DEGREES OF INSTRUCTIONAL EXPLICITNESS, DEPTH OF PROCESSING, LEARNING STYLES AND L2 DEVELOPMENT: A STUDY ON THE SPANISH IMPERFECT SUBJUNCTIVE

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The aim of the present study was three-fold: First, it intended to investigate the effects that different types of instruction varying in explicitness (e.g., Rosa & O’Neill, 1999; Rosa & Leow, 2004), had on 88 intermediate-level Spanish learners’ development of the Imperfect subjunctive. Second, it aimed to gain some insight into participants’ minds by employing think-aloud protocols to account for the internal processes that occurred while they carried out a dual task (i.e., reading for meaning and form), and to examine how these processes correlated with post-task performance. Finally, its third goal was to probe deeper into participants’ Learning styles (Dornyei, 2005), and, more specifically, into their preference for a deductive or inductive approach to learning grammar rules in the L2. According to their preference, a match or mismatch situation was created with learners matching the treatment received (deductive approach = More explicit condition) or mismatching it (deductive approach = Less explicit conditions) to account for the matched/mismatched design’s impact on post-task performance (Valtz, Tare, Jackson, & Doughty, 2013). Participants were semi-randomly assigned to one of six experimental conditions differing in explicitness and in whether they thought aloud or not to control for potential reactivity (Bowles, 2010) (+ Explicit +/- Think aloud (TA), - Explicit +/- TA, Baseline +/- TA). The study consisted of 3 sessions and it followed a pre/post/delayed test design with 2 weeks between each of the sessions. Results showed that the Less explicit condition appeared to perform as well as the More explicit condition immediately after treatment.
and better 2 weeks after treatment for both interpretation and production tests when compared to the Baseline condition performance. With regards to Depth of Processing, the More explicit condition seemed to elicit more instances of deep processing than the Less explicit or Baseline conditions, and deeper processing significantly correlated with higher comprehension and with a more accurate subsequent production of the target form. With respect to Learning styles, the mismatch condition did positively correlate with better performance at Interpretation immediately after treatment, unlike the matching condition, which failed to yield any positive correlation with post-task performance.
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Chapter 1 – INTRODUCTION

Statement of the Problem

It is generally assumed in the field of Second Language Acquisition (SLA) that different types of instruction may lead to different outcomes in learning (Norris & Ortega, 2000, Spada & Tomita, 2010), with some learners benefiting more from a specific instructional type than others. While one learner may find more useful a wholly detailed explanation of a grammar rule (more explicit), another may prefer an approach where, given the hint, he has to find out by himself how a certain grammar structure works (less explicit).

Many studies have investigated the dichotomy explicit/implicit instruction (see Norris & Ortega, 2000; Spada & Tomita, 2010, for a thorough review), and an area of increasing interest in the SLA literature has addressed the potential different effects between treatments differing in their degree of instructional explicitness (Benati, 2004; Erlam, 2003, 2005; Farley, 2004; Herron & Tomasello, 1992; Robinson, 1996; Rosa & O’Neill, 1999; Rosa & Leow, 2004; Shaffer, 1989; Stafford, Bowden, & Sanz, 2012; Tagarelli, Mota & Rebuschat, 2014; Sanz, Lin, Lado, Stafford, & Bowden, forthcoming). Findings from these studies are rather inconclusive, as different in design were the methodologies used to provide the types of instruction. Additionally, some of the studies’ treatments just differed on the type of instruction provided prior to practice (Herron & Tomasello, 1992; Rosa & O’Neill, 1999; Shaffer, 1989), while others included more or less explicit feedback\(^1\) as part of the design in addition to the types of instruction (Erlam, 2003; Rosa

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\(^1\) Li’s meta-analysis (2010) provided a very thorough description of studies including corrective feedback in their designs. Overall, she found that feedback had a positive effect on performance after treatment and over time, with a better maintenance over time for the implicit feedback. Since the goal of this study is to account for the effects of different instructional conditions prior to experimental task, and feedback has been observed to level the playing field when added, it will not be addressed in the present design.
Along this line, Sanz and Morgan-Short (2005) emphasized the essential role that type of practice plays when providing explicit information prior to or during practice. They refer to the overall positive effect that pedagogical interventions show for explicit L2 teaching, as indicated in Norris and Ortega (2000), but warn about the types of language development measurements employed in most studies, biased towards explicit knowledge, rather than implicit. More importantly, they suggested that when the practice learners engage in is task-essential (Loschky & Bley-Vroman, 1993), pre-practice explicit information by itself or combined with feedback, becomes redundant.

