individual (parent, relative or instructor) would have been doing these things or not.

Il/Elle…

	Parent	Relative	Instructor
1. … se disput**ait** avec son professeur.	❑	❑	❑
2. … ne pass**ait** pas son baccalauréat.	❑	❑	❑
3. … trich**ait** aux examens.	❑	❑	❑
4. … av**ait** de très bonnes notes.	❑	❑	❑
5. … buv**ait** de l'alcool à 15 ans.	❑	❑	❑
6. … fais**ait** la fête toute la nuit.	❑	❑	❑
7. … visit**ait** beaucoup de pays.	❑	❑	❑
8. … organis**ait** des soirées étudiantes.	❑	❑	❑

Step 2 Find out if your instructor used to do any of the above. Are you surprised?

In Activity 3 there is no right or wrong answer. Learners are asked to process sentences about their parent/relative's life as a teenager to give a personal opinion. Once again the input is structured so that attention to form is privileged. The target form is once again in a salient initial position and is visually enhanced through bold type. The activity makes learners do something with the input by requiring them to form their opinions on their instructor's life as a teenager and share them with classmates.

To summarise, referential activities allow instructors to make sure that learners are focusing on the relevant grammatical information to make the correct form-meaning connections. Instruction should begin with these activities.

The next section explains how the components of Processing Instruction would alter L2 learners' inefficient processing strategies.

2.3 How do Processing Instruction components alter L2 learners' inefficient processing strategies?

As seen in the previous sections of this chapter, Processing Instruction is a type of grammar instruction based on Input Processing which provides learners with Explicit Information about the target form or structure and about a particular input processing strategy that may lead learners to process the input incorrectly. Learners are indeed informed about a particular processing strategy (See Table 1.1) that is causing them to process the form or structure incorrectly such as, for example, the First Noun Strategy. they are informed where to focus their processing efforts. Once the processing problem has been identified and highlighted to L2 learners, Structured Input Activities can begin. Structured Input Activities allow learners to process form in the input, enabling them to make better form-meaning connections. These activities are designed with the ineffective strategies in mind in order to help learners use more efficient strategies to process the input. The goal of Processing Instruction is to alter L2 learners' inefficient processing strategies and Structured Input Activities are the key element for L2 learners to achieve this. In other words, Structured Input Activities are the most critical part of Processing Instruction. In Structured Input Activities, the input is carefully manipulated in particular ways to push learners to become dependent on form or structure to get meaning. The input-focused practice of Structured Input Activities in Processing Instruction is carefully structured so that learners need to attend to the target grammatical form/structure to understand the meaning and complete the activity. The input is also manipulated so as to make it more salient: only one form is represented at a time, and the key forms

appear at the beginning of the sentences, a position that has been identified as more salient (Rosa & O'Neil, 1998). In Processing Instruction, Grammar explanation is based on both linguistic and psycholinguistic principles and is designed to make learners aware of the need to change specific processing strategies. VanPatten (2002) claims that Processing Instruction is used to ensure that learners' focal attention during processing is directed towards the relevant grammatical items and not elsewhere in the sentence.

This unique approach to grammar instruction aims to improve the quality of the input received by learners so that the amount of input becoming intake will increase. This is accomplished by pushing L2 learners to process grammatical forms in the input and make form-meaning connections. One of the main empirical findings of the studies on Processing Instruction is that the effects are not limited to learners' ability to process input better, but have a direct effect on their developing system and eventually L2 learners can access the targeted linguistic feature when producing output. According to VanPatten (2002a), learners receiving Processing Instruction experience a change in their underlying knowledge that allows them to perform different kinds of tasks.

2.4 Conclusion

As stated by VanPatten (1993, 1996, 2000, 2002a, 2004, 2007), Processing Instruction is an instructional technique that addresses both the learner's attentional resources and the characteristics of the target form, such as salience and communicative value. This chapter presented VanPatten's model of Processing Instruction, its characteristics, its main aim and how its components alter L2 learners' inefficient processing strategies.

This approach to grammar instruction is an explicit instructional strategy based on Input Processing and it attempts to change the way input is processed by L2 learners through the provision of three main components (VanPatten, 1996; VanPatten, 2002a; Wong, 2004a) summarised as follows:

(1) L2 Learners are presented with Explicit Information about a linguistic form or structure: the learners are given an explanation in which the rules of the target grammatical feature are broken down.

(2) L2 Learners are presented with Explicit Information about a processing principle. They are made aware of incorrect processing strategies which may alter the way they attend to a form or a structure in the input.

(3) L2 Learners are provided with Structured Input Activities which allow them to process form in the input so that they are able to make better form-meaning connections.

Processing Instruction helps learners to derive richer intake from the input by engaging them in Structured Input Activities that push them away from the strategies they normally use to make-form meaning connections.

Structured Input Activities are a key element, if not the key element, for Processing Instruction to achieve its goal. By carefully manipulating the input and improving the quality of the input received by L2 learners during Structured Input Activities L2 learners are driven to process grammatical forms in the input and make form-meaning connections, leading inevitably to an increase in the amount of input becoming intake.

The effectiveness of Processing Instruction has been researched and generalised to different linguistic structures in different languages. The next chapter will serve to concretely reveal what makes Processing Instruction effective (the benefits of Processing Instruction to help learners notice a form, process it and

acquire it) by reviewing various lines of research which investigate the primary effect of Processing Instruction and support the original claim by VanPatten and Cadierno (1993) that intervention in learner's processing strategies has a significant impact on the learner's developing system.

CHAPTER THREE: MEASURING THE PRIMARY EFFECTS OF PROCESSING INSTRUCTION

Introduction

As described in Chapter Two, Processing Instruction is a unique approach to grammar instruction which aims to improve the quality of the input received by learners so that the amount of input becoming intake will increase. This is accomplished by pushing learners to process grammatical forms in the input and make better form-meaning connections. In addition this can help them become better at parsing (VanPatten, 1996). The effectiveness of Processing Instruction has now been researched for more than fifteen years in numerous research studies all addressing specific problems and exploring different areas.

In a first set of studies the effects of Processing Instruction on Second Language Acquisition have been examined and compared to Traditional Instruction and then the effects of Processing Instruction were measured to a more Meaning-based Output type of Instruction.

In recent years, classroom research investigating the effects of Processing Instruction has expanded from the original question of whether this instructional approach is more efficient than others. This second line of research has extended to identifying some of the variables constituting Processing Instruction, and testing whether the beneficial effects of Processing Instruction should be attributed to the Structured Input component or the Explicit Information component.

A more recent third line of research has focused on measuring the effects of delivering Processing Instruction via different modes (e.g. computer vs. pencil and paper).

Another new line of research has attempted to compare Processing Instruction to other input enhancement techniques and the focus has been on two areas of investigation: input processing and input enhancement.

The latest and final line of research (although still quite limited) has been investigating the long-term effects of Processing Instruction.

In this chapter, in order to concretely reveal what makes Processing Instruction effective, we will review these different lines of research, which investigate the primary effect of Processing Instruction, by answering the following six questions:

1. How does Processing Instruction compare to other types of instruction?
2. Can Processing Instruction be delivered effectively online as well as in classrooms?
3. What are the causative factors in the positive effects of Processing Instruction?
4. Can the positive effects of Structured Input on language development be increased by enhancing it aurally and/or textually?
5. Are the effects of Processing Instruction durative (short-term) and longitudinal (long-term)?
6. How have the effects of Processing Instruction been measured?

3.1 How does Processing Instruction compare to other types of instruction?

Since VanPatten and Cadierno's (1993) initial research work, numerous studies have addressed specific problems and explored different areas that have further evaluated the effectiveness of Processing Instruction. Let us begin by considering the first line of research mentioned in the introduction to this chapter, which measures the effects of Processing Instruction on Second Language Acquisition in relation to Traditional Instruction and also Meaning-based Output Instruction. The aim here is to establish the performance of Processing Instruction in comparison to other types of instruction.

First it is necessary to define in greater detail what is considered to be Traditional Instruction and Meaningful Output-based Instruction in the context of this research.

Traditional Instruction is defined by VanPatten (1996:57) as an output-based instruction where learners are given explanations about the target feature which they then immediately practice in output exercises, moving from mechanical, to meaningful to communicative drills. Meaningful Output-based Instruction (MOI) is a treatment consisting of structured output activities rather than Traditional Instruction's mechanical-meaningful-communicative drills. MOI, as described by Lee and VanPatten (1995:121), consists of two main characteristics:

1) learners are asked to be involved in activities which required the exchange of previously unknown information;
2) learners are asked to access a form or a structure with the intent to express meaning.

Farley (2004: 146) proposes that the MOI treatment is different from traditional output-orientated instruction types in that there is no mechanical component. The MOI activities are all meaning-based and require learners to use both meaning and form at some level during production.

In this first line of research, it was hypothesised that Processing Instruction would be more effective than traditional grammar instruction, since it provides a more direct route for the learner to convert input to intake. Typically, in these studies, Processing Instruction groups received instruction about the target linguistic form or structure followed by explicit information on the processing strategy and subsequently completed a number of Structured Input Activities (both referential and affective as described in Chapter Two). In other words, for Processing Instruction the input was 'structured' so that the grammatical form investigated carries a meaning and the learner must attend to the form to complete the task.

On the other hand, Traditional Instruction groups received instruction about the target language (with no mention of the processing strategy) followed by

mechanical and communicative practice. Drawing from the results of the studies measuring the primary effects of Processing Instruction compared to Traditional Instruction, further studies measured the primary effects of Processing Instruction by comparing Processing Instruction to MOI which is, as mentioned previously, a more communicatively-focused output practice (See Table 3.1).

The first study comparing Processing Instruction and Traditional Instruction was carried out by VanPatten and Cadierno (1993) on the acquisition of word order and object pronouns in Spanish. The processing problem under investigation was the "First Noun Principle" (Principle P2, see Table 1.2), according to which learners assign the role of subject to the first noun they encounter in a sentence. VanPatten and Cadierno compared three groups: one receiving Processing Instruction, one receiving Traditional Instruction and a control group. Students were engaged in interpretation and production tasks. The results showed that the Processing Instruction group outperformed the Traditional Instruction group and the control group in interpretation tasks. In production, the Processing Instruction group performed as well as the Traditional Instruction group, and both Traditional Instruction and Processing Instruction were better than the control group. This is the original study which has since been replicated in a number of ways giving rise to rewarding different lines of research.

One of these replications and new area of study includes Cadierno (1995) on the Spanish preterit tense. In this study she investigates the effects of Processing Instruction on a different processing problem (Lexical Preference Principle, P1 b.). This study retained the design (pre-post tests) and the overall aims of VanPatten and Cadierno's original study. Cadierno's study considers the processing problem which affects the targeted form known as the Lexical Preference Principle. The aim of Processing Instruction here, was to push learners to attend to the grammatical

element in the input that might otherwise be missed. Intermediate L2 learners of Spanish (all English native speakers) participated in this study. Processing Instruction was compared to Traditional Instruction on the acquisition of this grammatical feature. As with the previous study, two assessment tests were used an interpretation and written production task.

The results showed that the group who received Processing Instruction was superior to the Traditional Instruction and the control groups in the interpretation task and again as in the case of the first study (Van Patten & Cadierno, 1993) the Processing Instruction group (although never engaged in production type activities during instruction) was able to perform as well as the Traditional Instruction group in the production test. These findings support the hypothesis that Processing Instruction might have an effect in learners' developing system and eventually in their output.

VanPatten and Sanz (1995) investigate the effects of Processing Instruction as measured by three kinds of output tests. They compared a Processing Instruction group to a control group, using the same materials as in VanPatten and Cadierno. Their output tests included not only a sentence-level test but also a question-answer test (based on pictures) and a video-narration test. They administered the output tests in two modes: written and oral. In the video narration, participants had to provide all vocabulary, all syntax, and all grammatical features on their own, without any prompts. VanPatten and Sanz found that the control group did not improve on any tests. The Processing Instruction group improved significantly on the interpretation test and on the sentence-level test in both modes. Their gains were significant in the written mode but just missed significance in the oral mode. In all tests, the Processing Instruction participants performed better on the written tests than the oral.

Buck (2000) investigates the primary effects of Processing Instruction and Traditional Instruction on the acquisition of the present continuous (versus the present progressive) in English. One of the Lexical Processing Principle which has an effect on the linguistic item under investigation in this study is P1.c, the Preference for Nonredundancy principle. L2 learners of English (all native speakers of Spanish) were assigned to three groups: one group receiving Processing Instruction, a second group receiving Traditional Instruction and a control group. Processing Instruction was compared to Traditional Instruction on the acquisition of this grammatical feature. As with the previous studies, two assessment tests were used an interpretation and written production task). The results were similar to those of previous studies and indicated greater gains for the processing group which were maintained over time in the interpretation test.

Benati (2001) conducted an investigation on the effects of two types of Processing Instruction and Traditional Instruction on the acquisition of verbal morphology in the Italian future tense. The impact of the two instructional treatments (Processing Instruction vs. Traditional Instruction and a control group) was investigated on the Lexical Processing Principle (P1 .b) which has an effect on the linguistic item under investigation. Traditional Instruction was operationalised in the same way as in the previous study. In the Processing Instruction treatment, temporal adverbs were removed from the structured input activities so that the learners' attention was directed toward the verb endings as indicator of tense. Therefore learners had to use verbal morphology as indicator of tense since the lexical indicators of tense were absent. This was done to circumvent the processing problem caused by reliance on the lexical item when processing a sentence containing the lexical item and the grammatical feature encoding the same meaning.

Beginners undergraduate students of Italian participated in this study (all

English native speakers). Two assessment tests were used: an interpretation test and two production tests and consisted of an aural interpretation task, a written completion text and an oral limited response production task. The results obtained in this research mirrored those of previous research and provided clear evidence that PI has positive effects on the acquisition of Italian verbal morphology and greater effects on the developing system of beginners L2 learners than instruction of the output-based type.

Cheng (1995; 2002; 2004)) investigates the effects of Processing Instruction on the acquisition of *ser* and *estar,* the two major copular verbs in Spanish. One of the processing principles (P1.c the Preference for Nonredundancy principle) was particularly relevant for this study as copular verbs in Spanish are of low communicative value for L2 learners and are redundant features of Spanish. The study involved L2 learners of Spanish in third year of their University course. Cheng used a very similar research design to that of Van Patten & Cadierno (1993), comparing three groups: a Processing Instruction group, a traditional instruction group and a control group in a pre and post-test format, including three types of tests (Interpretation, Sentence completion, Guided composition).

Her results mirrored those of the original VanPatten and Cadierno study and showed that students receiving Processing Instruction outperformed those receiving no instruction (control group) and Traditional Instruction in the interpretation task. In production, the Processing Instruction group performed as well as the Traditional Instruction group, and both Traditional Instruction and Processing Instruction were better than the control group. Once more the effects of Processing Instruction were observable on output tasks, whereas the effects of the traditional type of instruction were not observable on interpretation tasks.

With the intention of generalizing the findings from previous studies to a

different language and linguistic feature, VanPatten and Wong (2004) carried out a study comparing the effects of Processing Instruction and Traditional Instruction on the French *faire* causative. The processing principle 2, the First Noun Principle (P2), was particularly relevant to this study. L2 learners of French participated in the classroom experiment. As in previous studies investigating primary effects for Processing Instruction, students were assigned to three groups: a processing instruction group, a traditional instruction group and a control group. Again, two separate instructional packets were used but the main difference was that the structured input activities in the Processing Instruction group required learners to process input for meaning and form in order to complete the task. The activities were designed to circumvent the First Noun Principle and learners were never involved in any type of production practice. In the traditional treatment instead learners received the paradigmatic explanation of the target structure and a series of mechanical activities to produce the target forms. The assessment tasks consisted of an interpretation and a production test.

The results confirm the previous findings showing that the Processing Instruction group was superior to the Traditional Instruction group and the control group in the interpretation test and there was no statistical difference between the two instructional groups in the production test.

Have studies investigating a more meaning-based output type of instructions identified similar trends? This is the focus of the discussion which follows.

In his study, Farley (2001a) investigates the effects of Processing Instruction on the Spanish subjunctive with noun clauses. The Spanish subjunctive in nominal clauses after expression of doubt is affected by two processing principles: the Lexical Preference Principle and the Sentence Location principle. Farley compared two groups: one receiving Processing Instruction and one receiving Meaning-based

Output Instruction (MOI). The assessment tasks consisted of an interpretation and a production test. The results confirm that the Processing Instruction group was superior to the MOI group on the interpretation test and there was no statistical difference between the two instructional groups in the production test. These findings reveal that participants who received Processing Instruction, made a significant gain in both interpretation and production abilities with the subjunctive (in form and in use).

Farley (2001b; 2004) used the same design, procedure, and target structure (the Spanish subjunctive mood) as in his 2001a study. The results show that although both groups improved on the interpretation task, only the Processing Instruction group maintained its performance on a delayed task conducted two weeks after treatment. The MOI group declined in performance. Therefore in this study Processing Instruction did prove to be superior to MOI in the long term.

Benati (2005) conducted a parallel classroom experiment investigating the effects of processing instruction, traditional instruction and MOI on the acquisition of the English past simple tense. This study addresses the Preference for Nonredundancy principle. The subjects involved in these two studies were Chinese and Greek school-age L2 learners of English residing in their respective countries. The participants in both schools were divided into three groups: one group receiving processing instruction; a second group receiving traditional instruction and a third group receiving MOI. The assessment tasks consisted of an interpretation and a production test in a pre-test and post-test design (immediate effect only). In both studies the results show that the Processing Instruction group performed better than the Traditional Instruction and MOI groups in the interpretation task and that the three groups made equal gains in the production task.

Morgan-Short & Bowden (2006) investigate the effects of processing instruction and MOI on the acquisition of the Spanish object pronouns. L2 learners of Spanish were assigned to three groups: one group receiving processing instruction, a second group receiving MOI and a control group. The assessment tasks consisted of an interpretation and a production test in a pre-test and post-test design (immediate and delayed effect). The results showed that both experimental groups showed significant gains on immediate and delayed interpretation and production tasks. However, the results also revealed that although both groups improved on the interpretation and production tasks and outperformed the control group, only the Processing Instruction group maintained its performance on a delayed task (one week later). The MOI group declined in performance. Therefore in this study, as in Farley (2001b), Processing Instruction did prove to be superior to MOI in the long run.

At this point it is important to point out that results obtained in a few studies comparing output practice to Processing Instruction, have diverged from those established by VanPatten et al. (e.g., Allen, 2000; Collentine, 1998; DeKeyser & Sokalski, 1996; Erlam, 2003; Salaberry, 1997). These studies have not been reviewed here since VanPatten (2000a, 2002) and colleagues (Farley, 2001a; Sanz & VanPatten, 1998; VanPatten & Wong, 2004) have argued that all failed to operationalise and implement the Processing Instruction versus Traditional Instruction comparison appropriately in one way or another. We share this view. Moreover, all the studies presented above show that Processing Instruction is more effective than Traditional Instruction and MOI in interpretation tasks, and as good as Traditional Instruction and MOI in production tasks (although in the long run Processing Instruction proves to be more effective). The results of the studies summarised in Table 3.1 are very encouraging and reveal the crucial role of input

and the benefits of Processing Instruction in Second Language Acquisition. From these results we can answer the first question raised in the introduction of this chapter: compared to other types of instruction Processing Instruction is highly beneficial to L2 learners and is explained by VanPatten and Cadierno's (1993) original claim that intervention in learner's processing strategies has a significant impact on the learner's developing system.

Table 3.1 Primary effects Processing Instruction vs. Different Types of Instruction (Adapted from Farley, 2004)

Study	Linguistic Feature/ Language	Type of Instruction	Tests	Assessment Tasks & Results
VanPatten & Cadierno 1993	Spanish Object Pronouns	PI vs. TI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = PI > (TI = C) Prod. = (PI = TI) > C
Cadierno 1995	Spanish preterite tense	PI vs. TI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = PI > (TI = C) Pro.= (PI = TI) > C
VanPatten & Sanz 1995	Spanish Object Pronouns	PI vs. Control group	Sentence level test Question answer test Video-narration test (Written & Oral) Pre-test Post-tests Immediate	Int. = PI>C Pro. = PI>C
Buck 2001	English present continuous	PI vs. TI	Interpretation (Aural) Production (Written) Pre-test	Int. = PI > (TI = C) Prod. = (PI = TI) > C

			Post-tests Immediate	
Benati 2001	Italian future tense	PI vs. TI	Interpretation (Aural) Production (Written and Oral) Pre-test Post-tests Immediate & Delayed	Int. = PI > TI > C Pro.= (PI = TI) > C
Farley 2001a	Spanish Subjunctive	PI vs. MOI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = PI > MOI Prod. = PI = MOI
Farley 2001b; 2004	Spanish Subjunctive	PI vs. MOI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = PI = MOI Pro.= PI = MOI
VanPatten & Wong 2004	French causative	PI vs. TI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	Int. = PI > TI > C Pro.= (PI = TI) > C
Cheng (1995; 2002; 2004)	Spanish Ser & Estar	PI vs. TI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = PI > (TI = C) Prod. = (PI = TI) > C
Benati 2005	English simple past	PI vs. MOI	Interpretation (Aural) Production (Written) Pre-test	Int. = PI > TI = MOI Prod. = PI = TI = MOI

			Post-tests Immediate	
Morgan-Short & Bowden 2006	Spanish Object pronouns	PI vs. MOI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	PI = MOI T1: PI = MOI = C T2: (PI = MOI) > C T3: (PI > MOI) > C T1 = pre-test T2 = immediate post-test T3 = one week delayed post-test

PI = Processing Instruction. TI = Traditional Instruction. C = control group.
MOI = Meaning-based Output Instruction.
Int. = Interpretation test; Prod. = Production test.

3.2 Can Processing Instruction be delivered effectively online as well as in classrooms?

More recently, a second line of research on Processing Instruction has focused on measuring the effects of delivering Processing Instruction via different modes (e.g. computer as opposed to pencil and paper). Research carried out to identify whether Processing Instruction would be as effective delivered online as in classrooms, will be now reviewed.

Lee, Benati, Aguilar-Sánchez and McNulty (2007a) compared the effects of delivering Processing Instruction via three different modes: textbook, computer and individualised downloads of computer materials on the Preterite/Imperfect Distinction and Negative Informal Commands in Spanish. The processing problem was one of redundancy (P1c, see Table 1.2).

In this study three variables were manipulated: the mode of delivery (textbook/classroom, computer/ terminals, individualized downloads of computer materials); the linguistic item (preterite/imperfect distinction, negative informal commands), and the time (pre-test, immediate post-test, delayed post-test).

The materials were developed from existing textbook materials (Lee, VanPatten and Ballman, 2000) which were transposed into the virtual environment in order to ensure that the computer materials were as similar to the textbook materials as possible.

The computer materials were downloaded and individualised while paper and pencil material packs for learners were created. Like in previous studies on Processing Instruction, the assessment tasks were designed to measure the effects of delivering Processing Instruction on different linguistic items in Spanish. This was carried out via three different modes of delivery, consisting of an interpretation and a production test in a pre-test and post-test design (immediate and delayed effect).

The results showed no significant interactions involving the modes of delivering Processing Instruction. This confirms that Processing Instruction is equally effective in addressing learners' processing problems regardless of the delivery mode. These findings prove that the instruction itself is what is important to learning, rather than the mode of delivery.

In a second study Lee and Benati (2007a) compare the effects of delivering Processing Instruction and MOI via two different modes: classroom (instructor + students + interaction) and computer (computer + individual student) on the acquisition of the Italian and French Subjunctive.

As in the case of the Spanish subjunctive of doubt, the French subjunctive of doubt presents several processing problems. First of all, there is the Sentence Location processing problem (P1f, see Table 1.1) since it occurs in a subordinate clause that typically follows the main clause of the sentence and is therefore located medially in the sentence. The other processing problem is one of redundancy since the main clause of the sentence, in which speakers choose verb phrases that lexically encode doubt/opinion, is the part of the sentence learners prefer to process.

L2 learners were assigned to four groups (Processing Instruction classroom, Processing Instruction computer, MOI classroom, MOI computer) each receiving the same Explicit Information. The results mirrored those obtained in Lee, Benati, Aguilar-Sánchez and McNulty (2007) and showed no significant differences between the modes of delivering Processing Instruction. This proved further that delivering Processing Instruction in two different modes is equally effective in addressing learners processing problems.

The results of these studies, summarised in Table 3.2, are encouraging and strongly support VanPatten's model of language processing. From these results we can answer the second question of our introduction: Processing Instruction can be delivered with equal effectiveness in both classroom and computer environments.

Table 3.2 Primary effects of Processing Instruction delivered via different modes (Adapted from Farley, 2004)

Study	Linguistic Feature/ Language	Tests	Assessment Tasks & Results
Lee & Benati Aguilar-Sánchez and McNulty 2007a	Preterite/Imperfect Distinction Negative Informal Commands in Spanish	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	PI deliver via Computer = Individualised = Textbook In the following tests: Multiple choice test Negative informal command test
Lee & Benati 2007a	French and Italian Subjunctive	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = PI = PIcomp > (MOI = MOIcomp) Pro.= PI = PIcomp = MOI comp

PI = Processing Instruction. MOI: Meaning-based Output Instruction.
TI = Traditional Instruction; C = control group; MOIcomp = Meaning-based Output Instruction delivered via computer; PIcomp = Processing Instruction delivered via computer
Int. = Interpretation test; Prod. = Production test.

3.3 What are the causative factors in the positive effects of Processing Instruction?

In more recent years, Processing Instruction research has moved away from the original question of whether this instructional approach is more efficient than others and has been extended to identify certain variables which constitute Processing Instruction. These studies test whether the beneficial effects of Processing Instruction should be attributed to the Structured Input component or the Explicit Information component.

As described in Chapter Two, Processing Instruction is comprised of three basic elements, explicit information about the grammatical item, information about processing strategies and structured input activities. In a third line of research, the internal components of Processing Instruction have been tested. This research seeks to establish the causative factor in the positive effects of this successful instructional treatment.

The first study was carried out by Van Patten & Oikkenon (1996) where they investigate whether the results obtained in Van Patten & Cadierno (1993) were due to the Explicit Information component of Processing Instruction, to the positive effects of the Structured Input Activities or to a combination of the two. As in Van Patten & Cadierno (1993), they investigate object pronouns (Spanish) with a group of L2 learners of Spanish. It is important to mention here that the study carried out by VanPatten and Oikennon (1996) was the first to examine younger learners. Participants were teenagers enrolled in their second year in American high school. The materials, design and assessment tasks were also the same as in VanPatten & Cadierno (1993). L2 learners were assigned to three groups: one group receiving only explicit instruction, the other group receiving structured input activities and the third group receiving full Processing Instruction. The three groups were tested

following the same design as Van Patten & Cadierno (1993). The results of this study showed that Structured Input Activities were indeed responsible for learners' gains. The gains made (on both the interpretation and production tasks) by both the Processing Instruction and the structured input activities group were greater than the group receiving only explicit instruction on the Spanish object pronouns. The significance of this study is that the Structured Input Activities group performed as well as the Processing Instruction group. VanPatten (1996:126) indicates that these findings strongly suggest that it is the Structured Input Activities itself and the form-meaning connections being made during input processing that are responsible for the relative effects observed in the present and previous studies. The findings from VanPatten & Oikennon's study converge with all those from other investigations: Processing Instruction is an effective intervention. However, further research is needed in order to establish without a doubt that Processing Instruction is equally as effective with younger learners as it is with older learners.