The manner in which the less explicit instructional condition was presented in empirical studies addressing types of instruction varied extensively, as well as the learning assessment measures or the target forms. Robinson (1996), Rosa and O’Neill (1999), and Tagarelli et al. (2014) asked participants to search for the rule. Shaffer (1989) instructed them to verbalize it. Herron and Tomasello (1992), on the other hand, provided participants with the target structure within sentences, but did not tell them that they had to look for a rule. Some studies (e.g., Erlam, 2003; Rosa and Leow, 2004; Sanz & Morgan-Short, 2004; Stafford et al., 2012; VanPatten & Oikkenon, 1996) included measures of both language interpretation and production. Other studies have examined this issue from a neurolinguistic perspective (Morgan-Short, Sanz, Steinhauer, & Ullman, 2010; Morgan-Short, Finger, Grey, & Ullman, 2012). Differences were also found in the number of forms targeted, with some studies targeting more than one form (Herron & Tomasello, 2002; Robinson, 1996; Shaffer, 1989), and in the pool of participants, as Erlam (2003) and Shaffer (1989) used high-school participants. With regards to the effects that these types of instruction had on performance, Herron and Tomasello (1992) and Tagarelli et al.
(2014) yielded an advantage for the less explicit instructional type; but Erlam (2003), Robinson (1996), and Rosa and Leow (2004) found the condition receiving explicit information to be more effective, the latter for new items. In contrast, Rosa and O’Neill (1999), Shaffer (1989), Sanz and Morgan-Short (2004), and Sanz et al. (forthcoming) did not find a significant difference when comparing both instructional approaches. Morgan-Short et al. (2010, 2012) found native-like processing mechanisms for the implicit condition after treatment and five months later.

Differences in the studies that employed measures of comprehension and production were also observed. Erlam (2003) observed a significant advantage for the more explicit condition at both comprehension and production tests; Rosa and Leow (2004) as well, especially at production with new exemplars. Sanz and Morgan-Short (2004), on the other hand, found that all groups, more and less explicit, significantly improved; and Stafford et al. (2012) did not find a significant difference at interpretation between the more and less explicit conditions, but it did find that a more explicit instruction combined with explicit feedback had a positive effect on productive abilities, but not explicit instruction by itself. This lack of consistence in findings and in the methodologies employed prevents us from making any strong conclusion with regards to the effectiveness of either treatment on participants’ performance.

Additionally, while most of these studies have looked at the “product” of the treatment; the “process”, what is going on in learners´ minds while carrying out the tasks, has been widely overlooked. The internal processes taking place in the learner´s mind while concurrently completing a specific task can shed some light at how deeply the target form(s) have been processed, and how that correlates to the actual results found in the study. Understanding this “depth of processing” was addressed in the field of cognitive psychology in the 70’s referred to as levels of processing (Craik & Lockhart, 1972; Craik & Tulving, 1975; Craik, 2002) but has
been more recently examined in the field of SLA (Hsieh, Moreno, & Leow, forthcoming; Hulstijn, 2001; Laufer & Hulstijn, 2001; Leow, Hsieh, & Moreno, 2008; Morgan-Short, Heil, Botero-Moriarty, & Ebert, 2012). However, while this “depth” has been categorized by the cognitive effort put into the task and by the noticing of a target item or items, it has not been examined under more or less explicit types of instruction. Further research is necessary to enable us to make stronger claims in relation to the processing of a specific form at a deeper or shallower level under a particular instructional type.

Another area that warrants further research within the field of SLA is that of Learning styles, which refer to the learner’s individual preferences for certain learning conditions (Skehan, 1989, 1991). Many SLA studies have focused on other individual differences such as aptitude, age, or gender, but the actual learners’ preferences have been largely ignored in the field. Sanz (2005) posited that the analysis of individual differences and internal processing mechanisms, and their interaction with external variables, i.e., type of input, are key to understand why some learners learn faster than others. Therefore, the interaction of an individual difference, like Learning styles, with an external variable, i.e., types of instruction, together with an examination of learners’ internal processes could shed a more complete picture of the L2 acquisitional process. Dornyei (2005) also suggested that knowing which instructional methods better match the participants’ approach to learning could promote overall learning effectiveness. In line with Dornyei’s statement, Vatz, Tare, Jackson, and Doughty (2013) suggested that more studies using a matched/mismatched design are necessary to shed light at how individual differences (i.e.,

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2 Within the construct of awareness, Rosa and O’Neill (1999) and Rosa and Leow (2004) examined how different instructional conditions correlated with different levels of awareness, and, in the case of Rosa and Leow, with the provision of +/- explicit feedback. A more detailed description of these studies is provided in chapter 2.
preferences for a certain learning style) can explain learning outcomes. Different models of Learning styles have been proposed to try to address learners’ preferences, increasing the number of areas covered with each additional model (Kolb, 1984; Reid, 1995; Ehrman & Leaver, 2003; Cohen, Oxford, & Chi, 2006). While some empirical studies have tested these models (e.g., Ellis, 1989; Peacock, 2001; Shen, 2010; Tight, 2010) yielding contradicting findings, it still remains to be seen how learning styles correlate with different instructional types and whether it renders a different performance at testing.

Taking all this into consideration, the aim of this study was to expose learners to two different types of instruction varying in their degree of explicitness, a more explicit and a less explicit instructional type, in order to observe their effectiveness in the development of the target form, the Spanish imperfect subjunctive. Besides, concurrent think-aloud protocols were utilized to gain some insight into learners´ minds to account for potential instances of processing at different levels. Finally, learning styles was also measured to understand which styles learners do actually engage in when it comes to learning a second language and to be able to establish a correlation between learners´ styles and their performance in the more explicit or less explicit condition.

**Definition of key terms**

**More Explicit type of instruction prior to practice:** This type of instruction moves from the general to the specific, and involves the provision of metalinguistic information (i.e., rule explanation) before students engage in language practice, being a more traditional type of instruction (Norris & Ortega, 2000).
Less Explicit type of instruction prior to practice: This type of instruction moves from the specific to the general, and the student might be presented first examples of the target form/structure without any prior rule explanation, or a hint indicating the type of form he is going to find in a task afterwards. From here, learners should arrive at metalinguistic generalizations on their own (Norris & Ortega, 2000).

Depth of Processing: The notion of Depth of Processing was originally proposed by Craik and Lockhart (1972) in the field of cognitive psychology to differentiate between deep and shallow processing, and it has been further investigated in that field (e.g., Craik & Tulving, 1975; Craik, 2002). In this study, it is used to refer to the mental or cognitive effort and amount of time spent employed while processing the L2 target item as revealed in concurrent think aloud protocols (Hsieh, Moreno, & Leow, forthcoming; Laufer & Hulstijn, 2001; Leow, Hsieh, & Moreno, 2008; Martínez, 2010; Morgan-Short, Heil, Botero-Moriarty, & Ebert, 2012).

Learning styles: Considered to be an Individual Difference (ID), Learning styles refer to “an individual’s natural, habitual and preferred way(s) of absorbing, processing, and retaining new information and skills” (Reid, 1995). Dornyei (2005) adds that they represent “a profile of the individual’s approach to learning, a blueprint of the habitual or preferred way the individual perceives, interacts with, and responds to the learning environment” (Dornyei, 2005, p. 121). From a pedagogical point of view, it is also an appealing concept, because, unlike other IDs like aptitude or abilities, they do not reflect an innate endowment that learners have, but rather the personal preferences they develop throughout time on how to approach learning. It is also suggested that a match between the type of instruction and a specific learning style could potentially benefit the L2 learner (Reid, 1995; Dornyei, 2005).
Introduction

The following sections present a review of studies on the different variables addressed in this dissertation: Types of instruction, Depth of processing and Learning styles. This review will motivate the research questions offered at the end of this chapter as well as the research design proposed in chapter 3.

Types of instruction

The type of formal instruction employed in the field of second language acquisition (SLA) has received considerable investigation over the last fifty years. While nowadays empirical studies still discuss which type of instruction (more or less explicit) better facilitates second language (L2) learning, the scope of research has evolved from a very different perspective found in the early work. It was first questioned whether formal instruction, or teaching of grammar rules, was necessary or beneficial at all for L2 learners. This was largely studied from a Universal Grammar (UG) approach to SLA, which compared L2 learning with the incidental process guiding L1 acquisition and advocated for a non-interventionist position (Schwartz, 1993; White, 1987, 1991). The process for both L1 and L2 acquisition involved the resetting of certain parameters, which were triggered by positive evidence (input), thus assigning instruction a non-existent or minimal role in the resetting process.