Benati (2004a) investigates the effects of Processing Instruction, Structured Input Activities and Explicit Information on the acquisition of the Italian future tense. This study addresses the Lexical Preference Principle (P1 b, See Chapter One). The materials, design and assessment measures were the same as in Benati (2001) comparing the effects of Processing Instruction vs. Traditional Instruction on the acquisition of the same linguistic feature. L2 learners of Italian participating in this classroom experiment were divided in three groups: one group receiving only explicit instruction, the other group receiving Structured Input Activities and the third group receiving full Processing Instruction. The results confirmed the findings obtained in VanPatten and Oikkenon's study (1996) and showed that the gains made (on both the interpretation and production tasks) by both the Processing Instruction and the Structured Input Activities group were greater than the group

receiving only Explicit Instruction on the Italian future tense. Once again the Structured Input Activities group performed as well as the Processing Instruction group.

Another replica was conducted by Benati (2004b) on the acquisition of the Italian gender agreement, addressing the Preference for NonRedundancy Principle (P1 c, See Chapter One). L2 learners of Italian at undergraduate level participated in this classroom experiment and were divided into three groups: one group receiving only Explicit Instruction, the other group receiving Structured Input Activities and the third group receiving full Processing Instruction. One interpretation and two production measures were used in a pre and post-test design. Once again the results confirmed the findings obtained in VanPatten & Oikkenon (1996). The Processing Instruction group and the Structured Input group made significant gains on a sentence-level interpretation test and on a sentence-level production test, while the Explicit Information group made no gains. The Structured Input group also made identical gains to the Processing Instruction group in the oral production task, compared to the explicit information group.

Farley (2004b) conducted a study measuring the effects of Processing Instruction and Structured Input Activities only on the acquisition of Spanish subjunctive of doubt where the Sentence Location Principle (P1 f., See Chapter One) and the Lexical preference Principle (P1 b., See Chapter One) are the relevant processing principles. In this study, the materials, design and assessment tasks were the same as in Farley (2001b). L2 learners of Spanish participated in the study and were divided into two groups: one group receiving full Processing Instruction and the other group receiving Structured Input practice. The results were slightly different to previous ones. Both groups made significant improvements from pre-tests to post-tests but the Processing Instruction group outperformed the Structured

Input practice group both in the interpretation and the production task.

Wong (2004b) conducted a study investigating the effects of Processing Instruction, Structured Input practice, Explicit Information only, and a control group in the acquisition of the French negative + indefinite article. In French in a negative statement (*ne…pas*), *de* is used before nouns beginning with a consonant or *d'* before nouns beginning with a vowel. However, because of the Lexical Preference principle (P1 b., See Chapter One), learners will first process *ne…pas* before *de* or *d'* in order to understand French negation.

Intermediate L2 learners of French participating in this study were divided in four groups: one group receiving full Processing Instruction treatment, a second group receiving Structured Input Activities, a third group receiving only Explicit Information and a control group. The results in both the interpretation and the production task showed that both the Processing Instruction group and the Structured Input group were not different and were better than the Explicit Information group and the control group. The Structured Input component seemed, once again, to be the causative factor for the beneficial effects of Processing Instruction.

Lee & Benati (2007a) extend previous research by comparing the relative effects of two types of instructional interventions, Structured Input Activities and Traditional Instruction on the acquisition of the Japanese past tense form. This feature of Japanese was selected because of its processing problem, the Lexical Preference Principle. In a sentence such as *Kinō kaisha ni ikimashita* (Yesterday, I went to the office) both the lexical item *Kinō* and the verb ending *ikimashit*a communicate past tense. Beginners L2 learners of Japanese (all Italian native speakers) participated in the study and were assigned to two groups: one group receiving Traditional Instruction and the other group receiving Structured Input

Activities. The output-based activities in Traditional Instruction required the subjects to produce accurately past tense forms. The Structured Input Activities required learners to interpret sentences containing past tense forms and make form-meaning connections. The findings in this study showed that Structured Input Activities are a better instructional treatment than Traditional Instruction practice as the Structured Input Activities group outperformed the Traditional Instruction group in the interpretation task and both instructional groups improved equally in the production task. Once again these findings confirm the key role of Structured Input Activities practice in Second Language Acquisition.

This study, together with Benati (2005), also sheds light on the issue of generalising Processing Instruction beyond Romance languages. Lee (2004:315) states:

> I am confident regarding the generalizability of Processing Instruction to Romance Languages but reasonable questions could be posed regarding the generalizability of Processing Instruction beyond Romance Languages.

From the consistent findings of Lee and Benati (2007a; 2007b) and Benati (2005) we can therefore conclude that Processing Instruction proves to be an effective intervention in Japanese and English, two non-Romance languages, and these positive outcomes can be attributed to the fact that Processing Instruction focuses on a target language specific processing problem and teaches L2 learners to use the target language appropriate processing strategy.

Benati's study (2005) also points to the effectiveness of Processing Instruction across a variety of native languages. The findings of Processing Instruction are now noted beyond native speakers of English as native speakers of Chinese and Greek were examined in Benati (2005). We can once again attribute the effectiveness of Processing Instruction for native speakers of Chinese and Greek to the fact that Processing Instruction is based on a target language specific

processing problem.

The results are positive and merit further research on the effects of Processing Instruction on non-Romance languages and non native speakers of English.

From the main findings of this third line of research comparing Processing Instruction vs. its components summarised in Table 3.3, the third question raised in the introduction can be answered: the causative factor in the positive effects of Processing Instruction is due to the effects of the Structured Input Activities. This has been proved and observed with regard to different processing principles, languages, linguistic items and assessment task and it reinforces Van Patten's statement (1996:126), that structured input activities and the form-meaning connections made during input processing are responsible for the relative effects observed.

We can therefore conclude from the findings of the studies reviewed in this section and summarised in Table 3.3 that Explicit Information does not play an important role in Processing Instruction and that the particular nature of Structured Input Activities is sufficient to cause improvement in learner performance on a variety of tasks. This can be explained by the fact that, as stated by VanPatten (2002), Structured Input Activities provide the right practice for learners' processing mechanisms (making form-meaning connections) and this facilitates acquisition.

Table 3.3 Research Evidence on the causative factors in the positive effects of Processing Instruction

Study	Linguistic Feature/ Language	Type of Instruction	Tests	Assessment Tasks & Results
Van Patten & Oikennon 1996	Spanish Object Pronouns	PI vs. SIA and EI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = (PI = SI) > EI Prod. = (PI = SI) > EI
Benati 2004a	Italian future tense	PI vs. SIA and EI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate & Delayed	Int. = (PI = SI) > EI Prod. = (PI = SI) > EI
Farley 2004	Spanish regular, irregular and novel subjunctives	PI vs. SIA and EI	Interpretation (Aural) Production (Written and Oral) Pre-test Post-tests Immediate & Delayed	Int. = PI > SI Pro.= PI > SI
Wong 2004b	French negative + indefinite article	PI vs. SIA and EI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	Int. = (PI = SI) > (EI = C) Prod. = (PI = SI) > C PI > EI EI=SI EI = C
Benati 2004b	Italian Adjective agreement	PI vs. SIA and EI	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	Int. = (PI = SI) > EI Prod. = (PI = SI) > EI
Lee & Benati 2007a	Japanese past tense	SI vs. TI	Interpretation (Aural) Production (Written)	Int. = SI > TI Pro.= SI = TI

			Pre-test Post-tests Immediate	

PI = Processing Instruction. TI = Traditional Instruction. C = control group. SI = Structured Input activities only. EI = Explicit Information only.
Int. = Interpretation test; Prod. = Production test.

3.4 Can the positive effects of Structured Input on language development be increased by enhancing it aurally and/or textually?

A current line of research attempts to compare Processing Instruction to other input enhancement techniques in order to investigate whether the positive effects of Structured Input on language development, could be increased by enhancing input aurally and/or textually. Here, the focus is on two areas of investigation: input processing and input enhancement.

As described in Chapter One, VanPatten's theory of Input Processing (1996, 2000a, 2003, 2004a, 2004b, 2007) codified what learners do with the input to which they are exposed according to a set of 2 main principles (Principle 1 and Principle 2) and their sub-principles. To address these processing problems, VanPatten developed Processing Instruction, a comprehensive type of grammar instruction predicated on the model of Input Processing, with Structured Input Activities which aim at helping L2 learners process a greater amount of input. Because of the nature of Structured Input Activities which direct learners to process form for its meaning they are considered as a type of input enhancement. Input enhancement (Sharwood-Smith 1991, Wong 2005) proposes that grammatical forms in the input can be made more salient to learners through a variety of techniques. This new area of research in Processing Instruction measures the effects of structured input activities and enhanced structured input activities in a variety of grammatical items that present processing problems to L2 learners. To date, the languages which have been investigated are Italian, Spanish and Japanese. The linguistic features targeted are

adjective agreement, future tense, past tense, and subjunctive.

Lee and Benati (2007b) investigate the effects of un-enhanced and enhanced structured input tasks on the acquisition of Italian gender agreement and subjunctive of doubt affected by the Preference for Nonredundancy Principle (See Chapter One). L2 learners of Italian (all English native speakers) participated in the study and were randomly assigned to two instructional groups: one group receiving enhanced Structured Input practice and a second group receiving un-enhanced Structured Input Activities. In both treatments learners were asked to pay attention to the adjective endings in the input through structured input practice. The only difference in the two instructional treatments is that in the enhanced treatment, both aural and written stimuli were enhanced. In aural activities the enhancement was obtained by pronouncing the targeted gender agreement ending with a raised voice (louder) and the written activities forms (endings-*o*- and -*a*-) were in bold and underlined so that attention was drawn to the verbal element learners were expected to process. The results of the interpretation and production tasks showed equal success for both practice (enhanced and un-enhanced) in altering the Preference for Nonredundancy Principle and in helping learners to interpret and produce accurate sentences containing the correct adjective agreement forms.

In a similar study Lee & Benati (2007b) investigated the effects of Processing Instruction enhanced vs. Processing Instruction un-enhanced delivered through different modes on the acquisition of Italian subjunctive of doubt affected by the Sentence Location Principle. Intermediate L2 learners of Italian (all English native speakers) participated in the study and were randomly assigned to three groups: one group receiving Processing Instruction, a second group receiving enhanced Processing Instruction and a third group receiving enhanced Processing Instruction delivered via computers. The first group received the Processing

Instruction treatment via classroom instruction; the second group received the same Processing Instruction treatment but with the target grammatical form enhanced; the third group received the Processing Instruction treatment enhanced but via a computer terminal delivery. The results of the interpretation and production tasks confirm that Processing Instruction is an approach equally effective no matter the way the Structured Input Activities are delivered. The results of this study reveal that enhanced and un-enhanced Structured Input Activities have the same positive effects in altering the Sentence Location Principle regardless of their mode of delivery (via classroom instruction or via computers).

In a third study, Lee and Benati (2007b) investigated the effects of enhanced and un-enhanced Structures Input Activities on the acquisition of the Italian future tense. The processing principle under investigation in the case of the Italian future tense is the Lexical Preference Principle (P1 b., See Chapter One). Beginners L2 learners of Italian (all English native speakers) participated in the study and were randomly assigned to two groups: one group receiving enhanced Structured Input Activities and a second group receiving un-enhanced Structured Input Activities. The material for the Structured Input Activities was the same as the one used by Benati (2001, 2004) for both treatments; the only difference being the fact that the forms were un-enhanced for the first group and enhanced in the case of the second group. The results of the interpretation and production tests confirmed previous results and showed that the two instructional treatments equally helped the learner to improve their performance.

A final study conducted by Lee and Benati (2007) investigated the effects of Structured Input Activities enhanced vs. un-enhanced Structured Input Activities on the acquisition of Japanese past tense forms. Once again the processing principle under investigation here is the Lexical Preference Principle (P1 b., See Chapter 1)

which indicates that learners will naturally rely on the lexical item over the verb inflection in order to gather semantic information.

Beginners L2 learners of Japanese (all Italian native speakers) participated in the study and were randomly assigned to three groups: one group receiving Structured Input Activities, another group receiving enhanced Structured Input Activities and a control group. The results of the interpretation and production tasks confirmed once again previous findings and showed that the participants who received both structured input activities and enhanced structured input activities obtained equal statistical results in both the interpretation and the production tests. The two instructional groups were significantly better than the control group.

Overall, the results of the studies reviewed in this section have answered question 4 stated in the introduction by showing that Structured Input Activities, with or without enhancement and regardless of the mode of delivery, are successful in helping learners to process the input better, make better form-meaning connections and produce the target features accurately (See Table 3.4). These studies reaffirm the positive effects of Structured Input Activities as a successful type of input enhancement in altering learners' processing strategy. Consequently, it has a positive effect the learner's developing system. Structured Input Activities are designed with the processing principle in mind and as stated by Wong (2005:76) "stand the most chance at altering learners' inefficient strategies so that optimal input processing can take place". Enhancing the input through input enhancement techniques helps direct L2 learners' attention to grammatical properties. However, it is only through structured input activities that we help learners to make form-meaning connections and cause a change in the learner's developing system. We may conclude that it is the nature of the Structured Input Activities that can cause changes in learner performance.

Table 3.4 Research Evidence on the primary effects of Processing Instruction compared to other input enhancement techniques

Study	Linguistic Feature/ Language	Type of Instruction	Tests	Assessment Tasks & Results
Lee & Benati 2007b	Italian adjective agreement and Subjunctive	SIA vs. Input enhancement techniques	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	Int. = SIA = SIAE Prod. = SIA = SIAE PI = PIE = PIEcomp
Lee & Benati 2007b	Italian future tense	PI vs. Input enhancement techniques	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	SIA = SIAE SIA = SIAE
Lee & Benati 2007b	Italian subjunctive of doubt	PI vs. PIE vs. PIECom	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	PI = PIE = PIECom
Lee & Benati 2007b	Japanese past tense	SIA vs. Input enhancement techniques	Interpretation (Aural) Production (Written) Pre-test Post-tests Immediate	Int. = (SIA = SIAE) > C Prod. = SIA = SIAE) > C

PI = Processing Instruction. C = control group. SIA = structured input activities; SIAE = structured input activities enhanced; PIE = Processing Instruction enhanced; PIECom= processing Instruction Enhanced delivered via computer.
Int. = Interpretation test; Prod. = Production test

3.5 Are the effects of Processing Instruction durative (short-term) and longitudinal (long-term)?

Finally, the latest line of research (although still quite limited) investigates the long-term effects of Processing Instruction or more precisely the longer term effects of

Processing Instruction. The findings of the studies reviewed in the previous sections of this chapter have demonstrated that Processing Instruction is a better approach to output-based approaches to grammar instruction and that Processing Instruction is a very effective approach towards altering inappropriate processing strategies and instill appropriate ones in L2 learners. Until recently Processing Instruction studies examined the short-term effects of Processing Instruction and the (relatively short) long-term effects of Processing Instruction that is from one week to one month. All Processing Instruction studies have an immediate post-test measure to determine whether the Processing Instruction treatment has an effect on acquisition and some studies, described in the previous sections of this chapter, also included a delayed post-test which reported that the effects of Processing Instruction are undiminished for one week (e.g., Cadierno 1995; Lee, Benati, Aguilar-Sánchez and McNulty 2007), two weeks (e.g., Farely 2004a; 2001a; 2001b), three weeks (e.g., Benati 2001; Cheng 2002), one month later (e.g., Benati 2004a; VanPatten and Cadierno 1993)

Considering that Processing Instruction deliberately attempts to affect L2 learners' processing mechanisms the positive effects of Processing Instruction should hold over time. So far, the only study investigating the longer term effects or longitudinal effects of PI was carried out by VanPatten and Fernández (2004). Their study was a replication of VanPatten and Cadierno (1993) but in this study the focus was on the longer term effects (over an eight-month period) of Processing Instruction. In their study L2 learners of Spanish were instructed on the Spanish OVS sentences and clitic pronouns. The instructional treatment, the pre-tests and the post-tests were exactly identical to the ones used in VanPatten & Cadierno (1993).

Pre-tests, instruction and immediate and delayed post-tests were given to the participants. An immediate post-test was given after instruction, and a delayed post-test was given eight months later to the students who had continued on to the next semester and who had completed all phases of the study. When VanPatten and Fernández compared the immediate post-test results to the pre-test results, they found that, as in all other studies, students receiving Processing Instruction improved significantly in both tests. After eight months they found that the effects of Processing Instruction had endured but had also diminished. Even though the scores dropped somewhat on the eight-month delayed test, the students were still significantly better at performing the tests than they were on the pre-test prior to treatment. These findings are remarkable considering the fact that students did not receive any additional instruction or feedback on the target linguistic features over the eight-month period.

These results, summarised in Table 3.5, confirm the longer term effect of Processing Instruction in the case of OVS and clitic object pronouns in Spanish and the first noun strategy. It is quite clear that the longer term effects of Processing instruction need further investigation however, from the results of VanPatten and Fernández, we can answer the fifth question stated in the introduction: at least in this one study, the observed effects of Processing Instruction seem to be durable. This can be explained by the fact that Processing Instruction deliberately attempts to affect L2 learners' processing mechanisms which should hold over time.

Table 3.5 Research Evidence on the longer term effects of Processing Instruction

Study	Linguistic Feature/ Language	Type of Instruction	Tests	Assessment Tasks & Results
VanPatten & Fernández	Spanish Object Pronouns	PI *vs. TI* Focus of the study : to observe the long-term effects of PI	**Pre-test:** **Immediate posttest** : Interpretation (Aural) Production (Written) **Delayed post-test** (8 months later):	Int. = 1.84 Prod. = 1.02 Int. = 6.07 Prod. = 5.87 Int. = 3.31 Prod. = 3.36

3.6 How have the effects of Processing Instruction been measured?

For the most part, the effects of Processing Instruction have been measured using sentence-level interpretation tasks and modified cloze passages for the production tasks. However, some studies, VanPatten & Sanz (1995); Sanz (1997; 2004) and Cheng (2002; 2004) demonstrate that Processing Instruction is effective not only at the sentence level but at the discourse level.

As described previously (See Table 3.1) VanPatten and Sanz (1995) investigate the effects of Processing Instruction on oral language production namely object pronouns in Spanish and compared two groups: one group received Processing Instruction and the second group received no instruction. The pre-test and post-test consisted of three tasks: a sentence-level task, a video-narration task and a question-answer task. Each task had an oral and a written version. The results show that the control group did not improve on any tests whereas the Processing Instruction group improved significantly on the interpretation test and on the sentence-level test in both modes. In all tests, the Processing Instruction participants performed better on the written tests than the oral. From the findings of this study it

appears that the effects of Processing Instruction are observable in a variety of output tests and are not limited to sentence-level tests.

In a study investigating the Spanish preverbal direct object pronoun, Sanz and Morgan-Short (2004) included a sentence completion task and a video retelling task in their production tasks. Processing Instruction proved effective in improving learners' scores on both tasks and the results prove once again that the effects of Processing Instruction are not limited to sentence-level tests.

In Cheng's study (2002) investigating the effects of Processing Instruction on the acquisition of the two principle copula verbs in Spanish: *Ser* and *Estar* (See Table 3.1) three groups were compared: a Processing Instruction group, a traditional instruction group and a control group. Sentence production and a guided composition was used to measure the effects of Processing Instruction. The results mirror the findings of VanPatten and Sanz (1995) and Sanz and Morgan-Short (2004) and show that Processing Instruction proves effective in improving learners' scores on both tasks.

These findings are interesting and further research is necessary to investigate whether Processing Instruction will yield significant improvement on discourse-level tasks. Research should continue to examine whether Processing Instruction will effectively improve the way learners use language to create connected discourse. From these results, we can answer the sixth question stated in the introduction: the effects of Processing Instruction have been measured and are observable in a variety of output tests and are not limited to sentence-level tests.

3.7 Conclusion

In this chapter a review of the research evidence of Processing Instruction has been provided and the results have demonstrated the positive and superior effect

of Processing Instruction in relation to output-based approaches to grammar instruction. Moreover, the results reveal that Processing Instruction can be delivered with equal effectiveness in both classroom and computer environments. In addition, research has identified that the causative factors in the positive effects of Processing Instruction are not due to explicit information provided to learners but solely to the type of Structured Input Activities L2 learners receive.

The findings also validate the fact that Structured Input Activities, with or without enhancement and regardless of their mode of delivery, help L2 learners to process the input better and make better form-meaning connections, producing the target features accurately. Research also demonstrates that the positive effects of Processing Instruction have been measured and are observable in a variety of output tests and are not limited to sentence-level tests. And finally, research has examined and proven the long-term effects of Processing Instruction.

All six questions stated in the introduction have been addressed and we can conclude that:

(1) Processing Instruction is more effective than Traditional Instruction and other types of instruction.

(2) Processing Instruction can be delivered with equal effectiveness in both classroom and computer environments.

(3) The causative factor in the positive effects of Processing Instruction is due to the effects of the Structured Input Activities.

(4) Processing Instruction, with or without enhanced Structured Input Activities and regardless of its mode of delivery (via classroom instruction or via computers), is a successful approach in helping learners to process the input better, make better form-meaning connections and produce the target features accurately.

(5) The positive primary effects of Processing Instruction seem longitudinal (long-term and longer term).

(6) The positive effects of Processing Instruction have been measured and are observable in a variety of output tests and are not limited to sentence-level tests.

As demonstrated in this chapter, research on Processing Instruction has so far focused on measuring its direct and primary effects. The next chapter will serve to deepen the research on the effects of Processing Instruction on Second Language Acquisition and explore, for the first time, the indirect or secondary effects of Processing Instruction by investigating the possible transfer-of-training effects and cumulative transfer-of-training effects of Processing Instruction on the acquisition of French.

CHAPTER FOUR: PURPOSE AND DESIGN OF THE STUDY

Introduction

This chapter will outline the motivation for the present study including the research questions and hypotheses which underpin this research. The design of the present study will be explained together with a presentation of the primary target feature under investigation, the French imperfect tense, the secondary target feature, the French subjunctive of doubt and finally the cumulative target feature, the causative construction with *faire*. Research evidence in the effects of Processing Instruction on these three linguistic features will also be referred to. This will lead to a discussion of the methods and procedures used in the study (participants, materials for the three groups. Finally the tests, procedures and scoring analysis used in the present study will be described.

4.1 Motivation for the Study

Up until this point, we have demonstrated that Processing Instruction is a powerful tool for resolving the processing problems in Second Language Acquisition. The collective empirical evidence on the primary effects of Processing Instruction constitutes a series of convincing proof that Processing Instruction is a viable and superior alternative to other foreign language instructional methods with impressive effects on learning. And from the findings of the studies reviewed in Chapter Three six conclusions were reached (cf. 3.7).

The research on Processing Instruction is more than a decade old and during that time the focus has been to determine the direct or primary effects of Processing Instruction. The findings have systematically proven that Processing Instruction is a very effective approach to grammar instruction in that it teaches L2 learners to alter inappropriate processing strategies as well as helps them instil appropriate ones. In

other words, the main goal of Processing Instruction is to help learners use more efficient strategies to process the input, that is to derive richer intake from the input. Therefore we can conclude that Processing Instruction's goal has been achieved and proven by a long series of research evidence and supported by the following statement from VanPatten & Fernandez (2004: 277):

> During carefully crafted structured input activities, learners receive feedback early on that their processing is incorrect. They realize that what they thought they understood does not match the intended meaning of the speaker. Their internal mechanisms, then, are literally forced to adopt a new strategy and/or abandon the old one. The result is that the accommodation and restructuring mechanisms receive better (in this case, correct) data for internalization.

On one hand, this statement summarises the research on Processing Instruction and its efficiency, but on the other hand it raises further questions. The key point is that, after receiving Proc essing Instruction treatment (working with Structured Input Activities), we should not only notice a positive effect during the Processing Instruction treatments but also after such treatments since it is helping the "accommodation and restructuring mechanisms receive better data for internalization". In other words, should the effects of Processing Instruction treatment only be limited to direct or primary ones?

Therefore is it possible Processing Instruction treatment can have secondary effects on L2 learners and to take this a step further, can Processing Instruction, with its positive effects on L2 learners' developing system, help learners transfer the use of that strategy to other forms without further instruction?

Surprisingly, to date, no study has researched the possible secondary effects of Processing Instruction. It may be time to abandon investigations measuring the primary effects of Processing Instruction and turn to empirical studies investigating its possible secondary effects.

The present study is primarily motivated by VanPatten's work on Input Processing (VanPatten, 1996, 2000, 2003, 2004a, 2004b, 2007) and by a set of 11 hypotheses (Appendix D) generated by Lee (2004) from his critical review of the research on Processing Instruction (Lee, 2004 in VanPatten). In this study three of these 11 hypotheses will be pursued. They are stated below.

> Hypothesis 9. Learners who receive training on one type of processing strategy for one specific form will appropriately transfer the use of that strategy to other forms without further instruction in PI. (Lee, 2004:319)
>
> Hypothesis 10. Learners who receive PI will develop better intuitions about the L2 than learners who receive other types of instruction. (Lee, 2004:320)
>
> Hypothesis 11. The cumulative effects of PI will be greater than its isolated effects. (Lee, 2004:321)

Lee (2004) points out that these hypotheses indicate a robust future for Processing Instruction research. The purpose of this thesis is to examine these possible secondary and cumulative effects of Processing Instruction on the acquisition of French by addressing a series of questions and hypotheses related to Lee's hypotheses 9, 10 and 11. In the next section the research questions and hypotheses will be presented.

4.2 Research questions and hypotheses

The present study examines the primary and possible transfer-of-training effects, both secondary and cumulative, of Processing Instruction on the acquisition of French. The primary target linguistic items (French past tense imperfective aspect, French subjunctive mood morphology and the French causative with *faire*) were compared using Processing Instruction and Traditional Instruction and a control group, which, for comparison purposes, did not receive instruction. The following research questions that guide this study are framed in terms of this comparison and consequently they are as follows:

Q1.What are the primary effects of Processing Instruction and Traditional Instruction on the acquisition of French past tense imperfective aspect as measured by an interpretation task?

Q2. What are the primary effects of Processing Instruction and Traditional Instruction on the acquisition of French past tense imperfective aspect as measured by a production task?

Based on previous empirical evidence and findings presented in Chapter Three on the primary effects of Processing Instruction and Traditional Instruction in Second Language Acquisition, the following hypotheses related to Questions 1 and 2 have been formulated as follows:

H1: Processing Instruction will be a more effective type of instruction than Traditional Instruction in helping learners to interpret correctly and efficiently sentences containing French past tense imperfective aspect.

H2: Processing Instruction will be an equally effective type of instruction to Traditional Instruction in helping learners to produce correctly and efficiently sentences containing French past tense imperfective aspect.

As previous research has clearly and consistently demonstrated that Processing Instruction has direct and primary effects on learners, helping them to alter inappropriate processing strategies, the main aims of the present study, are to discover whether the positive and primary effects of Processing Instruction could be transferred by L2 learners to other features affected by the same principle without further training. The main objective of the present study was to examine the possible transfer-of-training effects, both secondary and cumulative, of Processing Instruction. The research questions are as follows:

Q3. Are there any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense

imperfective aspect to French subjunctive mood morphology as measured by an interpretation task?

Q4. Are there any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French subjunctive mood morphology as measured by a production task?

To date, no research has been carried out to investigate the possible transfer-of training of Processing Instruction. However, the following hypotheses related to questions 3 and 4 have been formulated as follows:

H3: Learners receiving Processing Instruction on French past tenses imperfective aspect will transfer that training and process subjunctive mood morphology better than those receiving Traditional Instruction as measured by an interpretation task.

H4. Learners receiving Processing Instruction on French past tenses imperfective aspect will transfer that training and process subjunctive mood morphology better than those receiving Traditional Instruction as measured by a production task.

The other main objective of the present study was to discover whether the positive and primary effects of Processing Instruction could be transferred by L2 learners to other linguistic features affected by a completely different processing problem in order to investigate whether there are cumulative transfer-of-training effects for Processing Instruction. The research questions are as follows:

Q5. Are there any cumulative transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French causative constructions with *faire* as measured by an interpretation task?

Q6. Are there any cumulative transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense

imperfective aspect to French causative constructions with *faire* as measured by a production task?