Similarly, Krashen’s (1982, 1985) Input Hypothesis, a part of Monitor theory, also rejected the benefit of traditional instruction - provided through grammar teaching, overt error correction, etc. - arguing that consciously learned language was different from, and, more importantly, did not interface with the unconsciously acquired language. Krashen pointed out
that only the latter type would be used by the L2 learner, stating very clearly that learned
language cannot become acquired language. The consciously learned knowledge would be
limited to rules that are easy and would only constitute a small part of our L2 knowledge, with
the rest (and main part) of our knowledge being the result of unconscious processes. While his
theory later received some criticism due to its lack of testability, it had a tremendous influence
on the instructional approach of many language teachers, who adopted a position of “input-
providers”, intervening only when it was strictly necessary (Doughty, 1998, 2003).

While the former theories did not consider instruction to play a significant role in SLA,
Long (1983) provided a concise revision and summary of the studies published on the issue of
instruction and SLA up to that point in time. Long concluded that “there is considerable evidence
to indicate that L2 instruction does make a difference” (p. 374) when compared to naturalistic
exposure, running contrary to UG and Krashen’s Monitor theory. Long’s article was the first to
thoroughly pinpoint the possible positive effects and benefits of instruction, and set a departing
point for forthcoming studies on the issue. Subsequent research by Long (1988) and Doughty
(1991) also supported arguments for beneficial effects of formal instruction. With the significant
effects of instruction becoming clearer in the field (Ellis, 1991; Spada, 1997), research interests
shifted from the possible necessity of instruction to which types of instruction are more effective
to foster second language learning in classroom and laboratory contexts (Norris & Ortega, 2000).

In the remainder of this section, I provide a review of the studies that have contributed
the most to the current state of knowledge on the effects of different types of instruction on L2
development, categorizing them into three different strands: 1) Explicit vs. Implicit types of
instruction; 2) types of instruction differing in their degree of explicitness; and 3) studies on
Processing Instruction. This is followed by an exploration of related issues and areas that still warrant future research in the field of SLA.

To date, two meta-analyses, Norris and Ortega (2000), and Spada and Tomita (2010) have synthesized the research on different types of instruction (explicit vs. implicit in their terms) and the differential effect these might have on the acquisition of an L2. Norris and Ortega identified type of instruction as more explicit if “rule explanation comprised part of the instruction” or less explicit if “learners were directly asked to attend to particular forms and to try to arrive at metalinguistic generalizations on their own” (2000, p. 437). On the other hand, an implicit type of exposure was characterized by the fact that “neither rule presentation nor directions to attend to particular forms were part of a treatment” (2000, p. 437). Spada and Tomita classified the instructional treatments as explicit or implicit following criteria in Norris and Ortega. They also divided the target form/structures addressed in the studies into simple or complex, following the categorization from Hulstijn and de Graaff (1994). Overall findings of the aforementioned meta-analyses revealed that using a more explicit type of instruction resulted in better overall performance than employing a more implicit type. This greater effect was observed for both simple and complex features and at both immediate and delayed tests (Spada & Tomita, 2010). However, when evaluating some of the results from individual studies, it is clear that although some of them find explicit exposure to lead to better outcomes (e.g., Doughty, 1991; Ellis, 1993; Alanen, 1995; DeKeyser, 1995, 1997; Robinson, 1996, 1997; de Graaff, 1997; Rosa & Leow, 2004; Fernández, 2008), not all studies have found such effects (e.g., VanPatten & Oikennon, 1996, Rosa & O’Neill, 1999; Benati, 2004; Sanz & Morgan-Short, 2004; Wong, 2004), and it is not yet clear why such differences in outcomes continue to be reported. What follows is a review of the studies that have investigated explicit vs. implicit types of instruction.


**Explicit vs. Implicit types of Instruction**

Doughty (1991) conducted a computer-assisted study comparing two experimental groups: rule-oriented learners, who were given explicit rules; meaning-oriented learners, who received enhanced and elaborated input; and a control group: learners who were only exposed to examples. The target structure was different types of relative clauses in English. Participants were 20 foreign students who were studying English at an intermediate level. Treatment lasted 10 days, and each day learners completed one session on a computer. Upon completion of each session, learners were tested on the content they had seen that day, and had to write a recall summary of the text they had been presented on each experimental or control condition. At posttest, tests followed those used for the pretest, but changing some lexical items in the examples and adding two more sections. Posttests were both written and oral. The main question of interest that the author sought to answer was whether instruction would have an effect on the acquisition of English relatives. Both experimental conditions performed significantly better than the control group in both production and comprehension posttests. However, it is important to note that the control group, with just mere exposure to the target structure, also improved significantly from pretest to posttest. Moreover, the meaning-oriented group outperformed the rule-oriented group on comprehension. This could be due to the fact that this group received extra elaboration on their input. Doughty concludes that being exposed to different types of instruction over a period of time enhances the acquisition of the English relative in contrast with just being exposed to the language. She adds that since both experimental conditions performed equally in the acquisition of the relative clause, visual saliency might have been a key issue in overriding the potential advantage of the metalinguistic explanation of the target structure. Doughty’s findings provide some validity for Long’s (1988, 1991) Focus on Form (FonF), which
draws learner’s attention to the target structure in a meaningful context. According to Long (1988), FonF would produce a faster rate of learning and attainment than instruction not following FonF.