Again, no research has been carried out to investigate the possible cumulative transfer-of-training of Processing Instruction. However, the following hypotheses related to questions 5 and 6 have been formulated as follows:

H5: Learners receiving Processing Instruction on the French past tense imperfective aspect will transfer that training and process French causative constructions with *faire* better than those receiving Traditional Instruction as measured by an interpretation task.

H6: Learners receiving Processing Instruction on French past tense imperfective aspect will transfer that training and process French causative constructions with *faire* better than those receiving Traditional Instruction as measured by a production task.

4.3 Design of the study

The research undertaken in this thesis establishes a unique line of research within the Processing Instruction model by assessing the transfer-of-training of this approach to grammar instruction. The classroom experimental study has been designed to investigate the possible transfer-of-training effects (secondary transfer-of-training and cumulative transfer-of-training) of Processing Instruction on the acquisition of French. Primary effects are those that result directly from a targeted linguistic form and transfer-of training effects are those that result indirectly (are applied to or transferred to) another form.

The present study examines secondary effects by measuring whether learners receiving Processing Instruction on the French imperfect tense, the primary linguistic target, can transfer the instructional training they receive to the

acquisition of other forms of French. More specifically, the aim of this study is to measure secondary transfer-of-training effects on the acquisition of the French subjunctive used for expression of doubt and cumulative transfer-of-training effects on French causative constructions with *faire*. Both French imperfect and French subjunctive present second language learners with a processing problem described by VanPatten (2004b) as, principle 1b, the Lexical Preference Principle (See Table 3.1 and Table 3.2). Because the processing problem is the same for the two forms, we refer to the transfer-of-training effects as secondary. The French imperfect and French causative with *faire* involve two extremely different processing problems described by VanPatten (2004b) as, principle 1b, the Lexical Preference Principle and principle 2, the First Noun Principle (See Table 3.1 and Table 3.3). As we are addressing different processing problems, we refer to the transfer-of-training effects as cumulative.

This classroom experimental study investigates the possible transfer-of-training effects of two types of form-focused instruction on the acquisition of past imperfective aspect, subjunctive mood, and causative constructions in French. Processing Instruction (input-based) will be compared to traditional (output-based) instruction. Three groups will be used. One receiving Processing Instruction, one receiving Traditional Instruction and the third, serving as a control group, which did not receive instruction on the three target linguistic items over the duration of the investigation. The next section explains the nature of these three linguistic features and the processing principles associated with them.

4.3.1 The Target Linguistic Features

4.3.1.1 Primary Target Feature: French imperfect tense

The French imperfect past tense was chosen as the primary linguistic feature to investigate as it has never been examined in previous Processing Instruction research, unlike the Spanish past tense imperfective aspect which was studied by Lee, Benati, Aguilar-Sánchez and McNulty (2007). The acquisition of this form is affected by The Lexical Preference Principle, Principle (1.b), which states that learners tend to process lexical items as opposed to grammatical form when both encode the same semantic information (See Table 4.1). The processing problem facing second language learners of French is that they may not attend to the verbal inflections in the input if they were co-referenced with lexical temporal/aspectual adverbials. Learners prefer to process the lexical items over the grammatical forms. They do not need to process both because they both encode the same information.

A potential consequence of this processing problem is that learners might come to rely exclusively on the lexical forms in the input, meaning they would not process the grammatical markers. If they do not process the grammatical marker, then they could not possibly acquire it (Lee 1999). The following sentence serves as an example. The temporal/aspectual adverbial is underlined and the temporal aspectual morphology is in bold.

(1) Pendant les vacances d'été, Paul dorm**ait** toute la journée.

During the summer vacation, Paul would sleep all day long.

Second language learners might come to rely on the lexical phrase that indicates a past time frame for the aspectual information and fail to process the grammatical marker (*-ait*). The primary linguistic target is also affected by a second processing problem described by VanPatten (2004b) as principle 1f, the Sentence Location Principle (See Table 4.1). From an input processing perspective, it matters whether

a form occurs in sentence initial, medial or final position with sentence initial position being the most favoured processing position of the three. As seen in both sentences above as well as in the following sentence, the imperfect form frequently occurs in sentence medial position, the least salient processing position which means that learners are not likely to detect it.

(2) La semaine dernière Marie ne voul**ait** plus partir.

Last week Marie did not wish/want to leave anymore.

Table 4.1 Summary of the Processing Principles for the French past tense imperfective aspect

Targeted linguistic feature	Processing Principle(s)
French past tense, imperfective aspect	P 1b. 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. 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.

4.3.1.2 Secondary Target Feature: French Subjunctive of doubt

The subjunctive mood morphology in French was chosen as a secondary target item for the principal reason that it is affected by the same processing principles as the French past tense imperfective aspect, specifically, the Lexical Preference Principle and the Sentence Location Principle (See Table 4.2). In the following sentence, the lexical expression of doubt that triggers subjunctive use is underlined and the subjunctive morphology is in bold.

(3) Je <u>doute</u> que Paul vie**nne** avec nous.

I doubt that Paul will come with us.

This particular structure is often considered difficult for native speakers of English learning a Romance language. The subjunctive, with the exception of a few fixed expressions and certain constructions, occurs in clauses introduced by *que* or by conjunctions ending in *que* (e.g. *quoique* "although"). We have selected to investigate the acquisition of the present subjunctive mood morphology in dependent nominal clauses introduced by *que* after expressions of doubt because this form has been investigated in previous Processing Instruction research (Farley 2001a ; Lee and Benati 2007a ; 2007b). The French subjunctive of doubt functions in a very similar way to the subjunctive of doubt in Spanish and Italian. It occurs in nominal dependent clauses after expressions of doubt in the main clause. Such expressions include "Je doute que" (*I doubt that*) and "Je ne crois pas que" (*I don't believe that*). It also occurs in interrogatives expressing doubt from the speaker perspective. For example, in French "Penses-tu que...?" (*Do you think that...?*) would be followed by a nominal dependent clause in which the verb form would be the present subjunctive mood. By way of contrast, expression of certainty would not trigger the use of the subjunctive mood but would use the present indicative in the dependent clause. Such expressions include, "Je crois que..." (*I believe that*) and "Je suis sûr(e) que..." (*I am sure that*).

The acquisition of the French subjunctive, as in the case of French imperfect, is affected by the Lexical Preference Principle (P1 b). In French the mood in the subordinate clause is indicated as a verb final morphological marker. This morphology is triggered by the meaning of a verb or verb phrase in the main clause. The subjunctive form in the dependent clause is, therefore redundant and nonmeaningful. In addition to the Lexical Preference Principle, this use of the subjunctive is also affected by two other principles (See Table 4.2).

P 1c. The Preference for Nonredundancy Principle: learners are more likely to process nonredundant meaningful grammatical form before they process redundant meaningful forms.

P 1d. The Meaning-Before-Nonmeaning Principle: learners are more likely to process meaningful grammatical forms before nonmeaningful forms irrespective of redundancy. (VanPatten 2004b: 11)

In the sentence (4) the word "*doute*" exclusively expresses the idea of doubt.

(4) Je doute qu'il vienne.

I doubt that he will come.

The form of the verb "*vienne*" lacks meaning and is redundant. All learners need to extract from "*vienne*" is its meaning, not its form. As Lee (1987, 1998) illustrates with the Spanish subjunctive, learners do not need to attend to the subjunctive form of the verb in the nominal clause to understand the meaning of either the verb or the sentence.

Additionally, the subjunctive may be affected by an additional processing problem captured by Principle 1f: The Sentence Location Principle. In the majority of French utterances of the type discussed here, the subjunctive form tends to occur in medial position in the dependent clause. This positioning contributes to the likelihood that second language learners would not process it. For example, in the utterance in (5) the subjunctive inflection (the *–enne* of *comprenne*) is found in the middle of the clause, therefore perceiving the form would be challenging for second language learners.

(5) Je ne crois pas qu'elle compre**nne** la situation.

I do not believe she understands the situation.

Table 4.2 Summary of the Processing Principles for the French subjunctive of doubt

Transfer-of-training linguistic feature	Processing Principle(s)
French subjunctive mood	P 1b. **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. P 1c. **The Preference for Nonredundancy Principle**: learners are more likely to process nonredundant meaningful grammatical form before they process redundant meaningful forms. P 1d. **The Meaning-Before-Nonmeaning Principle**: learners are more likely to process meaningful grammatical forms before nonmeaningful forms irrespective of redundancy. 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.

4.3.1.3 Cumulative Target Feature: French Causative Construction with *faire*

The French causative was chosen in this study in order to measure possible cumulative transfer-of-training effects for Processing Instruction. To do so requires a form affected by a different processing principle, and in this case, the First Noun Principle will be referred to. We also chose to investigate this structure because it has been investigated previously in Processing Instruction research (Allen, 2000, VanPatten and Wong, 2004).

The First-Noun Principle (P2) states that "learners tend to process the first noun or pronoun they encounter in a sentence as the subject/agent." (VanPatten 2004b: 18). Learners assign the role of agent/subject to the first noun or pronoun they encounter in a sentence even if this noun or pronoun is not the agent or is not the

subject. While French is considered an SVO language, that is, its word order is subject (S) verb (V) object (O), other word orders are possible. The difficulty for second language acquisition is that when learners misassign the role of the first noun or pronoun, they are delivering erroneous intake to the developing system.

Research has also shown that the First-Noun Principle accounts for how learners initially process the French causative. The causative generally takes the form seen in examples (6) and (7) (adapted from VanPatten & Wong, 2004). What appears on the surface to be a compound verb with one subject is not. It is a complex verbal construction for which there are two agents.

(6) Charles fait promener le chien à Emma.

Charles makes to walk the dog to Emma

Charles makes Emma walk the dog.

(7) Nos professeurs nous font travailler beaucoup.

Our teachers us make work hard.

Our teachers make us work hard.

The first verb is *fait* with its obligatorily preposed subject *Charles*. The second verb is *promener* with its subject, *Emma*, obligatorily placed after the verb and marked by the preposition *à*. At the surface level this noun appears as the object of the preposition *à*. It is assigning the subject to the second verb that presents the processing problem to second language learners of French. If we ask learners "Who walks the dog?" they respond that "Charles" is walking the dog since he is the first noun in the sentence. And if we ask learners to give a translation of the sentence they will indicate that it means something like "Charles walks the dog for Emma." or "Charles walks Emma's dog." In (7) the causative structure is somewhat different because the underlying agent of the second verb appears before the verb; not as a subject pronoun but as an object pronoun. In (7), if we ask learners "Who

works hard?" they will tend to say "Our professors", once again demonstrating their reliance on the first noun processing strategy. And if we ask learners to give a translation of the sentence they will indicate that it means something like "My teachers work hard for me." What is very problematic for acquisition is that learners are apparently not processing the verb *faire* in these constructions. They hold the first noun as the subject and then find the next meaningful element, the second verb, to link with the subject. They then misinterpret *à* in a variety of ways.

But it is important to note that learners may make correct interpretations even though they may not be able to process all the sentence constituents correctly. According to VanPatten and Wong (2004:101) and as described in Chapter 1, learners may rely on the lexical semantics and event probabilities instead of word order to interpret causative sentences correctly. As defined by VanPatten & Wong (2004: 99):

> Lexical semantics refers to what verbs require as agents for the action to occur (e.g. +/- animacy) while event probability refers to the likelihood of events in the real world.

Event probability would affect how learners would process French causatives with *faire*. For example, if learners heard a French causative sentence such as (8), taken from VanPatten & Wong (2004:99) event probabilities would help them to formulate a correct interpretation.

(8) *Le professeur fait faire les devoirs à ses élèves*

The professor makes to do the homework to his/her students.

The professor makes his/her students do homework.

In the real world, learners are more likely to think that the students are doing homework for the professor and not that the professor is doing homework for the students. The real world delineates clearly prototypical professor/student roles.

Table 4.3 Summary of the Processing Principles for the French Causative Constructions *with Faire*

Cumulative Transfer-of-training linguistic feature	Processing Principle(s)
French causative constructions with *faire*	P 2. **The First Noun Principle**. Learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent. P 1a. **The Primacy of Content Words Principle**: learners process content words in the input before anything else.

In this section the three target linguistic features and their processing principles were presented and in the next section we will give a more specific account of the research evidence on the primary effects of Processing Instruction on these specific three linguistics features.

4.4 Research Evidence on the Effects of Processing Instruction on the Imperfect, the Subjunctive and the Causative.

4.4.1 Empirical studies on the effects of Processing Instruction on the past tense imperfective aspects.

The past tense with imperfective aspect in French has never been investigated in previous Processing Instruction research to date, although Spanish past tense imperfective aspect has (Lee, Benati, Aguilar-Sánchez and McNulty 2007). Lee, Benati, Aguilar-Sánchez and McNulty (2007) examined the effects of Processing Instruction delivered in a classroom to the entire group, Processing Instruction delivered individually on a computer, and Processing Instruction delivered individually in a classroom. For the latter treatment they downloaded the computer screens of the Processing Instruction-computer treatment and used them as individualised work packs in a classroom. They investigate both negative informal commands and past tense preterite/imperfect aspectual distinction in Spanish. The preterite is used to express perfective aspect whereas the imperfect is used to express imperfective aspect. In their study, the subjects had already been taught the preterit and were receiving for the first time instruction on aspectual distinction. For both target linguistic items, they found no significant differences across the three different Processing Instruction treatments. They concluded that Processing Instruction could be delivered effectively in classrooms to a group, on computers to individuals, or in classrooms to individuals.

4.4.2. Empirical studies on the effects of Processing Instruction on the Subjunctive

Previous investigations of the effects of Processing Instruction on the acquisition of subjunctive verb morphology have all demonstrated that Processing Instruction brings about significant improvement on learners' performance on

interpretation and production tasks (Farley 2001a, 2004a, 2004b; Lee and Benati 2007).

Farley (2001a) compares the effects of Processing Instruction and MOI on the Spanish subjunctive. He found that the Processing Instruction group significantly outperformed the MOI group on the interpretation test, but that the two groups performed equally well on the production test. In Farley (2004a) he replicated his 2001a study but with a bigger number of participants, 67 instead of 29. This time he found no differences between the effects of the Processing Instruction and MOI groups on either the interpretation or production task. Both groups improved significantly and performed equally well. Farley (2004b) examined the relative effects of full Processing Instruction and Structured Input on the acquisition of Spanish subjunctive. Both groups made significant improvement on the interpretation and production tasks, but the full Processing Instruction group made better gains than the Structured Input group.

Lee & Benati (2007a) investigates the effects of Processing Instruction and MOI, delivered either in classrooms or on computers, on the acquisition of Italian and French subjunctive of doubt/opinion. The findings for the two languages were identical. Learners who received Processing Instruction performed better than those who received MOI on the interpretation test. Both groups performed equally well on the production test. There were no significant differences in interpretation and production scores between learners who received classroom instruction and learners who received individualized computer instruction. They concluded that Processing Instruction was a more effective instructional treatment than MOI given the differences on the interpretation test and that computers can effectively deliver Processing Instruction. They can deliver it as effectively as classroom instructors.

Lee and Benati (2007b) investigates the effects of Processing Instruction and textually enhanced Processing Instruction delivered either in a classroom or via computer on the acquisition of Italian subjunctive of doubt/opinion. In the enhanced Processing Instruction treatments, the target forms received acoustic enhancement (louder) if the input was aural or textual enhancement (in bold) if the input was written. They found no statistically significant differences across the three treatments on either production or interpretation tests. All three types of Processing Instruction were effective at improving learners' interpretation and production of Italian subjunctive forms. They concluded that structured input could not effectively be enhanced any more than it is. Structuring input makes the form as salient to the learner as the form can be. Additionally, they concluded that computers can deliver Processing Instruction just as effectively as classroom teachers.

4.4.3. Empirical studies on the effects of processing instruction on causative

VanPatten and Wong (2004) investigate the effects of Processing Instruction, Traditional Instruction and a control group on the acquisition of the French causative constructions with *faire*. Their intent was to replicate Allen (2000) but with the idea of controlling the input for event probabilities as discussed above and to remove other items in the post-tests (VanPatten and Wong 2004:111). They used a pre-test/post-test design. The results of the interpretation task showed that both the Processing Instruction and Traditional Instruction groups improved significantly more than the control group and that the Processing Instruction group improved significantly more than the Traditional Instruction group. This study is unique in finding that a Traditional Instruction group improved on the interpretation task. For the production task, they found that both Processing Instruction and Traditional Instruction groups improved equally and that both improved significantly more than

the control group. Their results differ quite a bit from Allen's. VanPatten and Wong conclude that replication studies are important in second language acquisition research. Differences in assessments and treatments may well yield differences in outcomes.

4.5 Methods and Procedures

4.5.1 Participants

The present study was carried out at the University of Greenwich with a final sample size of twenty-eight undergraduate students who were enrolled in intermediate-level French course (level 2), as part of their undergraduate degree. Participants completed an informational/consent form and were given the six pre-tests (two per target linguistic feature) two weeks before the instructional treatments took place. The information/consent form is given in Appendix A. The instructional treatment lasted for one class period of two hours and post-tests were administered immediately after the end of the instructional treatment. The activities in both treatments were delivered in the classroom by the researcher. The initial subject pool (45) was reduced to twenty-eight subjects as, for the validity of the study, only English native speakers of English were included. Additionally, the subjects should not have been exposed in the classroom to any of the three targeted linguistic items before the treatment. Subjects who scored more than 50% in the pre-tests (interpretation and production tests) were not included in the final pool. The three immediate post-tests on the three grammatical features were administered to the three groups immediately after the end of instruction. Only participants who had participated in each stage of the experiment (pre-tests, instructional treatment, and post-tests) were included in the final data collection.

The final pool (reduced from 45 to 28 subjects) consisted of 10 males and 18 females ranging in age from 18 to 25 years old. Students were randomly assigned to three groups: one group receiving Processing Instruction (*n*= 13), another group receiving Traditional Instruction (*n*=9) and a control group (*n*=6). Participants were tested on their ability to interpret and to produce the three linguistics target features (imperfect, subjunctive of doubt, and causative construction with *faire*) at sentence level.

4.5.2 Materials

Two separate instructional packs were designed for this study, one for the group receiving Processing Instruction instructional treatment and one for the group receiving Traditional Instruction treatment. These instructional packs are given in Appendix B.

The materials addressed the French past tense called the "imparfait." The materials developed for the Processing Instruction group consisted of explicit information about the forms and function of the imperfective past tense, information about processing strategies, and structured input activities as practices. During the Processing Instruction treatment, learners were taught how to process input sentences and assign meaning to the target form. The instructional pack for Processing Instruction instructional treatment is given in Appendix B1.

The Traditional Instruction group received a type of instruction which consisted of a more traditional grammar explanation of rules and forms and mechanical and meaningful practices that required learners to produce the target form. The instructional packet for Traditional Instruction treatment is given in Appendix B2.

Both sets of instructional materials were balanced for vocabulary, activity types, number of activities and practice time. The vocabulary used and the verbs

targeted were roughly the same in both treatments. The choice of vocabulary and verbs consisted of familiar and frequent items for intermediate L2 learners of French.

As in VanPatten and Cadierno (1993), the first page of both packs contained explicit grammar explanation about the *imparfait*. The two groups received the same amount of information about how to form and use the imperfect in French. The Explicit Information differed, however, in the way it was practiced. The Processing Instruction treatment practice focused on comprehension/interpretation activities, whereas the Traditional Instruction treatment practice focused on production activities. The difference between the activities in the processing and traditional group can be summarised as follows. The Structured Input Activities in the processing group required participants to attend to both meaning and form to successfully complete the activities but the learners were never required to produce the target forms. The activities in the traditional pack required learners to produce the target forms. These production activities moved from mechanical to meaningful. Mechanical activities do not require participants to attend to meaning to successfully complete the activity whereas meaningful activities do.

Although the Explicit Information was different in the two instructional treatments, the time allocated to grammatical explanation was exactly the same in the two treatments. In both treatments, ten activities followed the presentation of the explicit information. The first five activities focused on the third person singular (-*ait*). After completing these activities, participants again received explicit information about the target form, but this time focusing on the ending of the 1st and 2nd person of the singular (-*ais*). These two endings are homophonous in French. This Explicit Information was followed by five more activities; Structured Input Activities in the processing group and mechanical and communicative activities in the traditional group.

4.5.3 Processing Instruction Treatment

The material for the Processing Instruction treatment reflects one approach to the teaching of grammar which encourages L2 learners to focus their attention on the French imperfect forms in the input. In the presentation of the target item the relation between form and meaning was always in focus. In addition to the Explicit Information regarding forms and functions of the past imperfective tense, the Processing Instruction group received information about the processing problems (See Appendix B1). Lexical items like "l'année dernière" (last year) which communicate the past timeframe encourage learners to leave past tense markers undetected in the input as learners tend to rely on lexical cues over grammatical forms to encode semantic information. In the Processing Instruction materials, all lexical cues to the past and imperfective aspect were removed. Never during instruction were students in the Processing Instruction group asked to produce the correct verb inflection in the French imperfect. Rather they were engaged in processing input sentences so that they could make better form-meaning connections.

In the material pack for the Processing Instruction group the activities comprised of Structured Input Activities as described by Lee and VanPatten (1995; 2003) that consisted of both referential and affective activities. Referential activities, as described in Chapter Two, are those meaning-based activities with right or wrong answers as in Activity A in Figure 4.1. For this activity, the subjects heard a series of sentences, each of which had Zinédine Zidane as the grammatical subject. The learners were asked to tick boxes to indicate whether the statement they heard about Zinédine Zidane was referring to his past life as a professional football player or his current life as a retired football player. The only way to correctly decide to which part of his life the sentence referred was to process the verbal inflection and use it. It was either past or present. To add another layer of meaning learners had to do

something with the input, one of the six guidelines for creating structured input activities also described in Chapter One (Lee and VanPatten 1995, 2003). Learners were asked to indicate if Zinédine Zidane was busier as a professional football player than he is as a retired football player.

Figure 4.1 Example of Referential activity used in the material for the Processing Instruction treatment

Activity A: Zinédine Zidane: avant et après…

Step 1:

Listen to the following statements made by a journalist about the life of Zinédine Zidane and decide whether each statement is referring to his past life as a professional football player or his life now as a retired football player.

	Professional football player	Retired football player
1	❑	❑
2	❑	❑
3	❑	❑
4	❑	❑
5	❑	❑
6	❑	❑
7	❑	❑
8	❑	❑

Step 2

Now decide if Zinédine Zidane was busier when he was a professional football player or now that he is retired.

Sentences heard by learners:

Zinédine Zidane…

1 … jouait au football dans le monde entier
2 … gagnait beaucoup de coupes.
3 … passe du temps avec sa famille.
4 … participait à beaucoup de diners officiels.
5 … s'entrainait avec Ronaldo.
6 … s'occupe de ses enfants.
7 … est directeur de l'association ELA.
8 … marquait beaucoup de buts.

In Affective activities, as described in Chapter Two, students offer a personal reaction to a statement or sentence by indicating, among other things, whether or not it is true for them or some other reference group with which they are familiar. In Activity B in Figure 4.2, for example, learners read a series of statements about teenagers' actions. All the items used the target form. They were asked to tick boxes to indicate whether a parent, a relative, and/or their instructor would have carried out any of the statements they read. Meaning is kept in focus because the learners are relating the information to the people they know. Another layer of meaning is included in this activity in that the learners get to find out if they were accurate about their instructor's teenage years. Processing strategies are kept in mind because none of the sentences contain a lexical adverbial to cue tense and aspect.

Figure 4.2 Example of Affective activity used in the material for the Processing Instruction treatment

Activity B (adapted from Farley, 2004): In their teens...

Step 1

Imagine what your parent's life was like as a teenager many years ago. What about another relative and your instructor? Can you imagine who partied too much? Who argued with his/her teacher a lot? Read over each statement and decide whether each individual (parent, relative or instructor) would have been doing these things or not.

Il/Elle...

		Parent	Relative	Instructor
1	... se disputait avec son professeur.	❑	❑	❑
2	... ne passait pas son baccalauréat.	❑	❑	❑
3	... trichait aux examens.	❑	❑	❑
4	... avait de très bonnes notes.	❑	❑	❑
5	... buvait de l'alcool à 15 ans.	❑	❑	❑
6	... faisait la fête toute la nuit.	❑	❑	❑
7	... visitait beaucoup de pays.	❑	❑	❑
8	... organisait des soirées étudiantes.	❑	❑	❑

- **Step 2** Find out if your instructor used to do any of the above. Are you surprised?

Feedback during the instructional treatment was quite limited and restricted. On the Referential activities, the instructor informed the learners whether their interpretations were correct or not but did not offer any further information on the item nor offered further explanation. As can be seen in both Activities A and B, learners never have to produce the target form in order to accomplish the activity. An important point to make about the structured input activities is that the target form is presented in as salient a position as possible. By removing the subject noun or pronoun we are able to place the target form in initial position, the most favoured processing position. This is in order to help L2 learners to make correct form-meaning connections.

4.5.4 Traditional Instruction Treatment

The instructional packet used for the Traditional Instruction treatment reflects a different approach to the teaching of grammar. More traditional approaches involve the paradigmatic presentation of the French imperfect, all persons, all forms regular and irregular. The Traditional Instruction group was not given any information about processing problems, the tendency to rely on lexical items or information about listening for the forms in the input because this information is not part of traditional approaches to grammar instruction. An instructor not versed in Processing Instruction would not treat processing problems during a grammar explanation. Subsequent to receiving Explicit Information on the French past imperfective tense, all practice was oriented to producing the correct verbal inflection (See Appendix B2).. All the activities used for the implementation of this approach were constructed to make learners produce the target form in either oral or written mode. The activities included the following types of practice: fill-in-the-

blank tasks, sentence completion tasks, traditional substitution drills and transformation tasks.

As in VanPatten and Cadierno's original Processing Instruction study (1993), activities in the traditional pack followed the pattern of moving from mechanical to meaningful and then to communicative practice. Activity C in Figure 4.3, for example, is a mechanical output practice. The learners begin by conjugating a set of verbs to describe their instructor's activities. The truth value of the statements is not addressed. The correct answer is the correct form of the verb. The next activity moves to conjugating a set of verbs that describe what some did during the last summer vacation. Again, the truth value of the statements is never at issue. The sentence is correct if the form of the verb is correct.

Figure 4.3 Example of mechanical output practice activity used in the material for the Traditional Instruction treatment

Affective Activity C ***In their teens…***

Imagine what your instructor's life was like as a teenager many years ago. Use the verbs below to write sentences about things she did in her teens.

Cécile (se disputer) _____ *souvent avec son professeur.*

Elle (passer) _____ *ses vacances avec des amies.*

Elle (tricher) _____ *aux examens.*

Elle (avoir) _____ *de très bonnes notes.*

Elle (boire) _____ *de l'alcool à 15 ans.*

Elle (faire) _____ *la fête toute la nuit.*

Elle (visiter) _____ *beaucoup de pays.*

Elle (organiser) _____ *des soirées étudiantes.*

For Activity D in Figure 4.4, learners are to transform a series of sentences that refer to the present activities of a fictitious person into a series of sentences that refer

to what the person used to do before. Most of the items are meaningful in that the information contained in the sentence would have to change somewhat to accommodate the different life circumstances of her past. Feedback during the instructional treatment was quite limited and restricted. The instructor only told the learners if the forms they produced were correct or not but did not offer any further information on the item nor provide further explanation of the French past imperfective tense.

Figure 4.4 Example of mechanical output practice activity used in the material for the TI treatment

Activity D: Here are some things Caroline is doing today. Follow the model and state what she used to do or how she used to be.

MAINTENANT

1 .Elle pèse 55 kilos.

2. Elle fait une taille 38.
3. Elle ne fume pas.
4. Elle travaille beaucoup.
5. Elle a besoin de 1500 calories par jour.
6. Elle vient au travail en vélo.
7. Elle a besoin de manger peu.
8. Elle parle de se marier.

AVANT

Elle pesait 105 kilos

_____
_____
_____
_____
_____
_____
_____

4.5.6 Control Group

The control group received no instruction on the primary, secondary or cumulative target features during the treatment period but were exposed to a comparable amount of the target language for the same amount of time as the treatments lasted.

4.5.7 Tests

Pre-test and post-tests were developed for measuring the primary effects of instruction on the first feature (French past tense imperfective aspect), the secondary transfer-of-training effects on the second feature (French subjunctive mood morphology), and the cumulative transfer-or-training effects on the third feature (French causative constructions with *faire*). These tests are given in Appendix C. Pre-tests and post-tests consisted of a sentence level interpretation task and a sentence level production task for each of the three linguistic features.

An example of an interpretation test for the primary linguistic target is given in Appendix C1. It consisted of twenty recorded sentences. Ten contained targets and the other ten, written in the present tense, served as distracters. The items were recorded by a native speaker of French and presented to the subjects on a CD player. The interpretation task required participants to listen to a series of sentences about people doing various activities and to determine whether the action was in the present or in the past. For example, participants heard the sentence *Emma parlait au téléphone* (Emma was speaking on the phone) and then had to decide whether the sentence expressed "present", "past" or they were "not sure". They were given the option of indicating whether they were 'not sure' to discourage guessing. The different versions of the tests were balanced in terms of difficulty and vocabulary used with a tendency to favour the use of high frequency items. Subjects received 1 point if the target sentence was interpreted correctly and 0 points if they were wrong or they were not sure how to interpret the sentence correctly. The maximum score possible was 10 points with a minimum possible score of 0 points. Only target items were scored, not the distracters. Each item was read only once.

In the production task, learners had to fill the blanks in a short passage by producing the correct form of the verb. An example of a production test for the

primary linguistic target is given in Appendix C1. Scoring for the production task consists of a 2, 1, 0 point system for a possible maximum score of 20 points. A participant received 2 points if the sentence completion contained a verb in the correct past tense form. If the verb was in the past tense but with the wrong person or if the learner had switched verb category endings, a score of 1 point was allocated to the answer. Any other response received a score of 0 points. This scoring procedure was adapted from Cadierno's (1995) study of the Spanish preterit tense (a past tense of perfective aspect) in which she gave partial credit for forms.

To assess the possible secondary transfer-of-training effects of instruction on the second targeted linguistic item, the French subjunctive in nominal clauses after expressions of doubt, an interpretation task and a production task were developed and used as a pre-test/post-test measure of knowledge gained at interpreting the French subjunctive of doubt. The interpretation task consisted of twenty recorded sentences. Ten of these contained the targeted linguistic forms and the other ten used the present tense of the indicative mood. The latter were distracters and were not scored. The items were recorded by a native speaker of French and played to the subjects on a CD player. The interpretation task required the learners to listen to the nominal dependent clause of each sentence and then to select the appropriate beginning for the sentence. In essence, we separated the lexical indicator of subjunctive mood "*Je doute que*" (*I doubt that)* from the subjunctive mood morphology. Learners could not rely on the lexical indicator but rather had to process the subjunctive form to link it to the lexical indicator. By dividing and restructuring the sentences in this way, we were able to move the target form into a more salient processing position. This is the secondary target item and these learners have never been exposed to it in an instructional setting. They listened to these sentences without knowing anything about subjunctive morphology.

As in the case of the interpretation task developed to measure correct interpretation of the primary linguistic target, no repetition was provided. Subjects heard each clause once and then had only 5 seconds to decide which beginning was appropriate. Again, they were given the option to indicate if they were not sure. We wanted to discourage guessing.

Scoring of the ten target items on the interpretation task consisted of a 1 versus 0 point system per item for a possible maximum score of 10 points. A subject received 1 point if the target sentence was assigned its correct beginning and received 0 points if the selection was incorrect.

The written production task consisted of ten sentences with blanks followed by the infinitive form of a verb. The participants were directed to complete the sentences with the correct form of the verb. Of these sentences 5 require the use of the indicative present tense (distracters) and 5 items require the use of the subjunctive. Five minutes were allocated to complete this task. Scoring for the production task consists of a 2, 1, 0 point system for a possible maximum score of 10 points. A participant received 2 points if the sentence completion contained a verb in the correct subjunctive form. If the verb was in the subjunctive but was the wrong person, a score of 1 point was allocated to the answer. Any other response received a score of 0 points.

To assess the possible cumulative transfer-of-training effects of instruction on the third linguistic item, the French causative with *faire*, an interpretation task and a production task were developed and used as a pre-test/post-test measure of knowledge gained at interpreting the French causative at the sentence level. The interpretation task consisted of twenty recorded sentences. Of these sentences, ten did not use the causative (distracters) and ten of the items did. These were the target items we scored. The tests were recorded by a native speaker of French and played to

the subjects on a CD player. The interpretation task required participants to listen to the twenty sentences and then indicate who was performing the action by answering the questions or by ticking *Je ne suis pas sûr(e)* "I am not sure" if they did not know. Participants had 5 seconds to answer the question and no repetition of the item was provided so that real-time comprehension could be measured. Scoring for the interpretation task consisted of a 1 versus 0 point system per item for a possible maximum score of 10 points. A participant received 1 point if the person performing the action was identified correctly and received 0 points if the person performing the action was wrong or the participant indicated an inability to determine who performed the action.

The written production task consisted of 10 written items with blanks in which participants have to complete the sentence to describe who was doing what on each of the 10 pictures shown using an overhead projector. Each sentence was begun for the learners. These beginnings contained a grammatical subject and the verb form *fait*. Of the ten pictures/sentences 5 used the French causative and 5 did not. These latter items served as distracters and were not scored. Participants had 10 seconds to complete each sentence. Scoring for the production task consisted of a 2, 1, 0 point system for a possible maximum score of 10 points. A participant received 2 points if the sentence completion contained a verb in the correct form using the causative. If the causative was used but the wrong person is indicated, a score of 1 point was allocated to the participant. Any other response received a score of 0 points.

4.5.8 Procedures

The main purpose of this study was to measure secondary and cumulative transfer-of-training effects of instruction by comparing the performance of second language learners of French who had been taught a specific linguistic item (imperfect past tense) via one of two treatments. These were a traditional focus on forms

approach (Traditional Instruction) and a psycholinguistically derived intervention focused on teaching learners to process input (Processing Instruction). We aimed at establishing whether the processing group receiving Processing Instruction would surpass the traditional group receiving Traditional Instruction on an interpretation task and a written form-completion production task on the primary target item, on which they received instruction, as well as on two other targeted items on which they did not receive instruction. The experiment was designed to make the results as objective as possible within the constraints of a University language programme. Pre-tests assessing interpretation and production for the three linguistics features were administered to all students two weeks before the beginning of the instructional period. The total number of tests administered was six. After pre-testing, the subjects were randomly assigned to one of the two treatment groups or to the control group. The instructional treatment period lasted for 1 class period, a two hour block of time. The post-tests were administered immediately after completing the instructional treatment. The fact that both interpretation and production tasks were present in all the tests is clear evidence of the fact that neither instructional group was favoured. This possible task bias factor was taken into account before the design of the experiment as it could invalidate the outcomes of the study. All the pre-tests and post-tests were balanced in terms of overall difficulty and the use of high frequency vocabulary.

Subjects were given a limited time to complete the interpretation tasks and the production tasks. The interpretation task was designed to measure real-time comprehension and so the items were not repeated. The production tasks were developed to elicit subjects' best performance. Enough time was allowed for the subjects to accomplish the tasks comfortably. The Traditional Instruction group was familiar with the format and requirements of the production tasks as a number of

instructional activities were based on them. This group was not, however, familiar with the interpretation tasks. They performed no such activity during the instructional treatment. On the other hand, the Processing Instruction group was familiar with the format and requirements of the interpretation tasks as they had carried out similar activities during the instructional treatment. The Processing Instruction group had not performed any production tasks during instruction but only as part of pre- and post-testing. Each treatment group was equally unfamiliar with half of the assessment tasks. All three groups were taught by the same instructor (the researcher) during the period of instruction. She was not, however, the participants' regular classroom instructor. In the end, the experiment included the following features:

1. use of a randomisation procedure to make groups comparable;
2. use of a pre-test/post-test procedure;
3. balance in the materials in terms of difficulty and vocabulary (verbs, adjectives) ;
4. balance across the assessment tasks in terms of difficulty and familiarity;
5. balance in the amount of explicit instruction to which learners were exposed.

4.5.9 Scoring Analysis

To address the research questions that guided this study a one-way ANOVA on the pre-test scores for the interpretation and the production tasks was conducted in order to determine whether there were any statistically significant differences between the three groups before the beginning of the experimental period. A repeated measure ANOVA was used to assess whether there were any significant effects for Instruction and Time and whether there was a significant Interaction between

Instruction and Time. Where effects were found, a post-hoc test, Tukeys test carried out to establish where statistical differences were between the three groups.

Table 4.4 provides an overview of the design and procedure used with the three groups. The results of the statistical analyses carried out in this study will be presented and analysed for each of the three linguistic targets in the next chapter.

Table 4.4 Overview of the procedure used within the three groups

	POOL OF 28 SUBJECTS RANDOMLY ASSIGNED					
	Control Group (n=6)		**Processing Instruction Group PI (n = 13)**		**Traditional Instruction Group TI (n = 9)**	
15 days before treatment	**Pre-tests (A, B, C)** A: The imperfect B:The subjunctive of doubt C: The causative		**Pre-tests (A, B, C)** A: The imperfect B:The subjunctive of doubt C: The causative		**Pre-tests (A, B, C)** A: The imperfect B:The subjunctive of doubt C: The causative	
Treatment Day	90 minutes	**No** instruction or activities on the target feature.	30 minutes	• Explicit information about the target feature: **the imperfect** • Explanations of processing strategies	30 minutes	• Explicit information about the target feature: **the imperfect** • **NO** Explanations of processing strategies
			1 hour	**Structured Input** activities	1 hour	**Mechanical** and communicative activities
	30 minutes	**Immediate post-tests (A,B,C)** A: Imperfect B:Subjunctive of doubt C: Causative	30 minutes	**Immediate post-tests (A,B,C)** A: Imperfect B:Subjunctive of doubt C: Causative	30 minutes	**Immediate post-tests (A,B,C)** A: Imperfect B:Subjunctive of doubt C: Causative

4.6 Conclusion

This concludes the discussion on the research questions of the study. The experimental design and the procedure used within the three groups under scrutiny used to investigate the transfer-of-training effect, secondary and cumulative, of

Processing Instruction were presented. Let us now focus on the results of the statistical analyses carried out in this study.

CHAPTER FIVE: RESULTS, ANALYIS AND DISCUSSION

Introduction

In this chapter the statistical analysis used in the experiment to answer the specific questions addressed in this study will be presented. The results appear in three sections. In the first section will report the results of the statistical analysis of the primary effects of Processing Instruction on the French imperfect. The second section will present the results of the statistical analysis of the secondary transfer-of-training effects of Processing Instruction on the French subjunctive morphology. And finally, in the third section we will discuss the results of the statistical analysis of the cumulative transfer-of-training effects of Processing Instruction on the French causative construction with *faire*.

Each of the three sections will be divided in two sub-sections; the first sub-section will report on the results of the statistical analysis of the interpretation task and in the second sub-section the results of the statistical analysis of the production task will be presented.

As mentioned in the previous chapter a one-way Anova was conducted on the pre-test scores for the interpretation and the production tasks in order to assess whether there were any statistically significant differences between the three groups before the beginning of the experimental period. The desired situation is that we would find no pre-existing differences. We used a repeated measure ANOVA to assess whether there were any significant effects for Instruction and Time and whether there was a significant Interaction between Instruction and Time. Where effects were found, a post-hoc test, Tukeys test was carried out to establish where there were statistical differences between the three groups. As stated above, the

results of the statistical analyses carried out in this study will be presented and analysed for each of the three linguistic targets. The chapter will conclude with a summary of the results.

5.1 Primary Effects of Processing Instruction on the French Imperfect

5.1.1 Interpretation Data

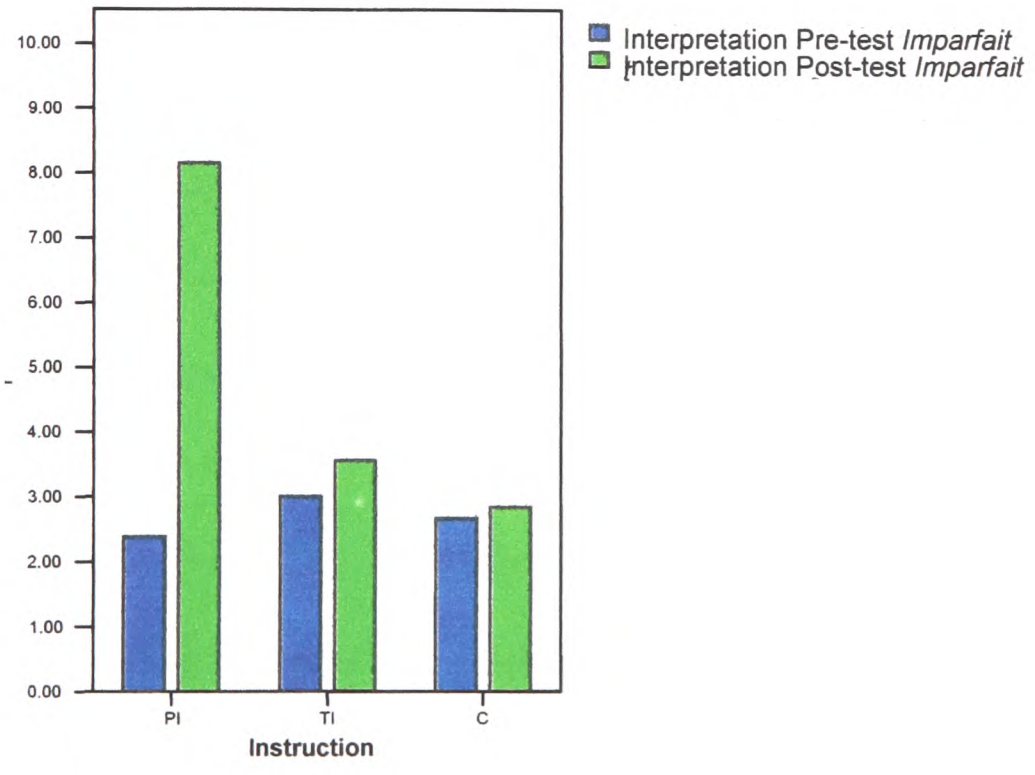
Data were collected for the interpretation task to address the first research question of the present study. The question asked was whether there would be any primary effects caused by the two instructional treatments, Processing Instruction and Traditional Instruction, in how L2 learners of French interpret sentences containing the French past tense imperfective aspects. As demonstrated and summarised in Chapter Three of this thesis, previous research has clearly and consistently demonstrated that Processing Instruction has direct and primary effects on learners. Therefore we hypothesised that Processing Instruction would be a more effective type of instruction than Traditional Instruction and the control group in helping learners to interpret correctly and efficiently sentences containing French past tense imperfective aspect. As described in Chapter 4 of this thesis, the pre-test for the interpretation task was administered to the participants two weeks before the beginning of the instructional period. All three groups received the same version of the pre-test. The raw scores were submitted to a one-way ANOVA that revealed no significant differences among the groups' mean scores, $F(2, 28) = .778$, $p = .470$. This means that any gains in the post-test scores will be attributed to the instructional treatments and not to any previous knowledge of the learners. The means in Table 5.1 are for the learners' scores on the interpretation test, both pre-test and post-test. These numbers suggest that the

Processing Instruction group improved as a result of instruction. The means are displayed in Figure 5.1.

Table 5.1 Means and standard deviations (French *imparfait*) for the Interpretation task pre-test and post- test.

		Pre-test		Post-test 1	
Variable	**N**	**Mean**	**SD**	**Mean**	**SD**
PI	13	2.38	.86972	8.15	1.46322
TI	9	3.00	1.32288	3.55	1.58990
C	6	2.66	1.36626	2.83	1.16905

Figure 5.1 Interpretation Pre-test/Post-test *Imparfait*



The mean scores were submitted to a repeated measures ANOVA for which Instruction was the between group variable and Time the repeated measure. The results of the ANOVA indicated significant main effects for Instruction, $F(2, 28) = 58.032$, $p=.000$, and Time, $F(2, 28) = 13.701$, $p=.000$, as well as a significant interaction between Instruction and Time, $F(4, 28) = 8.424$, $p=.000$.

A post-hoc Tukey test was conducted on the raw score of the post-test for the interpretation task. This is in order to show the contrast among the three groups. The post-hoc Tukey test showed that the Processing Instruction group performed significantly better than the Traditional Instruction group (p= .002); that the Processing Instruction group performed significantly better than the C group (p= .001); and that the scores of the Traditional Instruction group and the Control group were not significantly different from each other (p= .678). A significant interaction is typical of situations in which only one group improves over time and the others do not.

5.1.2 Production Data

A written production task, in the form of a written completion task (See Appendix C), was administered to the three groups to address the second research question of the present study. The question asked was whether there would be any primary effects of the two instructional treatments, Processing Instruction and Traditional Instruction, on how L2 learners of French produce sentences containing the French past tense imperfective aspects. Once again as summarised in Chapter Three, previous research has clearly and consistently demonstrated that Processing Instruction has direct and primary effects on learners production tasks, therefore we hypothesised that Processing Instruction would be an equally effective type of instruction as Traditional Instruction in helping learners to produce correctly and efficiently sentences containing French past tense imperfective aspect.

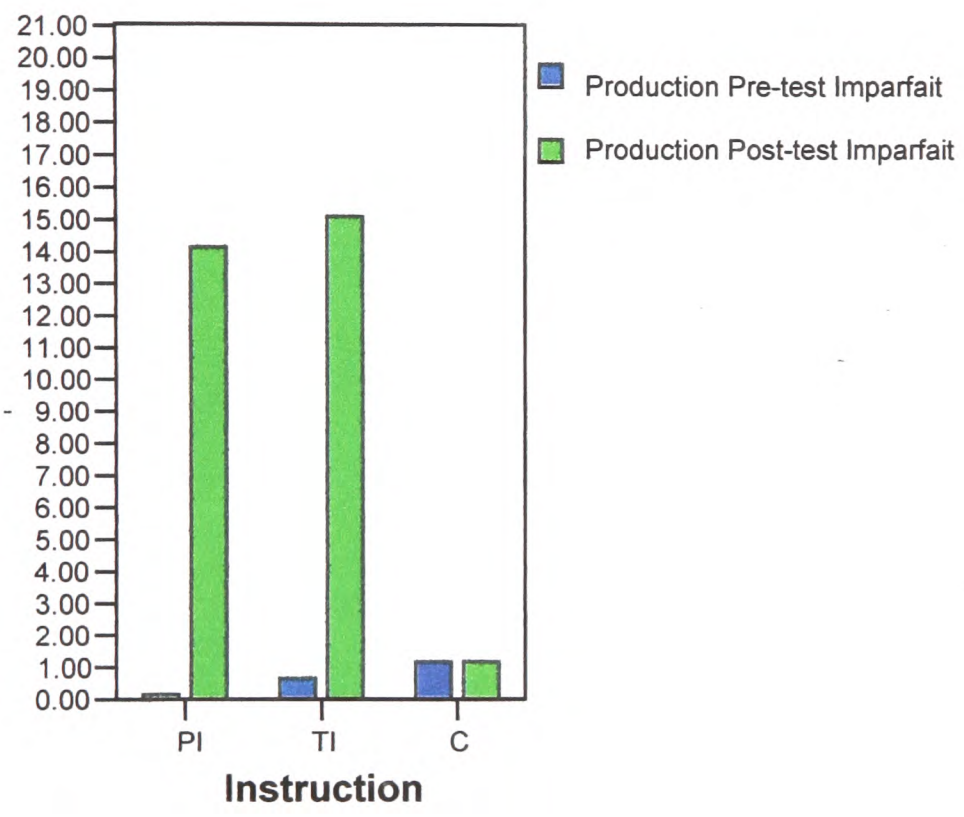
As in the case of the interpretation task, the pre-test for the production task was administered to the participants two weeks before the beginning of the instructional period and all three groups received the same version of the pre-test.

As in the case of the interpretation, data statistical analyses were performed on the raw scores of the written completion text. The means for the three groups' pre-test and post-test scores on the written production task for the primary linguistic target are given in Table 5.2 and are displayed graphically in Figure 5.2 The one-way ANOVA conducted on the written production task pre-test scores for the primary linguistic target showed no significant difference between groups prior to instruction, $F(2, 28) = 1.098$, $p = .349$). As was the case of the interpretation task, we will attribute any differences after instruction to the effects of the instructional treatments themselves. The means in Table 5.2 suggest improvement for both instructional treatments. The raw scores of the written production task were submitted to a repeated measures ANOVA to establish the possible effects of processing instruction on the way learners produce written sentences to express imperfect meaning. The results from the statistical analysis showed significant main effects for Instruction, $F(2, 28) = 21.882$, $p = .000$, and Time, $F(2, 28) = 13.642$, $p = .000$, as well as a significant interaction between Instruction and Time $F(4, 28) = 10.844$, $p=.000$. A post-hoc Tukey test was conducted on the raw score of the post-test for the production task in order to show the contrasts among the three groups. The Tukey's test on the interaction showed that both the processing group and the traditional group improved significantly from pre-test to post-test. Additionally, there was no significant difference between the scores for the two groups ($p= .814$) and both groups significantly outperformed the control group ($p= .000$). The control group, on the other hand, did not show a significant difference in pre-test and post-test scores.

Table 5.2 Means and standard deviation (French *imparfait*) for the Production task pre-test and post- test

		Pre-test		Post-test 1	
Variable	**N**	**Mean**	**SD**	**Mean**	**SD**
PI	13	.1538	.37553	14.15	3.91250
TI	9	.6667	2.0000	15.11	6.73507
C	6	1.1667	1.83485	1.1667	2.04124

Figure 5.2 Production Pre-test / Post-test *Imparfait*



A summary of the two repeated measures ANOVAs for primary effects is shown in Table 5.3. In sum, learners in the processing group improved their performance in the interpretation task from the pre-test to the post-test, and their performance was greater and statistically better than the other two groups. The Processing Instruction group learned to process the primary linguistic target, French past tense with imperfective aspect. The Traditional Instruction group, who practiced making output, did not learn to process input. These learners did, however,

successfully perform on a production test. The Traditional Instruction group learned to produce the primary linguistic target but not better than the Processing Instruction group. The Processing Instruction group also learned, as a consequence of working with input, to produce the target form. In short, both Processing Instruction and Traditional Instruction were superior to no instruction and there was no significant difference between the two instructional treatments in the written task.

Table 5.3: Summary of Repeated Measures ANOVA (French *imparfait*)

Data	**df**	**SS**	**MS**	**F**	**p**
Interpretation					
Treatment	2	100.658	50.329	58.032	.000 *
Time	2	69.577	34.789	13.701	.000 *
Time x Treatment					
Production					
Treatment	2	474.603	237.302	21.882	000 *
Time	2	378.528	189.264	13.642	.000 *
Time x Treatment					

5.2 Secondary Transfer-of-Training Effects on the French subjunctive mood morphology

Research carried out hitherto has clearly and consistently demonstrated that Processing Instruction has direct and primary effects on learners. It helps them to alter inappropriate processing strategies. However the aim of this study is, however, to discover whether the positive and primary effects of Processing Instruction could be transferred by L2 learners to other features affected by the same principle without further training. What are the possible secondary transfer-of-training effects of Processing Instruction?

5.2.1 Interpretation Data

Data were collected for the interpretation task to address the third research question of the present study. The question asked was whether there would be any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French subjunctive mood morphology as measured by an interpretation task. As stated previously, no research has been carried out to investigate the possible transfer-of training of Processing Instruction. And consequently, for the purpose of this study, we hypothesised that after Processing Instruction on French past tense imperfective aspect, learners would use a more appropriate processing strategy in a new situation. In other words we hypothesised that L2 learners would transfer that training and process subjunctive mood morphology better than those receiving Traditional Instruction as measured by an interpretation task.

As described in Chapter Four of this thesis, the pre-test for the interpretation task was administered to the participants two weeks before the beginning of the instructional period. All three groups received the same version of the pre-test.

A one-way ANOVA on the pre-test interpretation task scores of the three groups was used to insure that there were no pre-existing differences between the groups' knowledge of French subjunctive mood morphology. The results showed no significant differences among the instructional treatment groups' means before instruction ($F(2,28) = .277$, $p = .760$). Unequivocally the results of the pre-test on the interpretation task indicate that any secondary transfer-of-training effects attributed to instruction will not be attributed to prior knowledge of any of the group.

Means and standard deviations for the interpretation tests are presented in Table 5.4 and displayed graphically in Figure 5.3. These means show a modest

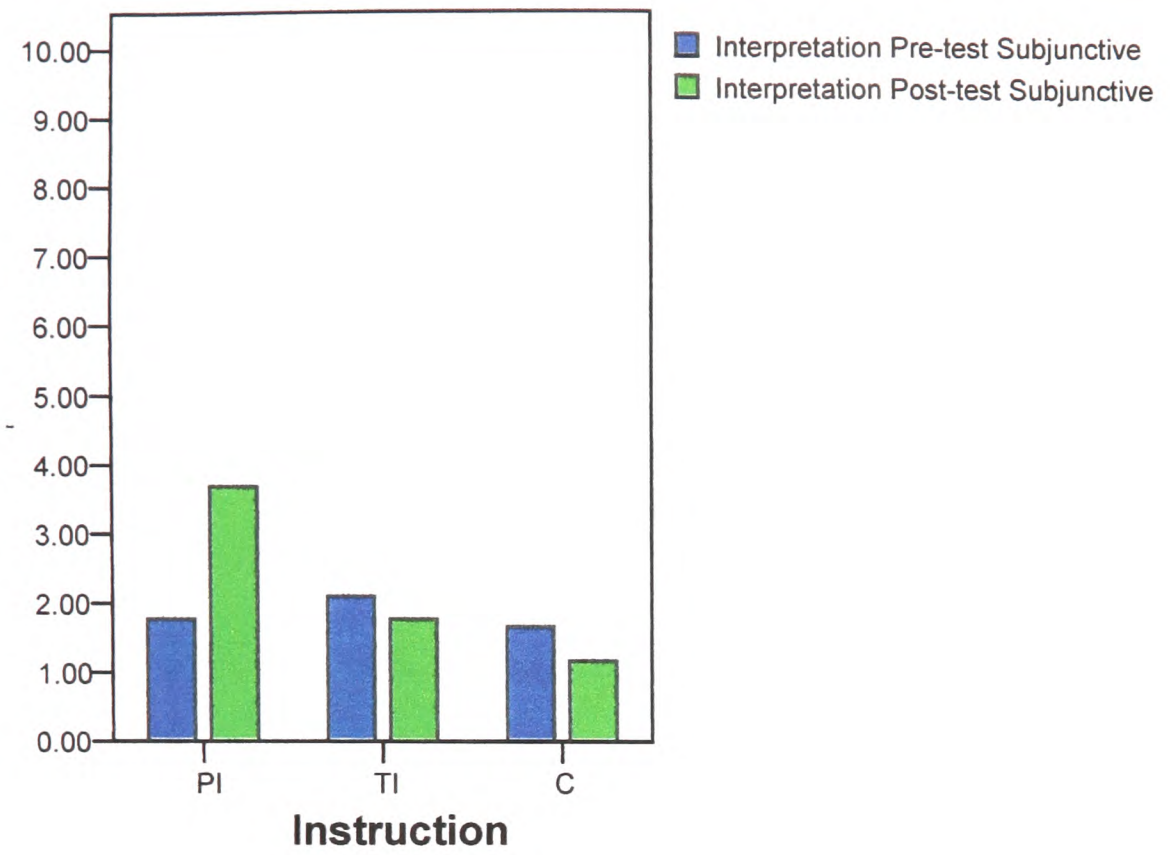
increase in score for the Processing Instruction group but a decrease in scores for the Traditional Instruction and control groups. We used an ANOVA with repeated measures to analyse the effects of Instruction and Time and the interaction between Instruction and Time. The statistical analysis revealed significant main effects for Instruction ($F(2,28) = 14.528, p = .000$) and Time $F(2,28) = 2.559, p = .047$) as well as a statistically significant interaction between Instruction and Time $F(4,28) = .582, p = .021$).