Ellis (1993) also carried out a computer-assisted experiment where he examined the acquisition of rules for the Welsh “soft mutation”, a morpho-phonological phenomenon of initial consonants. Fifty-one participants were trained under one of three instructional conditions. The random group received exposure to many examples of consonant alternations in a random order; the grammar group received explicit information of the rules necessary to understand how the “soft mutation” works, followed by the same examples provided to the random group. The third condition, the structured group, received the same grammar explanation as the grammar group, followed by two different examples after each rule, and then by the examples provided to the other two conditions. More than 71,000 trials were analyzed. Learners in the random condition were the fastest in judging the grammaticality of old sentences, but failed to transfer this knowledge to the new items. The grammar condition also showed knowledge of the rules and a better ability to extrapolate it to the new items than the random condition, but still not very strongly. The structured condition, on the other hand, showed strong performance on both knowledge of the explicit rules and on generalizing this knowledge to the new items in the grammaticality judgment task. They were also able to explicitly formulate these rules. Ellis argued that the trend detected in the study was to be expected, given that the structured condition received the most explicit treatment in its explanation of the rules and its subsequent application to new examples.

Alanen (1995) examined the effect of explicit instruction and textual enhancement on learning semi-artificial Finnish locative suffixes and four types of consonant alternation.
Development was measured by two reading comprehension tasks, two short passages in Finnish, a subsequent production test, a 33-item sentence completion test, and a grammaticality judgment test. Thirty-six participants were assigned to one of three experimental groups: explicit rule presentation, textual enhancement by the use of italics, and a combination of both conditions; and a control group. All participants thought aloud during treatment. The combination of both conditions was expected to yield better performance, since it was the most explicit condition, followed by the explicit rule presentation, the enhancement group and the control group. On analyzing the results on production tasks, rule and rule-and-enhance conditions outperformed the other two: textual enhancement and control. However, no clear-cut differences between the first two emerged, and the textual enhancement group did not appear to outperform the control group either. A qualitative difference was, however, observed between these two groups, with the textual enhancement condition producing more incorrect suffixes due to a probable overgeneralization of the rule provided and the control group omitting most of them. A more detailed analysis of the think aloud protocols indicated that performance was influenced by the attention paid to the locative suffixes during treatment, irrespective of the experimental condition. It should be noted that the condition combining rule presentation and textual enhancement could be comparable to the structured input condition in Ellis (1993), making findings quite similar, as the most explicit condition in both studies led to better performance (cf. DeKeyser, 2003).

In another study on types of instruction, Robinson (1997) added an enhanced condition to the instructed, implicit and incidental conditions that he used in an earlier study. While in Robinson (1996), he included a rule-search condition, there was no rule-search condition in this study. Participants were 60 ESL native speakers of Japanese students. After being randomly
assigned to one of the experimental conditions, they were required to read 55 sentences that contained the target structure at the training phase. This structure was the dative alternation found with some English verbs (e.g., *give*). The enhancement condition was presented by means of a box where the target structure was inserted. After reading each sentence, participants were asked a question that differed according to the experimental condition. The answer *yes* or *no* had to be provided, which was followed by *correct* or *incorrect*. Participants in the implicit condition were requested to read and remember the position of words in sentences. The incidental and enhanced groups were instructed to read for meaning, while the instructed condition consisted of a metalinguistic explanation of the target rule. During the transfer session, 30 sentences were presented to all conditions in a fixed randomized order, 10 old grammatical sentences (seen in the training set), 10 new grammatical sentences, and 10 new ungrammatical sentences that followed the rule presented to the instructed condition (disyllabic verbs with double object construction). Participants had to judge whether the sentences were grammatical or ungrammatical. At the end of the study, they completed a debriefing questionnaire where the author intended to see whether they had noticed any rules, whether they had been looking for these rules, and whether they could explain the rules. Results showed no differences in performance on old grammatical sentences across conditions, but yielded higher accuracy on new grammatical items for instructed participants, which revealed that they were more able to generalize the training effects to new items. On the other hand, enhanced learners did not significantly outperform the incidental or the implicit conditions on new grammatical sentences, but did outperform the implicit learners on new ungrammatical sentences. Regarding results from the debriefing questionnaire, most incidental and enhanced learners could state the rule, whereas only a few implicit learners were able to do so. The enhancement condition also
facilitated noticing of the rule, in contrast with fewer instances in the implicit or incidental conditions. Robinson discussed these findings in relation to Long’s (1988, 1991) Focus on Form (FonF), which states that comprehensible input by itself is not sufficient to divert learners’ attention to certain morphosyntactic features. Robinson, like Doughty (1991), claimed that both instructed and enhanced learners benefited from FonF in that they were capable to transfer their understanding of the rules to novel items.