A post-hoc Tukey test was conducted on the raw score of the post-test for the interpretation task in order to show contrast among the three groups. The post-hoc analyses showed that the effect for instruction was due to the scores of the processing group being significantly higher than those of the traditional group ($p= .016$) and the control group ($p= .022$). There was no difference in scores between the Traditional Instruction and control groups ($p= .727$).

Table 5.4 Means and standard deviation (French Subjunctive) for Interpretation task pre-test and post- test.

		Pre-test		Post-test 1	
Variable	**N**	**Mean**	**SD**	**Mean**	**SD**
PI	13	1.76	1.09193	3.69	1.65250
TI	9	2.11	1.53659	1.77	1.39443
C	6	1.66	1.21106	1.16	.98319

Figure 5.3: Interpretation Pre-test/Post-test (Subjunctive)



As we can see from the means in Table 5.4, the processing group has slightly improved from pre to post-test compared to the other two groups and in particular with the control group. Although the improvement of the Processing Instruction group from the pre-test to the post-test is about 20%, it is statistically significant. What these results demonstrate is that there are secondary effects in the interpretation test for the processing group. The Processing Instruction treatment is more effective than the Traditional Instruction treatment and the control group in affecting learners' interpretation of subjunctive forms.

5.2.2 Production Data

The secondary transfer-of-training effects were further investigated by analysing the production data. A written production task, in the form of a written completion task (See Appendix C), was administered to the three groups to address the fourth research question of the present study. The question asked was whether

there would be any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French subjunctive mood morphology as measured by a production task.

As in the case of the interpretation task, considering the fact that no research, to date, has been carried out on the possible transfer-of-training effects of Processing Instruction, we hypothesised that L2 learners receiving Processing Instruction on French past tenses imperfective aspect will transfer that training and process subjunctive mood morphology better than those receiving Traditional Instruction as measured by a production task.

As with the interpretation task, the pre-test for the production task was again administered to the participants two weeks before the beginning of the instructional period and all three groups received the same version of the pre-test.

The means for the pre-test and post-test production scores are presented in Table 5.5 and displayed in Figure 5.4. The one-way ANOVA conducted on the pre-test production scores of the three groups showed no significant differences between the three groups, a not so surprising finding given that all learners scored zero on the production pretest. As in the interpretation, any secondary transfer-of-training effects attributed to instruction will not be related to prior knowledge of any of the group.

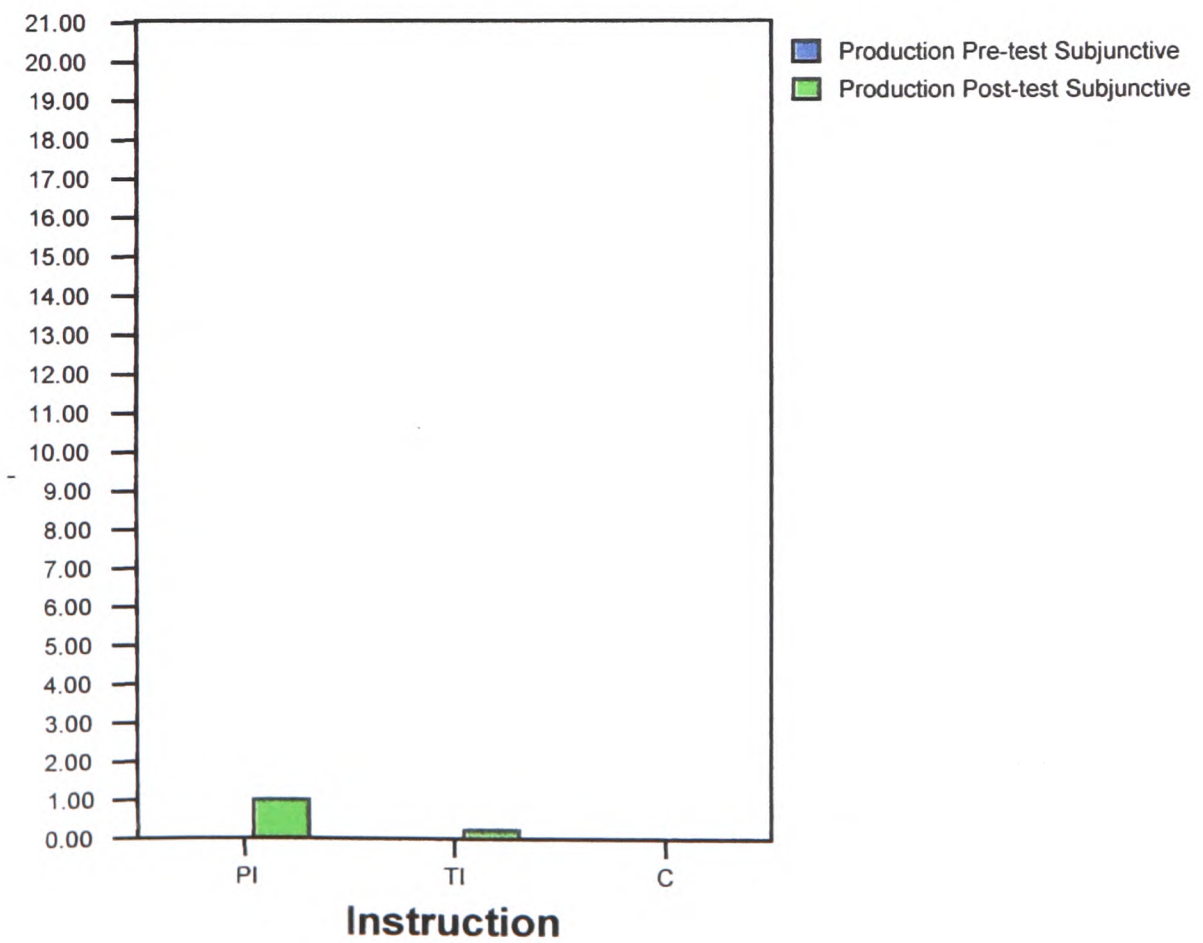
An ANOVA with repeated measures on the raw scores for the production task was then conducted to establish the possible transfer-of-training effects of Processing Instruction on the way learners produce written sentences to express the French subjunctive. The statistical analysis revealed significant main effects for Instruction ($F(2,28) = 12.170$, $p = .000$) and for Time $F(2,25) = 11.912$, $p = 002$) as well as a significant interaction between Instruction and Time $F(4,28) = 8.952$, $p = .000$).

As in the interpretation task a post-hoc Tukey test was conducted on the raw score of the post-test for the production task in order to show contrast among the three groups. The post-hoc analysis revealed the following contrasts. First, the Processing Instruction group's scores were higher than those of the control group (p= .000). Second, the Processing Instruction group's scores were also higher than the Traditional Instruction group's (p= .037). And, third, there was no significant difference in scores between the Traditional Instruction and control groups (p= .437).

Table 5.5 Means and standard deviation (French Subjunctive) for the Production task pre- test and post- test.

		Pre-test		Post-test 1	
Variable	**N**	**Mean**	**SD**	**Mean**	**SD**
PI	13	.000	.00000	1.00	.57735
TI	9	.000	.00000	.222	.44096
C	6	.000	.00000	.000	.00000

Figure 5.4: Production Pre-test/Post-test (Subjunctive)



A summary of the ANOVA repeated measures for secondary effects is shown in Table 5.6. The Processing Instruction group made a modest but significant 10% improvement from pre-testing to post-testing on producing the secondary linguistic target. The Traditional Instruction group improved only 2% but this change in performance was not statistically significant. It is the first set of findings demonstrating secondary transfer-of-training effects for Processing Instruction.

Table 5.6 Summary of Repeated Measures ANOVA (French subjunctive)

Data	**df**	**SS**	**MS**	**F**	**P**
Interpretation					
Time	2	18.842	9.421	14.528	.000 *
Treatment	2	15.863	7.931	2.559	.047 *
Time x Treatment	4	1.674	.4185	.582	.021*
Production					
Treatment	2	2.704	1.352	12.170	.000 *
Time	2	2.778	1.389	11.912	.000 *
Time x Treatment	4	2.106	.5265	8.952	.000 *

5.3 Cumulative Transfer-of-Training Effects on the French causative construction with *faire*

The other main objective of the present study was to discover whether the positive and primary effects of Processing Instruction could be transferred by L2 learners to other linguistic features affected by a completely different processing problem in order to investigate whether there were, what we called, cumulative transfer-of-training effects for Processing Instruction.

5.3.1 Interpretation Data

Data were collected for the interpretation task to address the fifth research question of the present study. The question asked was whether there would be any cumulative transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French causative constructions with *faire* as measured by an interpretation task. As in the secondary transfer-of-training effects, because no research has been carried out in this area, we hypothesised that after Processing Instruction on the French past tense imperfective aspect, learners will use a more appropriate processing strategy in a new situation. In other words, L2 learners receiving Processing Instruction on the French past tense imperfective aspect will transfer that training and process French causative constructions with *faire* better than those receiving Traditional Instruction as measured by an interpretation task.

As in the other two sets of pre-tests in the sections above, the pre-test for the interpretation task was administered to the participants two weeks before the beginning of the instructional period. All three groups received the same version of the pre-test.

The means for the interpretation pre-test and post-test results for the French causative construction with *faire* are given in Table 5.7 and graphically displayed in Figure 5.5. The means suggest that the Processing Instruction group improved their interpretation whereas the other two groups' means decreased from pre-test to post-test. We used again a one-way ANOVA on the pre-test interpretation task scores of the three groups to determine that there were no pre-existing differences between the groups. The result showed no significant differences among the instructional treatment groups' means before instruction ($F(2,28) = .337$, $p = .717$). Once again the results of

the pre-test on the interpretation task indicate that any cumulative transfer-of-training effects attributed to instruction will not be attributed to prior knowledge of any of the group.

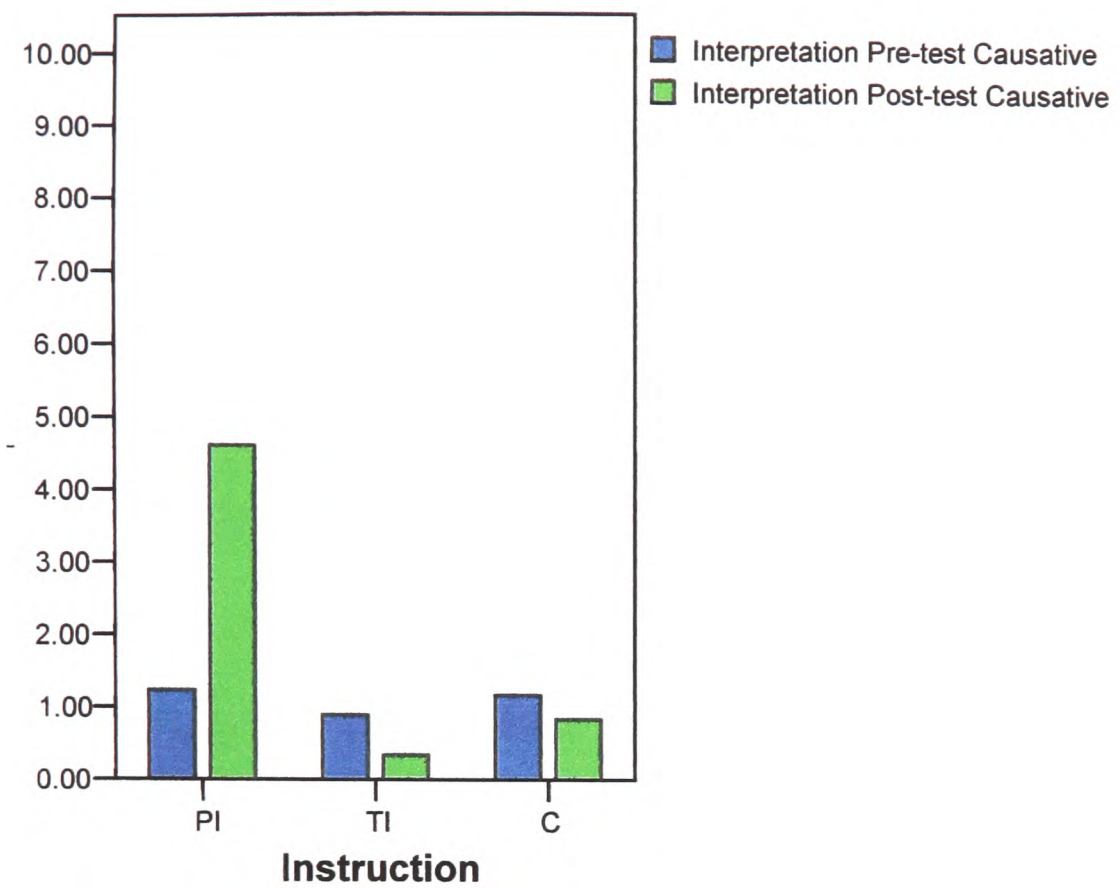
We then conducted a repeated measures ANOVA to compare the effects of Instruction and Time. The statistical analysis revealed significant main effects for Instruction ($F(2,28) = 18.312$, $p = .000$); and for Time $F(2,28) = 10.211$, $p = .001$) as well as a significant interaction between Instruction and Time $F(4,28) = 6.215$, $p = .020$).

A post-hoc Tukey test was conducted on the raw score of the post-test for the interpretation task in order to show contrast among the three groups. The post hoc analysis showed the following contrasts. The Processing Instruction group's scores are better than both the Traditional Instruction group's ($p= .001$) and the control group's ($p= .018$). There was no difference between the scores of Traditional Instruction and control groups ($p= .846$). As we can see from the means in Table 5.7, the Processing Instruction group improved by 34% from pre to post-test in interpreting correctly the underlying structure of French causative constructions.

Table 5.7 Means and standard deviation (French causative) for the Interpretation task pre-test and post- test

		Pre-test		Post-test 1	
Variable 3	**N**	**Mean**	**SD**	**Mean**	**SD**
PI	13	1.23	1.30089	4.61	2.66266
TI	9	.8889	.60093	.3333	.500433
C	6	1.16	.40825	.8333	.98379

Figure 5.5: Interpretation Pre-test/Post-test (Causative)



5.3.2 Production Data

The final analysis will now be presented in this section. The cumulative transfer-of-training effects were further investigated by analysing the production data. A written production task, in the form of a written completion task (See Appendix C), was administered to the three groups to address the sixth research question of the present study. The question asked was whether there would be any cumulative transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French causative constructions with *faire* as measured by a production task. As in the interpretation we hypothesised that cumulative transfer-of-training effects will be uncovered. In other words, we hypothesised that L2 learners receiving Processing Instruction on the French past tense imperfective aspect will transfer that training and process French causative constructions with *faire* better than those receiving Traditional Instruction as measured by a production task.

Again, the pre-test for the production task was administered to the participants two weeks before the beginning of the instructional period and all three groups received the same version of the pre-test.

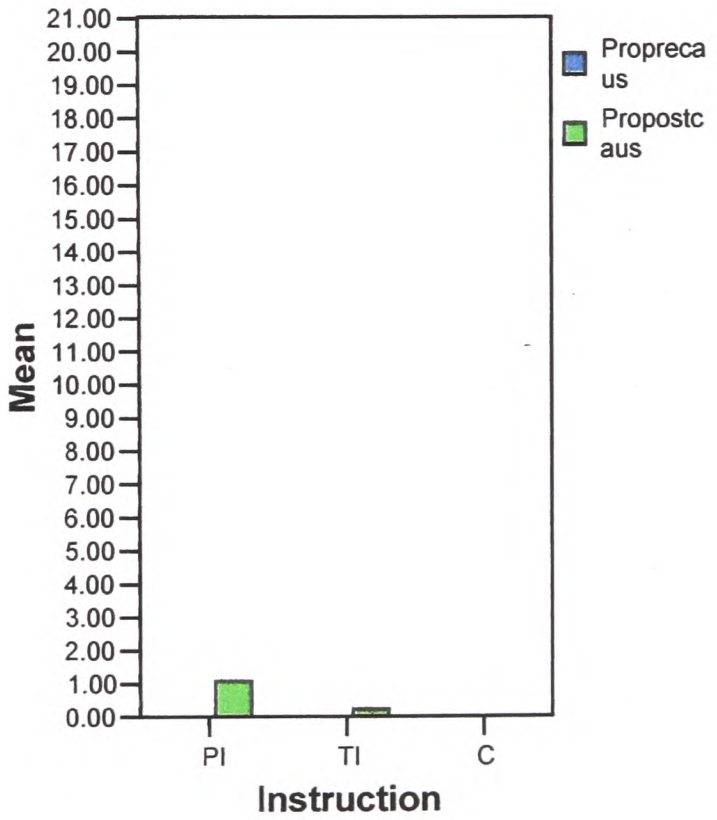
The means for the production tests on French causative constructions with *faire* are given in Table 5.8 and are displayed graphically in Figure 5.6. The one-way ANOVA conducted on the pre-test production scores of the three groups, to determine that there were no pre-existing differences between the groups, showed no preexisting differences between the groups. This finding was not surprising in that all learners scored a zero on the production pre-test. As in the interpretation task, these results indicate that any cumulative transfer-of-training effects attributed to instruction are not due to prior knowledge of any of the group.

An ANOVA with repeated measures on the raw scores for the production task was then carried out. The statistical analysis revealed significant main effects for Instruction ($F(2,28) = 17.803$, $p = 000$) and for Time $F(2,28) = 26.561$, $p = 000$) as well as a significant interaction between Instruction and Time $F(4,28) = 6.561$, $p = 000$). The post hoc analysis showed the following contrasts. The Processing Instruction group's scores were better than both the Traditional Instruction group's ($p= .013$) and the control group's ($p= .038$). There was no difference between the scores of Traditional Instruction and control groups ($p= .673$). The Processing Instruction group's 10% improvement again proved significant whereas the Traditional Instruction group's 2.7% improvement did not.

Table 5.8 Means and standard deviation (French Causative) for the Production task pre-test and post- test

		Pre-test		Post-test 1	
Variable	**N**	**Mean**	**SD**	**Mean**	**SD**
PI	13	.000	.00000	1.079	.49355
TI	9	.000	.00000	.272	.35094
C	6	.000	.00000	.000	.00000

Figure 5.6: Production Pre-test/Post-test (Causative)



A summary of the two repeated measures ANOVAs conducted to reveal cumulative transfer-of-training effects is given in Table 5.9. The present study is the first to demonstrate that Processing Instruction provides learners not only primary or direct effects of instruction on interpretation and production, but also secondary **and** cumulative transfer-of-training effects on both interpretation and production.

Table 5.9 Summary of Repeated Measures ANOVA (French Causative)

Data	df	SS	MS	F	p
Interpretation					
Treatment	2	51.737	25.869	18.312	.000 *
Time	2	65.858	32.929	10.211	.001 *
Time x Treatment	4	8.780	2.195	6.215	.020 *
Production					
Treatment	2	3.189	1.595	17.803	.000 *
Time	2	5.379	2.689	26.561	.000 *
Time x Treatment	4	2.379	.5947	6.561	.000 *

In the next section, the results will be summarised in relation to each of the research questions which motivated this study and the subsequent hypotheses formulated. The evidence collected in the present study will also be compared to previous research on Processing Instruction. Conclusions and implications will be drawn.

5.4 Summary of the Results and Discussion

The three main objectives of this study were to investigate the primary, secondary transfer-of-training, and cumulative transfer-of-training effects of Processing Instruction on the acquisition of French. The forms under scrutiny here were the primary target of the French past tense imperfective aspect and the secondary transfer-of-training target of the French subjunctive mood morphology. Both these verb final morphological marking are affected by the same processing problems.

The cumulative transfer-of-training target was the French causative construction with *faire* whose underlying subject-verb relations are misinterpreted by learners. The target language was French as learned by classroom-based native speakers of English. In order to accomplish these three objectives a series of six

questions and hypotheses were formulated in the introduction. The questions that guided our investigation are reiterated as follows.

Q1: What are the primary effects of Processing Instruction and Traditional Instruction on the acquisition of French past tense imperfective aspect as measured by an interpretation task?

Q2: What are the primary effects of Processing Instruction and Traditional Instruction on the acquisition of French past tense imperfective aspect as measured by a form production task?

Q3: Are there any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French subjunctive mood morphology as measured by an interpretation task?

Q4: Are there any secondary transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French subjunctive mood morphology as measured by a production task?

Q5: Are there any cumulative transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspect to French causative constructions with *faire* as measured by an interpretation task?

Q6: Are there any cumulative transfer-of-training effects of Processing Instruction and Traditional Instruction from receiving instruction on French past tense imperfective aspects to French causative constructions with *faire* as measured by a production task?

Based on previous empirical findings presented in Chapter Two and the review of Processing Instruction research on our target linguistic items reported in Chapter Three, a series of hypotheses were formulated in Chapter Four and are reiterated as follows:

H1: Processing Instruction will be a more effective type of instruction than Traditional Instruction and the control group in helping learners to interpret correctly and efficiently sentences containing French past tense imperfective aspect.

H2: Processing Instruction will be an equally effective type of instruction to Traditional Instruction in helping learners to produce correctly and efficiently sentences containing French past tense imperfective aspect.

H3: Learners receiving Processing Instruction on French past tense imperfective aspect will transfer that training and process subjunctive mood morphology better than those receiving Traditional Instruction as measured by an interpretation task.

H4: Learners receiving Processing Instruction on French past tense imperfective aspect will transfer that training and process subjunctive mood morphology better than those receiving Traditional Instruction as measured by a production task.

H5: Learners receiving Processing Instruction on French past tense imperfective aspects will transfer that training and process French causative constructions with *faire* better than those receiving Traditional Instruction as measured by an interpretation task.

H6: Learners receiving Processing Instruction on French past tense imperfective aspect will transfer that training and process French causative constructions with *faire* better than those receiving Traditional Instruction as measured by a production task.

In short we can say that the results of this classroom experimental study support all six questions and hypotheses. We will now summarise the results in relation to each of the research questions and the subsequent hypotheses formulated above.

5.4.1 Research Question One and Research Question Two

With regards to question one, based on previous Processing Instruction research it was hypothesised that the Processing Instruction group would perform better in the interpretation task of sentences containing French past tense imperfective aspect than the Traditional Instruction group and the Control group. The instructional data collected through the interpretation task and the subsequent statistical analysis revealed that the differences among the three groups under investigation were statistically significant. To illustrate the primary effects of Processing Instruction on the interpretation of the French imperfect, the percentage change in scores from pre-test to post-test in the interpretation task have been summarised in Table 5.10. The findings of the present classroom experimental study confirm the first hypothesis.

In question Two, once again with reference to Processing Instruction research, it was hypothesised that the Processing Instruction group would perform equally to the Traditional Instruction group in the production of sentences containing French past tense imperfective aspect. This hypothesis was supported by the written data of this study. The results of the written task revealed that both instructional treatments performed equally. To illustrate the primary effects of Processing Instruction on the production of the French imperfect, the percentage change in scores from pre-test to post-test in the interpretation task have been summarised in Table 5.10. The findings of the present classroom experimental study therefore confirm the second hypothesis.

Table 5.10 Summary of results of the primary effects of Processing Instruction on the French imperfect

		Percentage change in scores for Primary Effects
PI	Interpretation:	58%
	Production:	69%
TI	Interpretation:	5%
	Production:	71%
C	Interpretation:	2%
	Production:	0%

Processing Instruction demonstrates these effects because it fundamentally alters the way second language learners work with input. Doing so brings about changes in the processors that work with input, converting input into intake for the developing system.

5.4.2 Research Question three and Research Question Four

The second objective of the present study was to investigate whether these primary effects of Processing Instruction can be transferred or applied by L2 learners to other features affected by the same or similar processing problems. As mentioned previously, Lee (2004:319) has raised the question as to whether 'learners who receive Processing Instruction transfer that training to other forms' without any further instruction in Processing Instruction. Lee (2004) has hypothesised that learners receiving Processing Instruction on a particular form or structure affected by a processing principle might be able to transfer that training to other form or structures affected by the same or similar processing problem. In this study we took up the challenge and we measured for the first time the possible secondary effects of

instruction comparing Processing Instruction to Traditional Instruction. In measuring secondary or cumulative effects we addressed the question as to whether instruction on the French past tense with imperfective aspect will eventually aid subjunctive mood processing. Our hypothesis is based on the overwhelming evidence that demonstrates the positive and primary effects of Processing Instruction.

To illustrate the secondary transfer-of-training effects of Processing Instruction on the interpretation of the French subjunctive mood, the percentage change in scores from pre-test to post-test of the interpretation task have been summarised in Table 5.11 below.

Table 5.11 Summary of results of the Secondary Effects of Processing Instruction on the French Subjunctive mood morphology

		Percentage change in scores for Secondary Effects
PI	Interpretation:	20%
	Production:	10%
TI	Interpretation:	-5%
	Production:	2%
C	Interpretation:	-5%
	Production:	0%

The results of the interpretation task for the French subjunctive of doubt clearly indicate that the Processing Instruction group performed better than the other instructional group and the control group. Processing Instruction learners trained on verbal morphology (French past tense with imperfective aspect) gained 20% in form interpretation (French subjunctive mood). These findings suggest that the previous training on Processing Instruction received by this group might have influenced the

way L2 learners interpret sentences containing the subjunctive mood. The Processing Instruction group seems to have been able to transfer some of the training received on processing French imperfect forms to the processing of subjunctive forms. The results of the interpretation tasks prove that learners who have received Processing Instruction on the French past tense with imperfective aspect have at least developed a better intuition about subjunctive forms than learners receiving Traditional Instruction or no instruction. We can conclude that the results of the interpretation measure of assessment suggest that there are indeed secondary effects for the Processing Instruction group. The findings of the present classroom experimental study confirm the third hypothesis.

The results of the production task for the French subjunctive of doubt also showed that there are secondary effects for instructional treatments and clearly indicate that the PI group performed better than the other instructional group and the control group. The results summarised in Table 5.12 above show that the Traditional Instruction and Processing Instruction groups improved from pre-test to post-test, however it clearly shows the Processing Instruction group performed better than the Traditional Instruction group. Processing Instruction learners trained on verbal morphology (French past tense with imperfective aspect) gained 10% in form production (French subjunctive mood). These findings suggest that the previous training on Processing Instruction received by this group might have influenced the way L2 learners not only interpret but also produce sentences containing the subjunctive mood. The findings of the present classroom experimental study confirm the fourth hypothesis.

The results of this study indicate that Processing Instruction is a successful intervention at enriching learners' intake and shaping their developing system and suggest that Processing Instruction practice has indeed secondary effects as

processing the French past tense with imperfective aspect aids the processing of subjunctive forms. Based on these results in which we found secondary transfer-of-training effects with regard to French verb morphology, we can hypothesise that learners' internal systems had restructured (or at least had begun to restructure) such that their systems now included a verb final slot. An important Processing Instruction finding is that the learners' language production mechanisms have access to this new information about the verb final slot. In contrast, Traditional Instruction practice only makes the form available for production and Traditional Instruction cannot make a form available to processing mechanisms. Extrapolating from our cumulative transfer-of-training findings we assert that Processing Instruction learners are more efficient language learners.