DeKeyser (1995) created a miniature linguistic system, Implexan, resembling a subject-verb-object (SVO) language with number and case marking on the noun and number and gender marking on the verb, which consisted of 98 words and 5 morphological rules. DeKeyser examined the hypotheses claimed in cognitive psychology that deductive/explicit learning would be more effective through a more explicit grammar rule presentation for easy rules (e.g., Reber, Kassin, Lewis, & Cantor, 1980), and that a more inductive/implicit learning by pairing pictures and sentences would be more adequate for more complex rules (e.g., MacWhinney, Leinbach, Taraban, & McDonald, 1989). Sixty-one participants were exposed to a set of 124 sentences combining the words and the rules that made reference to a person performing an action with an object. Each sentence had its corresponding digitized picture. Participants were randomly assigned to the implicit or the explicit condition. Due to the presentation of grammar for the explicit group and the additional time necessary for it, DeKeyser created two sub-conditions, an extra-time explicit group and a same time explicit group. With this sub-division, he would be able to observe whether time had an effect on the final results. Participants completed a judgment test during the learning sessions, responding yes or no to whether the sentence they saw matched the picture, and a final judgment and production tests. The judgment test consisted of 8 old sentences and 36 new ones. For the production test, participants saw a picture on the screen and
had to write down the Implexan sentence that described the situation. They also completed a metalinguistic test that asked them to state Implexan grammar rules. Results on the production test confirmed the first hypothesis. Learners in the explicit condition significantly outperformed participants in the implicit one in the categorical rules, both with and without allomorphy, but only for new words. Results indicated that for old words the instructional condition did not make a difference. For the second hypothesis, however, those in the implicit condition performed better than their explicit counterparts when it came to dealing with more complex rules. It is important to note that no statistical testing was conducted for that part of the analysis, which suggests caution interpreting these results.

Also using an artificial language, eXperanto, a modified version of the existing Esperanto, de Graaff (1997) investigated the effect of the presence or absence of explicit instruction on four L2 morphological (mor.) or syntactic (syn.) structures, two simple ones: the plural noun form (mor.) and the position of the negation forms (syn.); and two complex ones: the inflection of the imperative mode (mor.) and the position of the object (syn.). The criteria to categorize the target structure as simple or complex were adapted from Hulstijn and de Graaff (1994), who considered the number of grammatical concepts/steps that have to be taken in order to produce the correct form. Fifty-six participants followed a self-study computer-presented course on the language during 10 sessions of about 1.5 hours each, which consisted of short dialogues, its translation, vocabulary activities, form-meaning connections, and production activities. Treatment differed across conditions in the following way: participants in the explicit instructional condition received explanation on the target structures after the dialogues and the comprehension activities, as well as in the form of feedback at testing. On the other hand, participants in the implicit condition rehearsed some example sentences after the dialogues and
comprehension activities where the target structure was included but received no explanation in the feedback. Testing took place once halfway during treatment and twice after treatment. Testing materials included a 60-item judgment sentence task, a 60-item gap-filling task, a 30-item eXperanto-Dutch vocabulary translation task and a 45-item sentence judgment and correction task. Overall, explicit instruction was found to facilitate the L2 grammar acquisition when compared to the implicit instruction, as the explicit condition performed significantly higher in all test sessions and all four task types. Explicit instruction was also observed to be more effective when compared to the implicit group with complex than with simple syntactic structures. However, no significant difference arose with the morphological structures.

Recently, three neurolinguistic studies also investigated the effects of explicit and implicit instructional conditions on L2 language development from behavioral and neurolinguistic perspectives. In the first of these studies, Morgan-Short, Sanz, Steinhauer, & Ullman (2010), learners were exposed to an artificial language, Brocanto2, under explicit (grammar lesson) or implicit (immersion) training conditions. The linguistic target form was an aspect of inflectional morphology, gender agreement article-noun and noun-adjective. Different proficiency levels (low vs. high) were compared. Practice consisted of a computer-based board game where tokens corresponded to lexical items and the movement of these tokens created nominal phrases. A series of these phrases were presented aurally to learners and they had to discriminate between sentences that were grammatically correct or sentences that contained a gender agreement violation. Results revealed that the implicit and explicit groups showed significant gains for article-noun agreement when moving from a low to a high level of proficiency, but only the implicit group showed a significant improvement for noun-adjective agreement. Results from the ERP data would suggest that at a low level of proficiency the
processing of the article-noun or noun-adjective gender does not resemble the neurocognitive processes that take place in the L1 gender agreement. At a higher level of proficiency, however, these mechanisms would become more similar to the L1 processes, switching from declarative to procedural memory.

In a second study, Morgan-Short, Steinhauer, Sanz, and Ullman (2012), learners were trained on Brocanto2 agreement and word order employing the same methodology as in the previous study, and no differences were found between implicitly or explicitly trained participants for performance on a grammaticality judgment task, but the event-related potential results showed that the implicitly trained learners had more language-related activity than the explicit learners, for noun phrase gender agreement and also word order. Therefore, although no performance differences were found, there were neural differences for the implicit group. This suggests that there may be effects on processing between two instructional conditions that cannot be seen from behavioral outcome data alone.

Based on the latter studies, Morgan-Short, Finger, Grey, and Ullman (2012) examined whether learning of the said artificial language was retained after months (an average of five) of no exposure to the target language, looking at both behavioral and neural outcomes. The methodology was similar to the one employed in the two previous studies. Interestingly, and contradicting findings from previous studies that examined retention of knowledge, learners showed no decrease in proficiency during that delay, and this held for both explicit and implicit types of instructions. This finding indicated that the type of instruction learners were exposed to did not yield a differential effect on performance in the long-term. ERP data, on the other hand, showed a more native-like neural processing at retention than immediately after treatment, and it was also more prominent for the implicit group. This native-like processing observed for the
implicit group would be conserved despite the months without exposure to Brocanto2, as this same finding was reported at the end of training (Morgan-Short et al., 2010, 2012).

In an L3 acquisition context, and also using Brocanto2, Grey (2013) examined both neural and behavioral outcomes in balanced bilinguals under two different instructional conditions, which differed in the provision of metalinguistic information prior to task. Both groups received meaningful practice. She compared their performance to a group of control monolinguals that had been previously tested under the same conditions (Morgan-Short et al., 2012). Behavioral results yielded a non-significant difference at performance between the monolingual and bilingual conditions at practice or grammaticality judgment for the Instructed condition, which the author argued that could be due to instruction leveling the playing field for both groups. On the other hand, for the Uninstructed condition, monolinguals outperformed bilinguals. When examining the neural data, these revealed an early sign of processing for the Uninstructed monolingual group, but not for the rest of conditions. Differences in processing were more apparent at a lower level of proficiency rather than at a higher level, which could indicate that a neural shift is more prominent at the early stages of language learning. In line with Morgan-Short et al. (2010, 2012a, b), Grey suggested that the processing neural mechanisms observed from the ERP data could provide an alternative explanation for the results observed at post-task performance.

In a study comparing L3 and L2 acquisition by bilinguals and monolinguals, Cox (2013), using the Latin Project (Sanz, Stafford, & Bowden), compared the effectiveness of providing grammatical information prior to practice vs. not providing it contrasting monolinguals and bilinguals and younger adults (18-27 ys) with older adults (60+). She targeted the assignment of thematic roles to nouns in Latin. Participants engaged in task-essential practice and some of them
received pre-practice grammatical explanation. Language development was measured via Grammaticality judgment, Interpretation, Production tests, and Reaction times, and attentional control and language aptitude were also measured. Testing followed a pretest, posttest, delayed posttest design. Results showed that pre-practice grammar information seemed to have a positive effect on language development for total and old items at the immediate posttests, and for new items also two weeks after treatment. Bilinguals receiving grammar explanation outperformed the other groups for combined and for new items in the GJT immediate posttest and in the Production immediate and delayed posttests. This effect was not found for the Interpretation tasks. Cox argued that having had previous instructed language learning experience, or a higher language learning aptitude, as indicated by the MLAT, could explain these findings. However, she also reported that the bilinguals not receiving grammatical information were the only ones to improve from post to delayed posttest in production, although non-significantly. With regards to the aging factor, Cox found that the provision of a grammatical explanation was helpful for both age groups at the posttest, but it only revealed a significant advantage over the group not receiving grammatical explanation for the young adults. At the delayed posttest, this difference became non-significant. For the older adults, there was still a benefit for grammar explanation, but the author argued that since they improved their accuracy from immediate posttest to the delayed posttest two weeks later, they might have relied on implicit learning processes, which remain over time, unlike the younger participants. Cox suggested that providing grammar explanation prior to practice seems to be less disruptive for older participants than explicit information provided via metalinguistic feedback, which could affect negatively their processing of the new linguistic information.
More Explicit vs. Less explicit types of Instruction