We now have a first set of findings demonstrating secondary transfer-of-training effects for Processing Instruction in support of Lee's (2004) hypothesis regarding transfer-of-training. The results of this study demonstrate positive secondary transfer-of-training effects and lead us to hypothesise that multiple Processing Instruction treatments on different linguistic targets all pose the same processing problem to learners which will have a profound effect on learners' underlying systems. In other words, the L2-driven processing strategy learned will eventually become the learners' default strategy for working with primary linguistic data. For example, if learners received Processing Instruction on French past tense imperfective aspect, followed by Processing Instruction on subjunctive mood morphology, followed by Processing Instruction on future tense morphology, then they would adopt the L2 appropriate (word-final) processing strategy to process imperative or conditional forms. We would not see just a secondary effect of 10%-20% as we did in the present study but an even greater effect.

5.4.3 Research Question Five and Research Question Six

The third objective of the present study was to investigate whether the positive and primary effects of Processing Instruction can be transferred by L2 learners to other features affected by a completely different processing problem. In this study we measured for the first time the possible cumulative transfer-of training effects comparing Processing Instruction to Traditional Instruction. In measuring cumulative effects we addressed the question as to whether instruction on the French past tense with imperfective aspect will eventually aid causative construction processing. To illustrate the cumulative transfer-of-training effects of Processing Instruction on the interpretation of the French causative with *faire*, the percentage change in scores from pre-test to post-test of the interpretation task have been summarised in Table 5.12.

Table 5.12 Summary of results of the Cumulative Effects of Processing Instruction on the French causative with *faire* construction

		Percentage change in scores for Cumulative Effects
PI	Interpretation:	34%
	Production:	11%
TI	Interpretation:	-5%
	Production:	3%
C	Interpretation:	-5%
	Production:	0%

The results of the interpretation task for the French causative clearly indicate that there are cumulative transfer-of-training effects for instructional treatments and shows that the Processing Instruction group performed better than the other instructional group and the control group. Processing Instruction learners trained on

verbal morphology (French past tense with imperfective aspect) gained 34% in form interpretation on a syntactic construction (French causative with *faire*). The findings of the present classroom experimental study confirm the fifth hypothesis.

The results of the production task for the French causative with *faire* also showed that there are cumulative transfer-of-training effects for instructional treatments and clearly indicate that the Processing Instruction group performed better than the other instructional group and the control group. The results summarised in Table 5.12 above show that Processing Instruction learners trained on verbal morphology (French past tense with imperfective aspect) gained 11% in form production (French causative with *faire*). The findings of the present classroom experimental study confirm the sixth hypothesis.

The most important finding of the present study, arguably, is that Processing Instruction offers learners cumulative transfer-of-training effects. If we consider the findings described above we can hypothesise that Processing Instruction learners develop better intuitions about working with L2 input. Given these findings the Intuition Hypothesis, developed in part from Lee's (2004: 320) appears to be a valid hypothesis: "Learners who receive PI will develop better intuitions about the L2 than will learners who receive other types of instruction."

In other words, from the findings in this study we can conclude that learners who receive Processing Instruction on one form will, as a result, extrapolate from that training and develop L2-appropriate intuitions for working with L2 input.

5.5 Conclusions

To conclude, the findings of this investigation allow us to put forward a series of conclusions regarding the primary and secondary effects of Processing Instruction.

With regard to the primary effects, we can conclude that Processing Instruction is a more effective instructional treatment than Traditional Instruction in helping L2 learners at interpreting sentences containing the French imperfect form. Processing Instruction is equally successful as Traditional Instruction in helping learners produce sentences containing French imperfect forms. We can therefore conclude that Processing Instruction is successful in altering processing problems that affect the French imperfect forms (Lexical Preference Principle and Sentence Location principle).

With regard to the secondary effects of Processing Instruction, we can conclude that L2 learners in the processing group were not only able to transfer the Processing Instruction training received for the French imperfect to another linguistic form in French (subjunctive) affected by similar processing problems, but they were able to transfer the Processing Instruction training received for the French imperfect to another linguistic form in French (causative) affected by different processing problems. The next chapter will discuss the overall findings and whilst some conclusions will be drawn, implications, limitations and avenues for further investigation will also be put forward.

CHAPTER SIX: CONCLUSIONS AND REFLECTIONS

6.1 Discussion of the findings

In this thesis we demonstrated that Processing Instruction is a powerful tool to resolve the conundrum of Second Language Acquisition. It is the recognition of the crucial role of input in Second Language Acquisition which has drastically changed research in the field and lead to new areas of research and development of new models like VanPatten's model of Input Processing.

The Processing Principles associated with the Input Processing theory were presented in Chapter One as well as some of the empirical work from which the principles were developed. We also provided other empirical work that supports the principles. In Table 6.1, a summary of the Processing Principles that framed our investigation is provided. Once the Input Processing model determined how L2 learners work with the input, an instructional technique, called Processing Instruction, has been derived and instructional material written in a way that intervene at the time L2 learners are working with input to make form-meaning connections and not at the time when they are practicing making output. In other words, this model of Input Processing is the foundation on which Processing Instruction has been built.

Processing Instruction was described in Chapter Two and defined as a psycholinguistic focus on form type of grammar instruction developed by VanPatten. Processing Instruction is predicated on the model of Input Processing, as a form of instruction to resolve the processing "problems" described in the Input Processing model. With the processing principles in mind, Processing Instruction uses Structured Input Activities to help L2 learners to adopt a processing strategy that will allow them to interpret a sentence accurately.

Since VanPatten and Cadierno's (1993) initial research work there have been a large number of studies, all addressing specific problems and exploring different areas, that have further evaluated the effectiveness of Processing Instruction. In Chapter Three we presented a review of the different lines of research which investigated the primary effect of Processing Instruction and the results of the empirical research have consistently shown that Processing Instruction is a better and more effective approach to grammar instruction.

The empirical investigation presented in Chapter Four was conducted in order to move research in Processing Instruction into a new area of investigation. We presented research on the acquisition of French verb morphology and syntax by native speakers of English learning French. This study investigated the primary and transfer-of-training, both secondary and cumulative, of Processing Instruction on the acquisition of French We examined two verbal morphemes and one syntactic construction. As can be seen in Table 6.1, these three linguistic targets present learners very different processing problems. The verb form on which learners received instruction was the past tense imperfective aspect marker. As seen in Chapter One, tense morphemes can be made redundant by a lexical item (the Lexical Preference Principle) therefore processing instruction on this verb form consisted of isolating the form by removing all other indicators of time. Learners were forced to use the verb form to assign tense. The other targeted verb form was subjunctive mood morphology which presents learners with several processing problems. These verbal markers occur in subordinate (dependent) clauses and the form is triggered by the semantics of the verb phrase in the principal (independent) clause. In the case of the subjunctive mood morphology the form is triggered by the meaning expressed in the

main clause therefore we can say that the subjunctive form is nonmeaningful; *comprends* and *comprenne* both mean the same thing. The morphological distinction between indicative and subjunctive is purely grammatical. The processing problem here is captured in the Meaning-Before-Nonmeaning Principle. Additionally, subjunctive verb morphology does not occur in a favoured processing position. VanPatten captured this problem as the Sentence Location Principle: " 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 2004b:13-14). The other targeted linguistic item was causative construction with the verb *faire*. The surface level syntax and morphology do not transparently reflect the underlying relations between agents and actions. As discussed in Chapter One, this construction is an example of how learners use content words to make meaning (P 1a. The Primacy of Content Words Principle: "learners process content words in the input before anything else." VanPatten, (2004b:8). For these constructions, learners tend not to process the verb *fait* nor the marker *à*. Additionally, these constructions are subject to the P 2. The First Noun Principle: "learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent." (VanPatten 2004b: 15). For these constructions, learners take the first noun and make it the object of the first verb they process (after skipping over *fait*). The result is that they completely misinterpret the underlying relations between agents and actions.

These processing principles and the processing problems associated with these principles are important to acquisition because if learners are not processing a form they cannot acquire it. In other words, if learners are not connecting a form with its meaning, then they are not acquiring it.

Table 6.1 Summary of the Processing Principles Investigated

Targeted linguistic item	Processing Principle(s)	Transfer-of-training linguistic item	Processing Principle(s)
French past tense, imperfective aspect	**P 1b. 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.	**French subjunctive mood**	**P 1b. 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. **P 1d. The Meaning-Before-Nonmeaning Principle:** learners are more likely to process meaningful grammatical forms before nonmeaningful forms irrespective of redundancy. **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.
French past tense, imperfective aspect	**P 1b. 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.	**French causative constructions with *faire***	**P 2. The First Noun Principle.** Learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent. P 1a. The Primacy of Content Words Principle: learners process content words in the input before anything else.

As previously stated the present study explored uncharted territory with respect to what we know about the secondary effects of Processing Instruction on second language acquisition. The results presented in Chapter Five show that Processing Instruction not only provides learners the direct or primary benefit of

learning to process and produce a morphological form on which they received instruction, but also a secondary benefit in that they transferred that training to processing and producing another morphological form on which they had received no instruction. Additionally, it showed a cumulative benefit of Processing Instruction in that learners transferred their training processing morphology to processing and producing a syntactic construction. Let us now give a summary of the results in relation to the six hypotheses made in this thesis.

6.2 Summary of the Interpretation of the Results

The three main objectives of this study were to investigate the primary, secondary transfer-of-training, and cumulative transfer-of-training effects of Processing Instruction on the acquisition of French. The point of departure in carrying out this work was a set of three hypotheses generated by Lee in his critical review of the Processing Instruction research (Lee, 2004).

However, in order to accomplish these objectives a series of six questions and hypotheses were formulated (See Chapter Five). The results of the classroom experimental study support all six questions and were summarised in Chapter Five in relation to each of the research questions which motivated this study.

In order to interpret the results further, a summary of our findings on the primary and transfer-of-training effects of Processing Instruction and Traditional Instruction is presented in Table 6.2. In short, from this summary we can say that these results lend support to all six hypotheses.

Table 6.2 Summary of the Primary and Transfer-of-Training Effects of Processing Instruction versus Traditional Instruction versus Control

Linguistic Item: targeted	**Results: Primary Effects**	**Linguistic Items: transfer-of training**	**Results: Transfer Effects**	**Subjects**
French past tense, imperfective aspect	Processing: Primary effect: yes PI > TI > C Production: Primary effect: yes (PI = TI) > C	**French subjunctive mood**	Processing: Transfer effect: yes PI > (TI=C) Production: Transfer effect: yes PI > (TI=C)	L1: English Age: university-level adults
French past tense, imperfective aspect	Processing: Primary effect: yes PI > TI > C Production: Primary effect: yes (PI = TI) > C	**French causative constructions with *faire***	Processing: Transfer effect: yes PI > (TI=C) Production: Transfer effect: yes PI > (TI= C)	L1: English Age: university-level adults

The findings on the primary effects of Processing Instruction on the acquisition of the French imperfect by native speakers of English are in support of Hypotheses 1 and 2. As described in Chapter Five, the instructional data collected through the interpretation task and the subsequent statistical analysis revealed that the Processing Instruction group performed better that the Traditional Instruction group and the control group (See Table 5.10 and Table 6.2). The results of the written task also revealed that both instructional treatments Processing Instruction and Traditional Instruction, performed equally (See Table 5.10 and Table 6.2) and that they performed better than the control group. Therefore, the results of the study confirm and support Hypotheses 1 and 2. And as stated in Chapter Five, Processing Instruction

demonstrates these effects because it fundamentally alters the way L2 learners work with input. Doing so brings about changes in the processors that work with input and that convert the input into intake for the developing system.

Our findings on the secondary transfer-of-training effects of Processing Instruction are in support of Hypotheses 3 and 4. We isolated for examination two French verbal morphemes affected by the Lexical Preference Principle: the French imperfect and the French subjunctive of doubt. The temporal information encoded in the French past tense with imperfective aspect can also be expressed lexically through adverbs and adverbial phrases. For the tense marker, a lexical item could encode time but such a lexical item is not an obligatory part of the sentence. The verbal markers of the subjunctive mood morphology occur in subordinate (dependent) clauses and the form is triggered by the semantics of the verb phrase in the principal (independent) clause. The subjunctive form is triggered by the meaning expressed in main clause and is therefore a nonmeaningful form. For the mood marker, the semantics of the entire main clause determine the use or not of the mood marker. The presence of the main clause and its meaning are obligatory.

In the Processing Instruction treatment we taught learners to attend to the verb final morpheme *-ais/-ait* of the French imperfect and to use this form to make meaning. Meaning here refers to the concept of pastness. As the results of the analysis of primary effects show, learners successfully adopted this processing strategy for the target form. As the results of our analysis of the secondary transfer-of-training effects show, the L2 learners successfully applied this processing strategy to another formal feature of French (the subjunctive of doubt) without further instruction on this form (See Table 5.11 and Table 6.2). Therefore, these results provide support for Hypotheses 3 and 4 of this thesis and for Lee's Hypothesis 9

(2004:322): "Learners who receive training on one type of processing strategy for one specific form will appropriately transfer the use of that strategy to other forms without further instruction in PI".

These findings also provide support for Hypotheses 3 and 4 and for Lee's Hypothesis 10 (2004:322): "Learners who receive PI will develop better intuitions about the L2 than learners who receive other types of instruction".

As described above, two verbal morphemes affected by the Lexical Preference Principle, but affected in different ways were selected for examination. For the tense marker, a lexical item could encode time but such a lexical item is not an obligatory part of the sentence. For the mood marker, the semantics of the entire main clause determine the use or not of the mood marker. The presence of the main clause and its meaning are obligatory. These two verbal morphemes are very different from each other in that one is meaningful and the other is not. One occurs in the main clause and the other in a dependent clause. Despite these differences the learners who received Processing Instruction training on the tense marker were then better able to process the mood marker. How would L2 learners transfer Processing Instruction on a meaningful tense marker occurring in a main clause to a nonmeaningful mood marker occurring in a dependent clause except by having developed a better intuition about the target language? Processing Instruction forced L2 learners to use the verbal morphology which is something they would not have done left on their own. Processing Instruction has helped alter the way they approach the target language and did so in a way that is useable to L2 learners beyond the directly affected target item. These learners are developing different intuitions about the way French works.

As this study is the first one investigating the transfer-of training effect of Processing Instruction and the intuition hypothesis, the results indicate several new

lines of research for Processing Instruction and we would expect that future research will lend even greater support to the hypotheses.

The findings on the cumulative transfer-of-training effects for Processing Instruction are in support of Hypotheses 5 and 6 of this thesis and Lee's Hypothesis 11 (2004:322): "The cumulative effects of PI will be greater than its isolated effects".

The verbal morphology of the French imperfect and the French causative with *faire*, a complex syntactic construction with two underlying agents, were isolated for examination. These two aspects of French do not present to learners the same or even similar processing problems. The verb morphology is affected by the Lexical Preference Principle whereas the syntactic construction is affected by the First Noun Principle and the Primacy of Content Words Principle. The cumulative effect is that this instruction carried over to a completely new form (see Table 5.12 and Table 6.2). The Processing Instruction learners have begun to work with French syntax differently than those who did not receive Processing Instruction.

In Table 6.3 the increase in performance, as a percentage, of the Processing Instruction group is presented. The increase for the primary linguistic target as well as for the secondary and cumulative target items is given in order to provide some perspective on the results presented in Chapter Five.

Table 6.3 Summary of the Increase in Performance of Processing Instruction Group

Primary target	Primary Effects	Secondary Targets	Secondary Transfer-of-Training Effects	Cumulative Transfer-of-Training Effects
French past tense, imperfective aspect	Interpretation 58% Production 69%	**French subjunctive mood**	Interpretation 20% Production 10%	
		French causative constructions with *faire*		Interpretation 34% Production 11%

When learners receive Processing Instruction the direct effects on their interpretation and production of the form are fairly equal: 58% and 69% for French past tense. Both interpretation and production scores are increasing. The greatest area in which Processing Instruction affects transfer-of-training is found in the interpretation task scores. These are consistently higher than the production scores. Even in the lowest scores the results of the Transfer-of-Training effects of Processing Instruction in the interpretation task have doubled and at the highest they have tripled. For secondary and cumulative effects, the impact of Processing Instruction on language learners is greatest in the area of interpretation.

Another perspective to take on the transfer-of-training findings is to compare these results with those of previous research in which our transfer-of-training targets were the primary targets. This perspective is presented in table 6.4 in which the results of two previous studies with those presented in the present thesis are compared. Lee and Benati (2007b) investigated the direct effects of Processing Instruction on French subjunctive mood morphology. VanPatten and Wong (2004) examined the direct effects of Processing Instruction on French causative constructions with *faire*.

Table 6.4 The increase in performance from when the secondary targets of this study were primary targets

Target item	Primary Effects	Transfer-of-Training Effects
French causative construction with *faire*	VanPatten and Wong (2004) Interpretation 69-71% Production 61-79%	 Interpretation 34% Production 11%
French subjunctive mood morphology	Lee and Benati (2007b) Interpretation 67% Production 58%	 Interpretation 20% Production 10%

From the figures presented in Table 6.4 we can see that the impact of Processing Instruction is greater for direct effects than it is for transfer-of-training effects. With direct training on French causative constructions, learners improve on their interpretation scores by 69%-71% whereas as a secondary effect they improve on these scores by 34%. This means that learners are almost half way to where they would be had they received direct instruction on the form.

The results are not so dramatic for French subjunctive mood morphology. With direct instruction learners' interpretation scores improved by 67% whereas as a secondary effect the improvement was 20%. They are less than one third of the way to where they would be with direct instruction. And, as stated previously, the results with regard to production are very different. Whether the size in percentage increase is low or high, these statistically significant results point to the fact that Processing Instruction has both primary and transfer-of-training effects and that the instruction has helped bring about changes in the learners' internal systems.

6.3.1 Implications of the study in the Context of Processing Instruction Research

As described in our review in Chapter Three the point of departure of research in Processing Instruction was to prove that Processing Instruction was an effective instruction *vis a vis* other types of instruction (VanPatten and Cadierno 1993). VanPatten and Cadierno's original study generated the first line of research under which subsequent research has been classified. The results show that Processing Instruction is an effective form of instruction. The second line of research was established in 1996 when VanPatten and Oikennon investigated which component of Processing Instruction is the causative factor in the positive findings. This second line of research has extended to identifying some of the variables constituting

Processing Instruction, and testing whether the beneficial effects of Processing Instruction should be attributed to the Structured Input component or the Explicit Information component (which included information about processing strategies). Although established in 1996, subsequent research on the roles of Structured Input and Explicit Information did not appear until VanPatten's 2004 edition. In Chapter Three, the results indicate that Structured Input Activities alone have the same effect on learners as does the combination of Explicit Information plus Structured Input Activities. Recently, two new lines of Processing Instruction research have opened up into research on enhancing Structured Input and on the modes of delivering Processing Instruction. Lee and Benati (2007a) investigated the relationship between Structured Input and enhanced input (Wong 2005). In a series of investigations, they compared the effects of Structured Input to those of textually or acoustically enhanced Structured Input. For the four target items they investigated they found that enhanced and unenhanced Structured Input Activities had equal effects on learners' performance. Lee and Benati (2007b) investigated the effects of delivering Processing Instruction in a classroom, whole-group context and in a virtual context, (learners working individually at computer terminals). In a series of investigations, they found that both classroom and computer delivery of Processing Instruction were equally effective. With the study presented in this thesis, we have opened a new line of research for Processing Instruction and that is research on the transfer-of-training effects of Processing Instruction. In short, the Processing Instruction on one linguistic item leads to transfer-of-training effects on other linguistic items. This is a completely new line of research and such new areas of investigation will require time to become more fully established so that a robust set of findings is available to those interested in Input Processing Theory as well as in Processing Instruction.

6.4 Limitations of the Studies and Avenues for Further Research

As mentioned previously, our research has been motivated by three of Lee's (2004) 11 hypotheses about the effects of Processing Instruction. In this final section, we would like to further discuss our results, the limitations of the study and Lee's hypotheses in order to propose new avenues for further research.

As with all empirical research, the present study is limited in several ways. While we recognise the positive outcomes in this study, we also acknowledge certain limitations and avenues for further investigation.

The first limitation of the present study concerns the relatively small number of subjects who participated in the experiment (28 participants). The size of the final data pool could have included multiple groups of learners in each instructional treatment and we could have increased the size of the control group. Further research could address this problem and replicate our experiment with a larger sample size.

Another limitation is that this study did not include delayed post-testing. The experiment should also be repeated using a delayed post-test to measure for the long-term effects. The issue of the long-term effects of Processing Instruction is an important and difficult one that has been clarified by research and we do know, as described in Chapter Three, that the primary effects of Processing Instruction are undiminished for one week (e.g., Cadierno 1995; Lee, Benati, Aguilar-Sánchez and McNulty 2007), two weeks (e.g., Farely 2004a), three weeks (e.g., Benati 2001; Cheng 2002) and one month later (e.g., Benati 2004a, VanPatten and Cadierno 1993). VanPatten and Fernández (2004) measured the longer term effects. After eight months they found that the effects of Processing Instruction had endured but had diminished. However, measuring the long-term effects of Processing Instruction is

associated with the substantial challenge of controlling the input to which learners are exposed so that it does not include the target item. In the context of this research measuring the long-term effects of transfer-of-training effects of Processing Instruction is adding another substantial challenge that is to control the input to which learners are exposed so that it does not include not only the target items but also the secondary items. We were unable to include delayed post-testing in the present study, but future research could address this important issue and investigate whether the secondary and cumulative transfer-of-training effects of Processing Instruction will also hold over time.

Thirdly, we also need to acknowledge that in this study, like in all studies on Processing Instruction, the issue of individual differences must be addressed. As described in Chapter Three, in all the research on Processing Instruction only two studies have addressed individual differences among the learners. Lee, Benati, Aguilar-Sánchez and McNulty (2007) found differences among the learners in how much they improved from pre-test to post-test. The learners with the lower pre-test scores gained more than the learners with the higher pre-test scores so that both groups ended up near the same spot. VanPatten and Wong (2004) suspected there might be individual differences based on the different universities in which their subjects were enrolled. This difference did not come about. They did find, however, that some learners employed a test-taking strategy that boosted their performance. They separated these learners out of their data pool. The nature of individual differences is a vast field of investigation and further research is needed in order to investigate whether some learners would benefit more from the transfer-of-training effects of Processing Instruction than others.

The findings of our study encourage the development of a new line of research which should focus on the ongoing effects of Processing Instruction. As discussed in Chapter Five we propose the idea that processing strategies strengthen with repeated treatments (cf. 5.4.2). But further research is needed to investigate whether L2 language learners who receive multiple Processing Instruction treatments that address the same processing principle, will increasingly strengthen their use of the more optimal processing strategy until it becomes their default strategy for processing second language input. It would be fascinating to find out at what point the processing strategy become the learner's default strategy.

Our results are based on one language, French, and one primary target item. Our instructional treatments essentially taught the learners how to direct their attention to the ends of words. They successfully used this strategy on other forms, the secondary targets. However learners would probably need more training on the first feature in order for it to have a successful impact on the secondary features in terms of helping learners to produce these features. Further research should address this question and measuring secondary effects perhaps after a longer period of instruction. This new line of research on the secondary transfer-of-training effects of Processing Instruction is very new but quite worthy of further investigation.

We also established that Processing Instruction has a cumulative effect. From learning to process verb morphology learners began to attenuate their use of the First Noun Principle. Our evidence for cumulative effects resides in just one piece of research. More work in the area and more studies on the same and different linguistic features in French but also in different languages are needed in order to strengthen our results. Further research is already moving towards this direction and will appear in Benati and Lee (2008). Lee (2004) hypothesized that the cumulative effects of

Processing Instruction would be greater than its isolated effects and they are. Our findings show that L2 learners who receive training on one type of processing strategy begin to work with primary linguistic data differently.

As mentioned in previous discussion, we believe that the reason underlying the change in how L2 learners work with primary linguistic data is that Processing Instruction helps develop other intuitions about how the language works. Processing Instruction brings about changes in the internal processing mechanisms which then operate on the next input to which the learners are exposed. Our results support Lee's hypothesis and show that L2 learners who received Processing Instruction developed better intuitions about how the French language works than learners who receive Traditional Instruction.

6.5 Final Conclusion

For the last fifteen years, research has proven that Processing Instruction is an effective type of instructional intervention. The results showed that learners' performance improves when measured with interpretation tasks, sentence-level production tasks and discourse-level production task. Research has also demonstrated that Processing Instruction is an effective intervention for different target languages such as English, Japanese, French and other Romance languages. And it has also been demonstrated that L2 learners with different L1s (Italian, English, Chinese, Greek) benefit from Processing Instruction. Based on the findings of our study we can conclude that Processing Instruction shows secondary and cumulative transfer-of-training effects.

The study contributes significantly to the field of Processing Instruction. It has illustrated that L2 learners benefit from Processing Instruction directly, that is, they

improve on the targeted linguistic item, but also indirectly, in that they improve on other linguistic items.

These results give us another reason to assert that Processing Instruction is an effective type of instructional intervention and this reason is perhaps the most persuasive. This study shows that there are a number of new avenues which could and should be explored by researchers in the interest of L2 learners, that is facilitating the acquisition of a L2 language.

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APPENDIX A Information/Consent form

INFORMED CONSENT

You are being asked to participate in an experiment in language instruction. You will take some tests involving interpreting sentences in French as well as completing some sentences in French. You will also, with your classmates, receive instruction on a particular structure in French. Your answers will remain confidential and there will be no references to your name in any documents associated with the answers and analysis. All results will be reported as group means so no individual results will be made available.

You will benefit from this instruction by receiving instruction and practice on a structure in French you might not encounter until later. Your participation is voluntary and you may choose to leave at anytime and not complete the experiment. If you agree to participate please indicate by signing below.

I agree to participate in this experiment. My participation is voluntary and I have read the above informed consent information.

Name _____ Date _____

Please indicate here your native language(s): _____ **Signature** _____

If you have any questions you may contact the researcher, Cécile Laval at C.laval@greenwich.ac.uk or the Head of Department, Dr Alessandro Benati at ba07@greenwich.ac.uk

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APPENDIX B Instructional packets[2] for PI treatment and for TI treatment.

These instructional packets were constructed and created by the researcher to be used for Processing Instruction treatment (Appendix B1) and for Traditional Instruction treatment (Appendix B2) on the acquisition of the French imperfective aspects.

[2] Pictures used to create the two instructional packets were taken from Clip Art.

APPENDIX B1

Instructional Packet PI

The French "*Imparfait*"

This is your pack of material for this lesson. Write your name below so that your instructor can give it back to you after she collects them.

Your name:

_____

Please indicate below what your native language (s) is (are):

_____

_____

Instructional Packet PI

The French Imparfait

We often use sentences in the past tense to describe a past event or an on-going action in the past.

E.g. ***This morning I was speaking to my mother on the phone.***

In this sentence we are using the imperfect.

In French, the imperfect, is called ***l'imparfait.*** This past tense has different forms from the present tense.

E.g. Ce matin, je parl**ais** à ma mère au téléphone.

NOTICE that:

Past form is usually accompanied by temporal adverbs that will indicate that the action has already happened in the past. Here are some of the most common ones: hier (*yesterday*), la semaine dernière (*last week*), avant-hier (*the day before yesterday*), hier soir (*last night*), l'été dernier (*last summer*) etc. However, although these adverbs are a good clue that an action has occurred in the past, they are not always present in the sentences. That is why it is very important for you to recognise past tense verb forms. Fortunately, the imperfect verb form is stressed, making it a bit easier to hear.

USE:

The imperfect tense (**l'imparfait**) has two primary uses:

3. To describe on-going actions and states of being in the past: The *imparfait* is used to describe people, places, conditions or situations in the past.
4. To state habitual actions or states in the past.

1. FORMATION

Third person singular:

Let's look only at the third person singular (il/elle/on) of the French past tense the *imparfait*.

The ***imparfait*** is formed by dropping the **-ons** ending from the present "**nous**" form of the verb and adding the imparfait ending for the third person singular (il/elle/on): **-ait.**

	Présent	Imparfait stem	Imparfait (Il/Elle/On)
Parler	Nous **parlons**	**Parl-**	Il **parlait**
Finir	Nous **finissons**	**Finiss-**	Il **finissait**
Boire	Nous **buvons**	**Buv-**	Il **buvait**

First and second person singular:

The ***imparfait*** is formed by dropping the **-ons** ending from the present "**nous**" form of the verb and adding the imparfait ending for the 1st and 2nd person singular (je/tu): **-ais.**

	Présent	Imparfait stem	Imparfait (JE)	Imparfait (TU)
Parler	Nous parlons	**Parl-**	Je parlais	Tu parlais
Finir	Nous finissons	**Finiss-**	Je finissais	Tu finissais
Boire	Nous buvons	**Buv-**	Je buvais	Tu buvais

Example:

Marie dînait au restaurant avec son petit ami.

Marie was having dinner in a restaurant with her boyfriend.

There are four clues that will help you recognise the third person singular imperfect verb forms:

1. Verbs in the imparfait (using singular persons: je, tu, il) end in a stressed sound (-ais/ -ait) which is very important to listen for when deciding if something occurred in the past or present. (Remember, the present tense forms are unaccented).
2. The past tense imparfait (third person) of regular verbs is formed by dropping the -ons ending from the présent indicative "nous" form of the verb and adding the imparfait endings: – ait
3. The past tense imparfait (1st and 2nd person) of regular verbs is formed by dropping the -ons ending from the present indicative "nous" form of the verb and adding the imparfait endings: – ais. Although spelled differently, the first, second and third person forms sound the same.

4. Foreign language learners are sensitive to position within an utterance. The easiest forms to process are those located in initial position within an utterance. The second easiest forms to process occur in utterance final position. The most difficult forms to process are those that occur in the middle parts of utterances, which is where you'll find these verbs. So, listen for sound and the stress.

In the activities that follow, we will practice hearing and interpreting the French past tense: "l'imparfait".

Activity 1: Zinédine Zidane: avant et après…

- **Step 1**

Listen to the following statements made by a journalist about the life of Zinédine Zidane and decide whether each statement is referring to his past life as a professional football player or his life now as a retired football player.

	Professional football player	Retired football player
	☐	☐
	☐	☐
	☐	☐
	☐	☐
	☐	☐
	☐	☐
	☐	☐
	☐	☐

- **Step 2**

Now decide if Zinédine Zidane was busier when he was a professional football player or now that he is retired.

Activity 2: **Cécile's holidays**

Step 1

Read the following statements that Cécile made about her holidays when she was a student and decide whether there are similar *(similaire)* or different (*différent*) to your activities during your last holidays.

Quand elle était étudiante et en vacances, elle…

	Similaire	Différent
1. … allait à la plage tous les jours	❑	❑
2. … faisait du ski nautique	❑	❑
3. … se baignait dans la mer	❑	❑
4. … mangeait au restaurant	❑	❑
5. … dormait beaucoup	❑	❑
6. … écoutait de la musique	❑	❑
7. … sortait le soir avec ses amis	❑	❑
8. … se couchait tard	❑	❑

Step 2

Now decide in pairs whether it was an interesting or a boring holiday.

Activity 3: Things people were doing last summer or now.

Listen to the following statements and decide whether each statement refers to an activity that was taking place last summer or takes place now.

LAST SUMMER	NOW
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑
❑	❑

Activity 4: **Stress!**

You will hear a series of sentences about what Cécile was doing last week. Decide if what you hear is something that relieved her stress or contributed to her being stressed.

- **Step 1**

RELIEVED STRESS	CONTRIBUTED TO STRESS
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐

- **Step 2**

Who was more stressed last week, you or Cécile?

Activity 5: **WHAT'S APPROPRIATE?**

- **Step 1**

Read each sentence then decide whether it was typical (typique) **or not** (pas typique) **of your lecturer's behaviour when she or he was a student.**

Mon professeur....

	C'était typique	Ce n'était pas typique
1. ... dormait toute la journée.	❑	❑
2. ... travaillait chez Mac Donald.	❑	❑
3. ... faisait la fête tous les soirs.	❑	❑
4. ... notait les examens.	❑	❑
5. ... venait à l'université en voiture.	❑	❑
6. ... préparait sa classe.	❑	❑
7. ... se couchait à 5 heures du matin.	❑	❑
8. ... portait un jean et des baskets.	❑	❑
9. ... écoutait de la musique "garage."	❑	❑
10. ... lisait le journal tous les jours.	❑	❑

- **Step 2**

Which statement do you think is the least typical for your lecturer to have done? And why?

Activity 6: **Noël**

- **Step 1**

Read the following activities and indicate whether you were doing similar (similaire) or different (différent) things last Christmas.

	SIMILAIRE	DIFFERENT
1. J'étais avec ma famille.	❑	❑
2. Je décorais le sapin de Noël.	❑	❑
3. J'envoyais des cartes de Noël.	❑	❑
4. J'allais à la messe de minuit.	❑	❑
5. J'avais beaucoup de cadeaux.	❑	❑
6. Je buvais du champagne.	❑	❑
7. Je regardais un film classique à la télévison.	❑	❑
8. Je faisais mon portfolio.	❑	❑
9. Je jouais avec ma X-Box.	❑	❑
10. Je mangeais de la dinde.	❑	❑

- **Step 2** Compare your answers with your partner. How similarly did the two of you spend last Christmas?

Activity 7: First day at university: what a day!

- **Step 1**

Listen to the following story a student told about his first day at university and decide which statements accurately describe what was going on:

L'étudiant…

	VRAI	FAUX
… voulait arriver à l'heure à l'université.	❑	❑
… se levait à 6h30.	❑	❑
… mettait une vieille chemise.	❑	❑
… ne prenait pas de petit-déjeuner.	❑	❑
… voulait prendre le métro.	❑	❑
… prenait le bus.	❑	❑
… prenait un taxi.	❑	❑
… racontait son histoire au chauffeur de taxi.	❑	❑
… avait de l'argent pour payer le taxi.	❑	❑
…était beaucoup en retard.	❑	❑

- **Step 2** With a partner, decide if the day you heard described was similar or not to your first day at university.

Activity 8 (adapted from Farley, 2004): **In their teens…**

- **Step 1**

Imagine what your parent's life was like as a teenager many years ago. What about another relative and your instructor? Can you imagine who partied too much? Who argued with his/her teacher a lot? Read over each statement and decide whether each individual (parent, relative or instructor) would have been doing these things or not.

Il/Elle…

	Parent	Relative	Instructor
1. … se disputait avec son professeur.	❑	❑	❑
2. … ne passait pas son baccalauréat.	❑	❑	❑
3. … trichait aux examens.	❑	❑	❑
4. … avait de très bonnes notes.	❑	❑	❑
5. … buvait de l'alcool à 15 ans.	❑	❑	❑
6. … faisait la fête toute la nuit.	❑	❑	❑
7. … visitait beaucoup de pays.	❑	❑	❑
8. … organisait des soirées étudiantes.	❑	❑	❑

- **Step 2**

Find out if your instructor used to do any of the above. Are you surprised?

Activity 9: **A typical student's day**

- **Step 1**

Here are things that describe what your lecturer would do regularly when she was a university student. Put them in chronological order.

Quand elle était étudiante, elle…

1. … rentrait chez elle en train. ❐
2. … faisait des courses au supermarché. ❐
3. … allait à l'université en vélo. ❐
4. … lisait ses cours avant de se coucher. ❐
5. … allait en classe. ❐
6. … cherchait des articles à la bibliothèque. ❐
7. … ne prenait pas de petit-déjeuner sauf le weekend. ❐
8. … se levait à 7h30 pendant la semaine. ❐
9. … préparait un bon dîner. ❐
10. … regardait la television. ❐

- **Step 2**

Is this routine similar to your routine? How many things are similar to your day?

Activity 10 **Hier et aujourd'hui...**

You will hear 10 sentences about what was going on in the past and what goes on today. Tick whether the action/event is in the present or in the past.

	Past	Présent
1.	❑	❑
2.	❑	❑
3.	❑	❑
4.	❑	❑
5.	❑	❑
6.	❑	❑
7.	❑	❑
8.	❑	❑
9.	❑	❑
10.	❑	❑

- **Step 2**

In your pairs, give as many details as you can remember by completing the following sentences. The group with the most details wins. You have two minutes.

1. On écrivait beaucoup de _____.
2. On habitait _____ .
3. On faisait du_____.
4. On se couchait_____.
5. On ne regardait pas _____.
6. On écoutait _____.

APPENDIX B2

Instructional Packet TI

The French "*Imparfait*"

This is your pack of material for this lesson. Write your name below so that your instructor can give it back to you after she collects them.

Your name:

_____

Please indicate here what your native language (s) is (are):

_____

_____

Instructional Packet TI

The French Imparfait

We often use sentences in the past tense to describe a past event or an on-going action in the past.

E.g. ***This morning I was speaking to my mother on the phone.***

In this sentence we are using the imperfect.

In French, the imperfect, is called ***l'imparfait.*** This past tense has different forms from the present tense **E.g. Ce matin, je <u>parlais</u> à ma mère au téléphone.**

2. <u>USE</u>

The imperfect tense (**l'imparfait**) has two primary uses:

5. To describe on-going actions and states of being in the past: The *imparfait* is used to describe people, places, conditions or situations in the past.
6. To state habitual actions in the past.

3. <u>FORMATION</u>

For all regular verbs and all persons the *imparfait* is formed by dropping the -ons ending from the **<u>present</u>** "nous" form of the verb and adding the imparfait endings:

-ais
-ais
-ait
-ions
-iez
-aient

Avant,	j'habitais à Londres. tu habitais à Londres. il/elle/on habitait à Londres. nous habitions à Londres. vous habitiez à Londres. ils/elles habitaient à Londres.

	Présent	Imparfait stem	Imparfait
Parler	Nous **parlons**	**Parl-**	Je **parlais**
Finir	Nous **finissons**	**Finiss-**	Tu **finissais**
Boire	Nous **buvons**	**Buv-**	Il **buvait**
Parler	Nous **parlons**	**Parl-**	Nous **parlions**
Finir	Nous **finissons**	**Finiss-**	Vous **parliez**
Boire	Nous **buvons**	**Buv-**	Ils/elles **parlaient**

YOUR TURN :

Travailler : Aujourd'hui je travaille sur mon ordinateur.
Hier, je _____ sur mon ordinateur.

Téléphoner : Aujourd'hui je téléphone à ma mère.
Hier, je _____ à ma mère.

Se lever : Le matin, je me lève à 7.30
Pendant les vacances, je _____ à 9.00

Activity 1: **Zinédine Zidane: avant et après**

A - Fill in the blanks with what you think the ex-football player, Zinédine Zidane, does nowadays that he is retired. Use the following verbs. Some verbs may be used more than once.

passer, s'occuper de, téléphoner, participer

Aujourd'hui, Zinédine Zidane…

1._____ du temps avec sa famille.

2._____ à beaucoup de diners officiels.

3. _____ de ses enfants.

5._____ à Thierry Henri pour discuter.

B - Now repeat the above but this time think of Zinédine Zidane when he was a professional football player. Use the following verbs.

jouer, gagner, s'entrainer, marquer

Avant, Zinédine Zidane…

1._____ au football dans le monde entier

2._____ beaucoup de coupes.

3._____ avec Ronaldo.

4._____ beaucoup de buts.

Activity 2: **Follow the model to create sentences.**

MODEL: Maintenant je marche très peu, mais avant_____

Maintenant je marche très peu mais avant *je marchais beaucoup*.

1. Maintenant je fais peu de sport, mais avant_____

2. Maintenant il se baigne peu, mais avant _____

3. Maintenant tu manges peu, mais avant _____

4. Maintenant elle dort peu, mais avant _____

5. Maintenant j'écoute peu la radio, mais avant _____

6. Maintenant il sort peu, mais avant _____

7. Maintenant on se couche tôt, mais avant_____

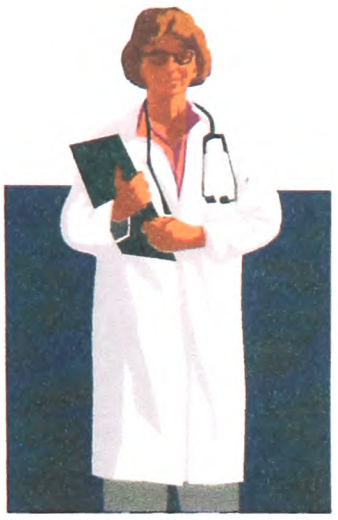
8. Maintenant je vais très peu au cinéma, mais avant _____

Activity 3: **What people used to do**

Follow the model and describe how people used to live before.

MAINTENANT	AVANT
Ex : Les femmes travaillent à l'intérieur	**Les femmes travaillaient à l'extérieur**
1. On a une voiture.	_____
2. Nous allons beaucoup en vacances.	_____
3. Les enfants regardent beaucoup la télévision.	_____
4. Les jeunes dansent beaucoup.	_____
5. On voyage beaucoup.	_____
6. On visite beaucoup de pays	_____
7. Les jeunes étudient beaucoup.	_____
8. On part en vacances	_____

Activity 4: **Here are some things Caroline is doing today. Follow the model and state what she used to do or how she used to be.**



MAINTENANT	**AVANT**
1 .Elle pèse 55 kilos.	**Elle pesait 105 kilos**
2. Elle fait une taille 38.	_____
3. Elle ne fume pas.	_____
4. Elle travaille beaucoup.	_____
5. Elle a besoin de 1500 calories par jour.	_____
6. Elle vient au travail en vélo.	_____
7. Elle a besoin de manger peu.	_____
8. Elle parle de se marier.	_____

Activity 5: **WHAT'S APPROPRIATE?**

- **Step 1**

Use the indicated verbs in brackets to describe a typical student's day during the last holidays.

Pendant les vacances d'été, Paul…

1. ... (dormir) _____ toute la journée.
2. … (travailler) _____ chez Mac Donald.
3. … (faire)_____ la fête tous les soirs.
4. … (se coucher) _____ à 5 heures du matin.
5. … (écouter) _____ de la musique "garage."
6. ... (aller) _____ chez des amis.
7. ... (étudier) _____ très peu.
8. … (téléphoner) _____ à ses amis.
9. … (préparer) _____ ses examens.
10. … (venir) _____ à la bibliothèque de temps en temps.

Activity 6: **Noël**

Use the verbs given below and write 8 sentences about what you would do at Christmas when you were a child.

Aimer, décorer, envoyer, aller, avoir, boire, regarder, jouer, faire, manger

1. Je _____
2. Je _____
3. Je _____
4. Je _____
5. Je _____
6. Je _____
7. Je _____
8. Je _____
9. Je _____
10. Je. _____

Activity 7: **First day at university: what a day!**

Read the text below about the story of a student first day at university and fill in the gaps using the imparfait.

Paul parle à son ami Mark. Il lui raconte son premier jour à l'université :

« Mes premiers cours commençaient à 9.00 et je (vouloir) _____ vraiment arriver à l'université à l'heure. Je (se lever) _____ tout excité et heureux d'aller à l'université.

Après ma douche je (mettre) _____ ma plus belle chemise et ma plus belle veste. Je (prendre) _____ un petit- déjeuner rapide en écoutant les informations du matin à la télé. Et je suis parti de la maison aussi vite que possible. Il était déjà 8h00 donc je (décider) _____ donc de prendre le métro pour aller plus vite. Il y (avoir) _____ beaucoup de monde dans le métro, on ne pouvait pas respirer. Il y avait beaucoup de retard et les métros ne (venir) _____ pas. Je décidais donc de prendre le bus. Mais j'attendais, j'attendais et les bus ne n'arrivaient pas: il était maintenant 8h30. Je (prendre) _____ donc un taxi. Une fois dans le taxi je (raconter) _____ mon histoire au chauffeur qui riait si fort qu'on l'entendait dans la rue. A 9h00 j'arrivais enfin à l'université, je (sortir) _____ du taxi pour payer mais impossible de trouver mon portefeuille, il était dans mon autre veste: pas d'argent ni de carte bancaire pour payer. A 9h02 je remontais dans le taxi et je repartais chez moi pour aller chercher mon portefeuille. Pas de chance et en plus j'étais TRES en retard pour mon premier cours.

Affective Activity 8

In their teens…

Imagine what your parent's life was like as a teenager many years ago. Use the verbs below to write sentences about things they did in their teens.

1. Mon père (se disputer) _____ souvent avec son professeur.

2. Ma mère (passer) _____ ses vacances avec des amies.

3. Mon père (tricher) _____ aux examens.

4. Ma mère (avoir) _____ de très bonnes notes.

5. Mon père (boire) _____ de l'alcool à 15 ans.

6. Ma mère (faire) _____ la fête toute la nuit.

7. Mon père (visiter) _____ beaucoup de pays.

8. Ma mère (organiser) _____des soirées étudiantes.

Activity 9: **A typical student's day**

Transform each sentence according to the model.

MODEL : **Elle (étudier) _____ à l'université**

Elle <u>étudiait</u> à l'université.

1. Elle (selever) _____ à 7h30.
2. Elle (prendre) _____ son petit-déjeuner.
3. Elle (aller) _____ à l'université en vélo.
4. Elle (aller) _____ en classe.
5. Elle (chercher) _____ des articles à la bibliothèque.
6. Elle (faire) _____ des courses au supermarché.
7. Elle (rentrer) _____ chez elle en train.
8. Elle (préparer) _____ un bon dîner.
9. Elle (regarder) _____ la télévision.
10. Elle (lire) _____ses cours avant de se coucher.

Activity 10 **Hier et aujourd'hui....**

Read the following text about what was going on in the past. Use the indicated verbs in brackets to fill in the gaps using the imparfait.

Avant la vie (être) _____ très différente : on (se lever) _____ très tôt et on (habiter) _____ surtout à la campagne, on n' (utiliser) _____ pas les ordinateurs mais on (écrire) _____ beaucoup de lettres, on ne (regarder) _____ pas la télévision aussi souvent mais on (écouter) _____ beaucoup la radio et on (faire) _____ beaucoup de sport. On (avoir) _____ une meilleure qualité de vie et pourtant on (vivre) _____ moins longtemps !

APPENDIX C

TESTS :

Pre-tests (Appendix C1a, C1b, C2a, C2b, C3a & C3b)

Post-test (Appendix C4a, C4b, C5a, C5b, C6a & C6b)

APPENDIX C1a Pre-test A: *French Imparfait* - Student version

PRE-TEST A

NAME: _____ DATE: _____

1. **You will hear 20 sentences and decide whether the action is referring to an action in the present, in the past or if you are not sure. You have 8 seconds after hearing the sentence to tick your answer. You must tick ☑ either Present, Past or Not Sure.**

	Present	Past	Not Sure
1	❐	❐	❐
2	❐	❐	❐
3	❐	❐	❐
4	❐	❐	❐
5	❐	❐	❐
6	❐	❐	❐
7	❐	❐	❐
8	❐	❐	❐
9	❐	❐	❐
10	❐	❐	❐
11	❐	❐	❐
12	❐	❐	❐
13	❐	❐	❐
14	❐	❐	❐
15	❐	❐	❐
16	❐	❐	❐
17	❐	❐	❐
18	❐	❐	❐
19	❐	❐	❐
20	❐	❐	❐

2. Put the verbs in brackets in the correct form.

Hier j'_____ (être) au supermarché avec mon ami Charles. A côté de moi, à ma droite, une jeune femme grande et blonde _____(porter) des lunettes de soleil noires. Bizarre dans un supermarché, non ?

Je _____(montrer) donc discrètement cette femme blonde à Charles. Elle _____ (marcher) dans notre direction puis quelques secondes plus tard, elle _____ (enlever) ses lunettes de soleil et nous _____ (faire) un sourire tout en parlant sur son portable. Je _____ (rester) paralysée, je ne _____ (pouvoir) plus parler et je _____(penser) « oh mon Dieu, je rêve ! ». Charles me dit alors: « cette femme blonde aux lunettes de soleil : c'est Madonna ! » et deux minutes plus tard Charles _____ (avoir) son autographe.

APPENDIX C1b Pre-test A: *French Imparfait* – Instructor's version

PRE-TEST A - *French Imparfait* – Instructor's version

Participants have to listen to the sentences ONCE and then indicate whether the sentences they heard are in the present, the past or whether they are not sure. Of these sentences, 10 are in the present tense (distracters) and 10 items are in the French past tense Imperfect (target items)

Sentences in blue are in the "imparfait".

- INTERPRETATION TASK: Transcript of the CD and Answers

		Present	Past
1	Je parle à mon père au téléhone.	☐	☐
2	**Tu chantais sous la douche.**	☐	☑
3	**Il discutait avec son frère.**	☐	☑
4	Elle travaille dans sa chambre.	☐	☐
5	**Tu habitais aux Etats-Unis.**	☐	☑
6	**J'aimais le tennis et le football.**	☐	☑
7	**Il rêvait de l'Australie et de ses kangourous.**	☐	☑
8	Je pense à ma mère en France.	☐	☐
9	**Il parlait très bien le français, l'italien et le chinois.**	☐	☑
10	Tu manges trop de chocolat.	☐	☐
11	Je voyage beaucoup surtout en Europe.	☐	☐
12	Tu danses très bien.	☐	☐
13	Elle joue au tennis et au badmington.	☐	☐
14	**Je cuisinais beaucoup de desserts au chocolat.**	☐	☑
15	Il aide son frère avec ses exercices de français.	☐	☐
16	**Tu envoyais des lettres à ta mère.**	☐	☑
17	Je regarde la télévision jusqu'à 22 heures.	☐	☐
18	**Tu donnais des cours de français et d'espagnol.**	☐	☑
19	**Elle arrivait en retard à l'école une fois par semaine.**	☐	☑
20	J'adore les croissants, les pains au chocolat et les brioches.	☐	☐

SCORING FOR THE INTERPRETATION TASK:

Scoring for the interpretation task consists of 1 versus 0 point system per item for a total possible of 10 points. A subject will receive 1 point if the target sentence is assigned correctly past tense reference and will receive 0 point if the tense assignment is wrong or the subject indicates an inability to determine the tense.

- **PRODUCTION TASK**

The production task consists of 10 written items with blanks in which participants have to complete the sentence with a correct verb cued by an infinitive in parentheses.

3. Put the verbs in brackets in the correct form.

Hier j'_____ (être) au supermarché avec mon ami Charles. A côté de moi, à ma droite, une jeune femme grande et blonde _____(porter) des lunettes de soleil noires. Bizarre dans un supermarché, non ?
Je _____(montrer) discrètement cette femme blonde à Charles. Elle _____ (marcher) dans notre direction, quelques secondes plus tard, elle _____ (enlever) ses lunettes de soleil et nous _____ (faire) un sourire. Je _____ (rester) paralysée, je ne _____ (pouvoir) pas parler et je _____(penser) « oh mon Dieu, je rêve ! ». Charles me dit alors: « cette femme blonde aux lunettes de soleil : c'est Madonna ! » et deux minutes plus tard Charles _____ (avoir) son autographe.

SCORING FOR THE PRODUCTION TASK:

Scoring for the production task consists of a 2, 1, 0 point system for a possible total of 20 points. A participant will receive 2 points if the sentence completion contains a verb in the correct past tense form. If the verb is in the past tense but is the wrong person or if the verb is in the past tense but the participant has switched verb category endings, a score of 1 point will be allocated to the participant. Any other response will receive a score of 0 point.

APPENDIX C2a Pre-test B: *French subjunctive* - Student version

PRE-TEST B

You will hear the end of 20 sentences. Tick the appropriate beginning for each sentence you hear in the table below. If you are not sure, please tick ☑ *Je ne suis pas sûr(e).* You will have 8 seconds after hearing the end of the sentence to tick your answer.

1	❑ Je pense qu'elle ❑ Je ne suis pas sûr qu'elle ❑ *Je ne suis pas sûr(e)*
2	❑ Je ne crois pas qu'il ❑ Je pense qu'il ❑ *Je ne suis pas sûr(e)*
3	❑ Je doute qu'il ❑ Je sais qu'il ❑ *Je ne suis pas sûr(e)*
4	❑ Je ne pense pas qu'il ❑ Je crois qu'il ❑ *Je ne suis pas sûr(e)*
5	❑ Je crois qu'il ❑ Je ne pense pas qu'il ❑ *Je ne suis pas sûr(e)*
6	❑ Je ne pense pas qu'elle ❑ Je suis persuadée qu'elle ❑ *Je ne suis pas sûr(e)*
7	❑ Je doute qu'il ❑ Je crois qu'il ❑ *Je ne suis pas sûr(e)*
8	❑ Je pense qu'il ❑ Je ne crois pas qu'il ❑ *Je ne suis pas sûr(e)*
9	❑ Je crois qu'elle ❑ Je doute qu'elle ❑ *Je ne suis pas sûr(e)*
10	❑ Je sais qu'elle ❑ Je ne crois pas qu'elle ❑ *Je ne suis pas sûr(e)*

11	❑ Je sais qu'il ❑ Je doute qu'il ❑ *Je ne suis pas sûr(e)*
12	❑ Je sais qu'elle ❑ Je ne crois pas qu'elle ❑ *Je ne suis pas sûr(e)*
13	❑ Je pense qu'il ❑ Je ne crois pas qu'il ❑ *Je ne suis pas sûr(e)*
14	❑ Je crois qu'il ❑ Je doute qu'il ❑ *Je ne suis pas sûr(e)*
15	❑ Je suis sûr qu'elle ❑ Je ne suis pas certain qu'elle ❑ *Je ne suis pas sûr(e)*
16	❑ Je ne crois pas que mon chat ❑ Je pense que mon chat ❑ *Je ne suis pas sûr(e)*
17	❑ Je ne crois pas qu'il ❑ Je pense qu'il ❑ *Je ne suis pas sûr(e)*
18	❑ Je crois qu'elle ❑ Je doute qu'elle ❑ *Je ne suis pas sûr(e)*
19	❑ Je doute qu'elle ❑ Je sais qu'elle ❑ *Je ne suis pas sûr(e)*
20	❑ Je pense qu'elle ❑ Je ne pense pas qu'elle ❑ *Je ne suis pas sûr(e)*

2. Complete the following sentences by putting the verb in brackets in the correct form.

1 Je ne pense pas que le français _____ (être) facile.

2 Je pense qu'elle _____ (suivre) des cours de danse.

3 Je pense qu'il _____ (vouloir) se remarier.

4 Je doute que Marie _____ (prendre) l'avion seule.

5 Je ne suis pas sûr qu'il _____ (avoir) envie d'aller au cinéma.

6 Je sais que Paul _____ (venir) souvent à la maison.

7 Je ne suis pas certain qu'elle me _____ (rejoindre) en Italie.

8 Je ne crois pas qu'elle _____ (conduire) bien.

9 Je pense que Jean _____ (réussir) bien dans son travail.

10 Je crois qu'il _____ (savoir) jouer du piano.

APPENDIX C2b Pre-test B: *French Subjunctive* – Instructor's version

PRE-TEST B - *French Subjunctive* – Instructor's version

Participants have to listen to the end of 20 sentences and then indicate whether the sentences they heard are in the subjunctive after expressions of doubt. Of these sentences 10 are in the present tense of the indicative (distracters) and 10 items are in the subjunctive. They have 8 seconds after hearing the end of the sentence to tick their answer. **Sentences in blue are in the subjunctive**.

- INTERPRETATION TASK: Transcript of the CD and Answers

1	☑ **Je doute qu'il** ☐ Je sais qu'il	vienne avec nous.
2	☐ Je ne pense pas qu'elle ☐ Je suis persuadée qu'elle	va en vacances à Milan.
3	☑ **Je doute qu'il** ☐ Je crois qu'il	sache la réponse.
4	☐ Je pense qu'elle ☐ Je ne suis pas sûr qu'elle	lit souvent le journal.
5	☐ Je crois qu'elle ☑ **Je doute qu'elle**	aille régulièrement à la piscine.
6	☐ Je sais qu'elle ☑ **Je ne crois pas qu'elle**	prenne de la drogue.
7	☐ Je pense qu'il ☑ **Je ne crois pas qu'il**	ait beaucoup de travail
8	☐ Je ne pense pas qu'il ☐ Je crois qu'il	conduit une moto.
9	☐ Je pense qu'il ☐ Je ne crois pas qu'il	s'entend bien avec ses parents.
10	☐ Je crois qu'il ☐ Je doute qu'il	fait une fête.
11	☐ Je sais qu'elle ☐ Je ne crois pas qu 'elle	dort beaucoup.
12	☑ **Je ne crois pas que mon chien** ☐ Je pense que mon chien	puisse nager.
13	☑ **Je ne crois pas qu'il** ☐ Je pense qu'il	sache chanter.
14	☐ Je sais qu'il ☐ Je doute qu'il	écrit des poèmes.
15	☐ Je pense qu'elle ☐ Je ne pense pas qu'elle	fait beaucoup de sport.
16	☑ **Je doute qu'elle** ☐ Je sais qu'elle	réussisse ses examens.
17	☐ Je crois qu'elle ☐ Je doute qu'elle	peint.
18	☐ Je ne crois pas qu'il ☐ Je pense qu'il	ment.
19	☐ Je crois qu'il ☑ **Je ne pense pas qu'il**	veuille un nouvel ordinateur.
20	☐ Je suis sûr qu'elle ☑ **Je ne suis pas certain qu'elle**	fasse bien la cuisine.

SCORING FOR THE INTERPRETATION TASK:

Scoring for the interpretation task consists of 1 versus 0 point system per item for a total possible of 10 points. A subject will receive 1 point if the target sentence is assigned correctly subjunctive reference and will receive 0 point if the tense assignment is wrong.

- **PRODUCTION TASK**

The production task consists of 10 written items with blanks in which participants have to complete the sentence with the correct form of the verb in the subjunctive cued by an infinitive in parentheses. Of these sentences 5 are in the present tense (distracters) and 5 items are in the subjunctive.

Sentences in blue are in the subjunctive.

1 Je ne pense pas que le français soit facile.

2 Je pense qu'elle suit des cours de danse.

3 Je pense qu'il veut se remarier.

4 Je doute que Marie prenne l'avion seule.

5 Je ne suis pas sûr qu'il ait envie d'aller au cinéma.

6 Je sais que Paul vient souvent à la maison.

7 Je ne suis pas certain qu'elle me rejoigne en Italie.

8 Je ne crois pas qu'elle conduise bien.

9 Je pense que Jean réussit bien dans son travail.

10 Je crois qu'il sait jouer du piano.

SCORING FOR THE PRODUCTION TASK:

Scoring for the production task consists of a 4, 2, 0 point system for a possible total of 20 points. A participant will receive 4 points if the sentence completion contains a verb in the correct subjunctive form. If the verb is in the subjunctive but is the wrong person or if the verb is in the subjunctive but the participant has switched verb category endings, a score of 2 points will be allocated to the participant. Any other response will receive a score of 0 point.

APPENDIX C3a Pre-test C: *French causative* - Student version

PRE-TEST C

NAME: _____ DATE: _____

1. You will hear 20 sentences. For each sentence you hear, answer the question that accompanies it and determine who is doing the activity. You have 8 seconds after hearing the sentence to answer the question. You only need to write someone's name to answer the question. You may also tick "*Je ne suis pas sûr(e)*" (I am not sure) if appropriate.

		JE NE SUIS PAS SUR(E)
1	Who watches the film?_____	❒
2	Who eats the soup ?_____	❒
3	Who takes the car ?_____	❒
4	Who does the dishes?_____	❒
5	Who does the housework ?_____	❒
6	Who watches the photos ? _____	❒
7	Who does the homework ?_____	❒
8	Who walks the dog ?_____	❒
9	Who is having a bath?_____	❒
10	Who does the cooking ?_____	❒
11	Who plays on the computer?_____	❒
12	Who is eating?_____	❒
13	Who goes to the language centre?_____	❒
14	Who brings the book back to the library ?_____	❒
15	Who does the ironing ?_____	❒
16	Who writes the letter ?_____	❒
17	Who draws ? _____	❒
18	Who washes the car ?_____	❒
19	Who drinks milk every morning?_____	❒
20	Who eats the cake?	❒

2. **For each picture that is shown on the overhead, complete the sentence to describe it and determine who is doing the activity. You will have 10 seconds to complete each sentence.**

1. Jean fait _____
2. Luc fait _____
3. Claudine fait _____
4. Marc fait _____
5. Diane fait _____
6. Marie fait _____
7. Paul fait _____
8. Philippe fait _____
9. Laura fait _____
10. Sara fait _____

APPENDIX C3b Pre-test C: French causative - Instructor Version

PRE-TEST C - *French Causative* – Instructor's version

Participants have to listen to 20 sentences and then indicate who is performing the action by answering the questions or by ticking "I am not sure" if they don't know. Of these sentences, 10 are ***not*** *using the causative (distracters) and 10 items are using the causative (target items).* **Sentences in blue are using the causative.**

- INTERPRETATION TASK: Transcript of the CD & Answers

1	**Charles fait regarder le film à Claire.**	**Who watches the film?**	**Claire**
2	Emma mange la soupe de Mark.	Who eats the soup ?	
3	Léo prend la voiture de Tom.	Who takes the car ?	
4	Sandra fait la vaisselle de Louis.	Who does the dishes?	
5	**Sophie fait faire le ménage à Paul.**	**Who does the housework ?**	**Paul**
6	**Louise fait voir les photos à Marie.**	**Who watches the photos ?**	**Marie**
7	Simon fait les devoirs de Bob.	Who does the homework ?	
8	**Zoë fait promener le chien à Sarah.**	**Who walks the dog ?**	**Sarah**
9	**Je fais prendre un bain à Théo.**	**Who is having a bath?**	**Théo**
10	Juliette fait la cuisine pour Nathalie.	Who does the cooking ?	
11	Laura joue sur l'ordinateur de Mark.	Who plays on the computer ?	
12	**Olivia fait manger Charlotte.**	**Who is eating?**	**Charlotte**
13	**Mon professeur me fait aller au centre de langue une fois par semaine.**	**Who goes to the language centre?**	**Me**
14	**Robert me fait rendre un livre à la bibliothèque.**	**Who brings the book back to the library ?**	**Me**
15	Elle fait le repassage pour sa mère.	Who does the ironing ?	
16	**Mon père fait écrire une lettre à ma soeur.**	**Who writes the letter ?**	**Ma soeur** *(my sister)*
17	Mon frère fait un dessin pour ma mère.	Who draws ?	
18	Ma tante nettoie la voiture de mon père.	Who washes the car ?	
19	**Son grand-père fait boire du lait à Steve chaque matin.**	**Who drinks milk every morning?**	**Steve**
20	Mon oncle mange le gâteau de ma tante.	Who eats the cake ?	

SCORING FOR THE INTERPRETATION TASK PRE-TEST C:

Scoring for the interpretation task consists of 1 versus 0 point system per item for a total possible of 10 points. A participant will receive 1 point if the person performing the action is identified correctly (target sentence is assigned correctly causative reference) and will receive 0 point if the person performing the action is wrong or the participant indicates an inability to determine the tense.

- **PRODUCTION TASK**

The production task consists of 10 written items with blanks in which participants have to complete the sentence with a correct verb cued by an infinitive in parentheses. Of these sentences, 5 are ***not*** *using the causative (distracters) and 5 items are using the causative (target items).* **Sentences in blue are in the French causative.**

For each picture that is shown on the overhead, complete the sentence to describe it and determine who is doing the activity. You will have 10 seconds to complete each sentence.

1. Jean fait la valise de Philippe.
2. **Luc fait laver la voiture à Louis.**
3. **Claudine fait promener le chien à Diane**
4. **Marc fait lire un livre à Jean.**
5. Diane fait du ski
6. **Marie fait faire la vaisselle à Sylvie.**
7. Paul fait un cadeau à Louis.
8. **Philippe fait acheter du lait à Richard.**
9. Laura fait un gâteau pour Joseph.
10. Sara fait de l'escalade.

SCORING FOR THE PRODUCTION TASK:

Scoring for the production task consists of a 4, 2, 0 point system for a possible total of 20 points. A participant will receive 2 points if the sentence completion contains a verb in the correct form using the causative. If the causative is used but the wrong person is used or if the participant has switched verb category endings, a score of 1 point will be allocated to the participant. Any other response will receive a score of 0 point.

APPENDIX C4a Post-test A: *French imparfait* - Student Version

POST-TEST A

NAME: _____ DATE: _____

1. You will hear 20 sentences and decide whether the action is referring to an action in the present, in the past or if you are not sure. You have 5 seconds after hearing the sentence to tick your answer. You must tick ☑ either Present, Past or Not Sure.

	Present	Past	Not Sure
1	❒	❒	❒
2	❒	❒	❒
3	❒	❒	❒
4	❒	❒	❒
5	❒	❒	❒
6	❒	❒	❒
7	❒	❒	❒
8	❒	❒	❒
9	❒	❒	❒
10	❒	❒	❒
11	❒	❒	❒
12	❒	❒	❒
13	❒	❒	❒
14	❒	❒	❒
15	❒	❒	❒
16	❒	❒	❒
17	❒	❒	❒
18	❒	❒	❒
19	❒	❒	❒
20	❒	❒	❒

2. Put the verbs in brackets in the correct form.

Quand je (être) _____ au Pôle Nord il (faire) _____ très froid mais toujours beau! Il y (avoir) _____ une famille de pingouins avec nous à côté de la maison! Le père pingouin (passer) _____ beaucoup de temps sur la glace pour y fabriquer un nid. Il (aller)_____ de temps en temps dans l'eau pour pêcher des poissons. La mère pingouin (couver) _____ sur ses oeufs à cette période (en général les mères pingouins pondent 6 oeufs) alors que le père pingouin (s'occuper) _____ des autres bébés pingouins. Le père pingouin (mesurer) _____ environ 50 cm, il (être) _____ blanc et gris et il (aimer) _____ rester avec nous... Quel animal incroyable!

APPENDIX C4b Post-test A: *French imparfait* - Instructor Version

POST-TEST A - *French Imparfait* – Instructor's version

Participants have to listen to the sentences ONCE and then indicate whether the sentences they heard are in the present, the past or whether they are not sure. Of these sentences, 10 are in the present tense (distractors) and 10 items are in the French past tense "Imparfait" (target items). **Sentences in blue are in the "imparfait".**

1. You will hear 20 sentences and decide whether the action is referring to an action in the present, in the past or if you are not sure. You have 5 seconds after hearing the sentence to tick your answer. You must tick ☑ either Present, Past or Not Sure.

- INTERPRETATION TASK: Transcript of the CD & Answers

		Present	Past
1	**Je parlais à mon père au téléphone.**	❒	☑
2	Tu chantes sous la douche.	❒	❒
3	Il discute avec son frère.	❒	❒
4	**Elle travaillait dans sa chambre.**	❒	☑
5	Tu habites aux Etats-Unis.	❒	❒
6	J'aime le tennis et le football.	❒	❒
7	Il rêve de l'Australie et de ses kangourous.	❒	❒
8	**Je pensais à ma mère en France.**	❒	☑
9	Il parle très bien le français, l'italien et le chinois.	❒	❒
10	**Tu mangeais trop de chocolat.**	❒	☑
11	**Je voyageais beaucoup surtout en Europe.**	❒	☑
12	**Tu dansais très bien.**	❒	☑
13	**Elle jouait au tennis et au badmington.**	❒	☑
14	**Je cuisinais beaucoup de desserts au chocolat.**	❒	☑
15	**Il aidait son frère avec ses exercices de français.**	❒	☑
16	Tu envoies des lettres à ta mère.	❒	❒
17	Je regarde la télévision jusqu'à 22 heures.	❒	❒
18	Tu donnes des cours de français et d'espagnol.	❒	❒
19	Elle arrive en retard à l'école une fois par semaine.	❒	❒
20	**J'adorais les croissants, les pains au chocolat et les brioches.**	❒	☑

SCORING FOR THE INTERPRETATION TASK:

Scoring for the interpretation task consists of 1 versus 0 point system per item for a total possible of 10 points. A subject will receive 1 point if the target sentence is assigned correctly past tense reference and will receive 0 point if the tense assignment is wrong or the subject indicates an inability to determine the tense.

- **PRODUCTION TASK**

The production task consists of 10 written items with blanks in which participants have to complete the sentence with a correct verb cued by an infinitive in parentheses.

Quand j'**étais** au Pôle Nord il **faisait** très froid mais toujours beau! Il y **avait** une famille de pingouins avec nous à côté de la maison! Le père pingouin **passait** beaucoup de temps sur la glace pour y fabriquer un nid. Il **allait** de temps en temps dans l'eau pour pêcher des poissons. La mère pingouin **couvait** ses oeufs à cette période (en général les mères pingouins pondent 6 oeufs) alors que le père pingouin **s'occupait** des autres bébés pingouins. Le père pingouin **mesurait** environ 50 cm, il **était** blanc et gris et il **aimait** rester avec nous... Quel animal incroyable!

SCORING FOR THE PRODUCTION TASK:

Scoring for the production task consists of a 2, 1, 0 point system for a possible total of 20 points. A participant will receive 2 points if the sentence completion contains a verb in the correct past tense form. If the verb is in the past tense but is the wrong person or if the verb is in the past tense but the participant has switched verb category endings, a score of 1 point will be allocated to the participant. Any other response will receive a score of 0 point.

APPENDIX C5a Post-test B: *French Subjunctive* - Student Version

POST-TEST B

NAME: _____ DATE: _____

1. You will hear the <u>end</u> of 20 sentences. Tick the appropriate beginning for each sentence you hear in the table below. You will have 5 seconds after hearing the end of the sentence to tick your answer.

1	❑ Je doute que ❑ Je sais qu'il ❑ *Je ne suis pas sûr(e)*
2	❑ Je pense qu'elle ❑ Je ne suis pas sûr qu'elle ❑ *Je ne suis pas sûr(e)*
3	❑ Je doute qu'il ❑ Je crois qu'il ❑ *Je ne suis pas sûr(e)*
4	❑ Je pense qu'il ❑ Je ne suis pas sûr qu'il ❑ *Je ne suis pas sûr(e)*
5	❑ Je crois qu'il ❑ Je ne pense pas qu'il ❑ *Je ne suis pas sûr(e)*
6	❑ Je suis persuadée qu'elle ❑ Je ne pense pas qu'elle ❑ *Je ne suis pas sûr(e)*
7	❑ Je doute qu'il ❑ Je crois qu'il ❑ *Je ne suis pas sûr(e)*
8	❑ Je doute qu'elle ❑ Je crois qu'elle ❑ *Je ne suis pas sûr(e)*
9	❑ Je pense qu'il ❑ Je ne crois pas qu'il ❑ *Je ne suis pas sûr(e)*
10	❑ Je ne crois pas qu'elle ❑ Je sais qu'elle ❑ *Je ne suis pas sûr(e)*
11	❑ Je sais qu'il ❑ Je doute qu'il ❑ *Je ne suis pas sûr(e)*
12	❑ Je sais qu'elle ❑ Je ne pas que mon chien ❑ *Je ne suis pas sûr(e)*
13	❑ Je ne crois pas qu'il ❑ Je pense qu'il ❑ *Je ne suis pas sûr(e)*
14	❑ Je crois qu'il ❑ Je doute qu'il ❑ *Je ne suis pas sûr(e)*
15	❑ Je ne crois pas qu'elle ❑ Je pense qu'elle ❑ *Je ne suis pas sûr(e)*
16	❑ Je ne suis pas cerain qu'elle ❑ Je sais qu'elle ❑ *Je ne suis pas sûr(e)*
17	❑ Je ne crois pas que mon chat ❑ Je pense qu'elle ❑ *Je ne suis pas sûr(e)*
18	❑ Je crois qu'elle ❑ Je doute qu'elle ❑ *Je ne suis pas sûr(e)*
19	❑ Je crois qu'il ❑ Je doute qu'il ❑ *Je ne suis pas sûr(e)*
20	❑ Je pense qu'elle ❑ Je ne pense pas qu'elle ❑ *Je ne suis pas sûr(e)*

2. Complete the following sentences by putting the verb in brackets in the correct form.

1 Je crois que ma soeur _____ (venir) demain.

2 Je ne pense pas qu'elle _____ (prendre) le train. Elle préfère l'avion.

3 Je doute que Louise _____ (pouvoir) aller avec moi en France. Elle travaille tout l'été.

4 Je doute que Paul _____ (boire) beaucoup ce soir car il conduit.

5 Je pense qu'elle _____ (aller) à Paris en Eurostar. C'est moins cher.

6 Je pense que Pierre _____ (devoir) travailler un peu plus s'il veut réussir.

7 Je ne suis pas certaine que cette robe _____ (être) ton style. Je préfère la jupe.

8 Je sais qu'il _____ (vouloir) toujours être le premier partout. Ça m'énerve !

9 Je crois qu'il _____ (dormir) encore. Voulez-vous que je le réveille ?

10 Je ne pense pas qu'elle _____ (connaître) mon numéro de téléphone.

APPENDIX C5b Post-test B: French Subjunctive of doubt – Instructor's version

1	☑ Je doute qu'il ❑ Je sais qu'il	sache conduire.
2	❑ Je pense qu'elle ❑ Je ne suis pas sûr qu'elle	part demain.
3	❑ Je doute qu'il ❑ Je crois qu'il	fait les courses tous les jours
4	❑ Je pense qu'il ❑ Je ne suis pas sûr qu'il	va en France samedi.
5	❑ Je crois qu'il ☑ Je ne pense pas qu'il	aille à l'université.
6	❑ Je suis persuadée qu'elle ☑ Je ne pense pas qu'elle	choisisse un restaurant italien.
7	❑ Je doute qu'il ❑ Je crois qu'il	a beaucoup de courage.
8	☑ Je doute qu'elle ❑ Je crois qu'elle	puisse t'aider.
9	❑ Je pense qu'il ❑ Je ne crois pas qu'il	boit trop.
10	☑ Je ne crois pas qu'elle ❑ Je sais qu'elle	lise un livre tous les jours.
11	❑ Je sais qu'il ❑ Je doute qu 'il	fait beaucoup de natation.
12	❑ Je sais qu'elle ❑ Je ne pense pas que mon chien	peut courir très vite
13	☑ Je ne crois pas qu'il ❑ Je pense qu'il	ait de chat.
14	❑ Je crois qu'il ❑ Je doute qu'il	sort tous les soirs.
15	☑ Je ne crois pas qu'elle ❑ Je pense qu'elle	vienne demain.
16	☑ Je ne suis pas certain qu'elle ❑ Je sais qu'elle	fasse des crêpes.
17	☑ Je ne crois pas que mon chat ❑ Je pense qu'elle	puisse chanter.
18	❑ Je crois qu'elle ❑ Je doute qu'elle	prend l'avion à New York.
19	❑ Je crois qu'il ☑ Je doute qu'il	réussisse sa vie.
20	❑ Je pense qu'elle ❑ Je ne pense pas qu'elle	veut aller en Belgique cet été.

- **INTERPRETATION:** TRANSCRIPT & ANSWERS

SCORING FOR THE INTERPRETATION TASK:

Scoring for the interpretation task consists of 1 versus 0 point system per item for a total possible of 10 points. A subject will receive 1 point if the target sentence is assigned correctly subjunctive reference and will receive 0 point if the tense assignment is wrong.

- **PRODUCTION TASK**

The production task consists of 10 written items with blanks in which participants have to complete the sentence with the correct form of the verb in the subjunctive cued by an infinitive in parentheses.Of these sentences 5 are in the present tense (distractors) and 5 items are in the subjunctive. **Sentences in blue are in the subjunctive.**

1 Je crois que ma soeur _____ (venir) demain.

2 **Je ne pense pas qu'elle PRENNE (prendre) le train. Elle préfère l'avion.**

3 **Je doute que Louise PUISSE (pouvoir) aller avec moi en France. Elle travaille tout l'été.**

4 **Je doute que Paul BOIVE (boire) beaucoup ce soir car il conduit.**

5 Je pense qu'elle _____ (aller) à Paris en Eurostar. C'est moins cher.

6 Je pense que Pierre _____ (devoir) travailler un peu plus s'il veut réussir.

7 **Je ne suis pas certaine que cette robe SOIT (être) ton style. Je préfère la jupe.**

8 Je sais qu'il _____ (vouloir) toujours être le premier partout. Ça m'énerve !

9 Je crois qu'il _____ (dormir) encore. Voulez-vous que je le réveille ?

10 **Je ne pense pas qu'elle CONNAISSE(connaître) mon numéro de téléphone.**

SCORING FOR THE PRODUCTION TASK:

Scoring for the production task consists of a 2, 1, 0 point system for a possible total of 20 points. A participant will receive 2 points if the sentence completion contains a verb in the correct subjunctive form. If the verb is in the subjunctive but is the wrong person or if the verb is in the subjunctive but the participant has switched verb category endings, a score of 1 point will be allocated to the participant. Any other response will receive a score of 0 point

APPENDIX C6a Post-test C: *French Causative* - Student Version

POST-TEST C

NAME: _____ DATE: _____

1. You will hear 20 sentences. For each sentence you hear, answer the question that accompanies it. You have 5 seconds after hearing the sentence to answer the question. You only need to write someone's name to answer the question. You may also tick "I am not sure" if appropriate.

		I AM NOT SURE
1	Who watches the film?_____	❒
2	Who eats the soup ?_____	❒
3	Who takes the car ?_____	❒
4	Who does the dishes?_____	❒
5	Who does the housework ?_____	❒
6	Who watches the photos ? _____	❒
7	Who does the homework ?_____	❒
8	Who walks the dog ?_____	❒
9	Who is having a bath?_____	❒
10	Who does the cooking ?_____	❒
11	Who plays on the computer ?_____	❒
12	Who is eating?_____	❒
13	Who goes to the language centre ?_____	❒
14	Who brings the book back to the library ?_____	❒
15	Who does the ironing ?_____	❒
16	Who writes the letter ?_____	❒
17	Who draws ? _____	❒
18	Who washes the car ?_____	❒
19	Who drinks milk every morning ?_____	❒
20	Who eats the cake?	❒

2. **For each picture that is shown on the overhead, complete the sentence to describe it. You will have 10 seconds to complete each sentence.**

11. Charles fait _____

12. Jean fait _____

13. Marie fait _____

14. Pierre fait _____

15. Emma fait _____

16. Laura fait _____

17. Thomas fait _____

18. Gérard fait _____

19. Nathalie fait _____

20. Zoë fait _____

APPENDIX C6b Post-test C: *French Causative* – Instructor's Version

POST-TEST C

Participants have to listen to 20 sentences and then indicate who is performing the action by answering the questions or by ticking or "I am not sure" if they don't know. Of these sentences, 10 are ***not*** *using the causative (distractors) and 10 items are using the causative (target items).* **Sentences in blue are using the causative.**

- INTERPRETATION TASK: Transcript of the CD & Answers

			Answers
1	**Claire fait regarder le film à Charles.**	**Who watches the film?**	**Charles**
2	Mark mange la soupe d'Emma.	Who eats the soup ?	
3	Tom prend la voiture de Léo.	Who takes the car ?	
4	Louis fait la vaisselle de Sandra.	Who does the dishes?	
5	**Paul fait faire le ménage à Sophie.**	**Who does the housework ?**	**Sophie**
6	**Marie fait voir les photos à Louise.**	**Who watches the photos ?**	**Louis**
7	Bob fait les devoirs de Simon.	Who does the homework ?	
8	**Sarah fait promener le chien à Zoë.**	**Who walks the dog ?**	**Zoë**
9	**Je fais prendre un bain à Théo.**	**Who is having a bath?**	**Je (me)**
10	Nathalie fait la cuisine pour Juliette.	Who does the cooking ?	
11	Mark joue sur l'ordinateur de Laura.	Who plays on the computer ?	
12	**Charlotte fait manger Olivia.**	**Who is eating?**	**Olivia**
13	**Mon professeur nous fait aller au centre de langue une fois par semaine.**	**Who goes to the language centre?**	**Nous (us)**
14	**Charles me fait rendre un livre à la bibliothèque.**	**Who brings the book back to the library?**	**Me**
15	Il fait le repassage pour son père.	Who does the ironing ?	
16	**François fait écrire une lettre à Marie.**	**Who writes the letter ?**	**Marie**
17	Ma soeur fait un dessin pour mon père.	Who draws ?	
18	Caroline nettoie la voiture de Catherine.	Who washes the car ?	
19	**Mon père fait boire du lait à Théo chaque matin.**	**Who drinks milk every morning?**	**Théo**
20	Ma tante mange le gâteau de mon oncle.	Who eats the cake ?	

SCORING FOR THE INTERPRETATION TASK POST-TEST C:

Scoring for the interpretation task consists of 1 versus 0 point system per item for a total possible of 10 points. A participant will receive 1 point if the person performing the action is identified correctly (target sentence is assigned correctly causative reference) and will receive 0 point if the person performing the action is wrong or the participant indicates an inability to determine the tense.

- **PRODUCTION TASK**

The production task consists of 10 written items with blanks in which participants have to complete the sentence with a correct verb cued by an infinitive in parentheses. Sentences in blue are using the causative construction.

1. Charles fait la valise de Paul
2. Jean fait laver la voiture à Phillipe.
3. Marie fait promener le chien à Sophie
4. Pierre fait lire un livre à Louis.
5. Emma fait du ski avec Léa.
6. Laura fait faire la vaisselle à Juliette.
7. Thomas fait un cadeau à Marc.
8. Gérard fait fait acheter du lait à François.
9. Nathalie fait un gâteau pour Léo.
10. Zoë fait de l'alpinisme/l'escalade avec Simon.

SCORING FOR THE PRODUCTION TASK:

Scoring for the production task consists of a 2, 1, 0 point system for a possible total of 20 points. A participant will receive 2 points if the sentence completion contains a verb in the correct form using the causative. If the causative is used but the wrong person is used or if the participant has switched verb category endings, a score of 1 point will be allocated to the participant. Any other response will receive a score of 0 point.

APPENDIX D James Lee's 11 hypotheses

These Hypotheses are extracted from James Lee critical review of the research on Processing Instruction (Lee, 2004 in VanPatten).

Hypothesis 1. PI can help learners of any L2 apply appropriate word order processing strategies. (Lee, 2004:321)

Hypothesis 2. PI can help learners of any L2 perceive and use acoustic stress when it is a distinctive feature of the language. (Lee, 2004:321)

Hypothesis 3. PI can help learners of any L2 to process a formal feature of that language in order to determine an appropriate semantic interpretation of a sentence. (Lee, 2004:321)

Hypothesis 4. Evidence will be found to corroborate the long-term durative effects of PI on word-order, perceptual, and semantic processing strategies. (Lee, 2004:321)

Hypothesis 5. PI will be equally effective as an intervention for the establishing initial form-meaning connections as it is for improving learners' performance. (Lee, 2004:322)

Hypothesis 6. Some learners benefit more from PI than do others. (Lee, 2004:322)

Hypothesis 7. PI will be effective for instilling target-language specific processing strategies, no matter the L1 of the learners. (Lee, 2004:322)

Hypothesis 8. PI will yield significant improvement on discourse level interpretation tasks. (Lee, 2004:322)

Hypothesis 9. Learners who receive training on one type of processing strategy for one specific form will appropriately transfer the use of that strategy to other forms without further instruction in PI. (Lee, 2004:319)

Hypothesis 10. Learners who receive PI will develop better intuitions about the L2 than learners who receive other types of instruction. (Lee, 2004:320)

Hypothesis 11. The cumulative effects of PI will be greater than its isolated effects. (Lee, 2004:321)