The studies reviewed above compared explicit and implicit types of instruction. Other studies focused on instructional types differing in its degree of explicitness, and one of these was Shaffer (1989). In her study, Shaffer compared the effectiveness of a deductive versus an inductive approach on the acquisition of different L2 target structures, the equivalents of “to know” in French: “savoir” and “connaitre” and those of “to be” in Spanish: “ser” and “estar” at the beginner level. At the intermediate level, the imperfect tense and the subjunctive mood were the target structures in both Spanish and French. Participants were 319 high school students from 3 different schools. For Shaffer, the inductive approach consisted of focusing students’ attention on the structure being learned and requiring the students to verbalize the underlying pattern of the rule. Although no significant differences were found when comparing the different types of instruction, a trend was detected in favor of the inductive approach for the most complex grammar structures, which contradicts the idea that an inductive approach should not be used to explain difficult concepts (Hammerly, 1975). It is important to note that those students in the inductive group were asked to verbalize the underlying rule once they had figured it out, which the author suggests could help them. It is also important to note some flaws in Shaffer’s design. First, students were not randomly assigned to conditions, and their teachers chose which participant was assigned to which specific condition. An additional flaw observed relates to the uneven number of examples provided to the experimental conditions, with the inductive condition receiving 20 and the deductive just 6, which could have potentially altered the results and their subsequent interpretation.

Herron and Tomasello (1992) compared deductive and guided inductive teaching conditions with English L1 students having French as their L2. Unlike Shaffer’s study, where
participants had to explicitly state the rule at the end of her examples, participants at Herron and Tomasello’s study received oral examples first but were not asked to formulate the rule explicitly. The authors targeted a variety of French grammar structures chosen from the student’s grammar manual. They assigned each structure to either the Deduction or Guided Induction condition for one class section, and then that same structure was assigned to the other condition for the other class section. The rest of structures alternated between conditions/class sections, giving a total of 5 on each condition. For both conditions, the teaching procedure consisted of 2 parts: an oral practice drill; and a sentence on the blackboard that modeled how the target structure had to be used. While the guided induction condition presented the practice drill first and then the model on the blackboard, the deduction condition reversed this order. Participants completed a fill-in-the-blank test one day after the structure had been seen and a delayed test with the same format one week later, in order to account for retention effects. Results yielded an advantage for the guided induction method, with 9 of the 10 target structure forms learned better under this condition in the posttest, and 7 out of 10 in the delayed test. Herron and Tomasello argued that in previous studies where the deductive condition appeared to perform better, the inductive condition did not emphasize an active hypothesis testing formation on participants. They conclude that enhancing drills in a more meaningful context could actually explain the benefits observed for the guided induction condition in their study. One limitation to this study is that the teaching of one structure in both conditions was done by two different teachers, which could affect the reliability of the teaching procedure, lacking consistence.

Reber (1989, 1993), in the field of cognitive psychology, conducted a series of influential experiments to examine artificial grammar learning (AGL). Reber presented participants strings of letters under explicit (rule-search or rule-provided) or implicit (memorization) conditions.
After treatment, participants were asked to state whether old or new strings could be part of a rule system. Results showed that those in the implicit condition outperformed those in the explicit condition in learning the abstract rules for both old and new strings of letters. Some researchers were critical with Reber’s findings, arguing that memorization of the strings of letters could lead to a conscious rule system to correctly encode the new ones (Knowlton & Squire, 1994), reducing the explicit/implicit instructional effect. Despite these claims, Reber’s studies are still very influential in both the cognitive psychology and the SLA fields.

Robinson (1996) expanded on the aforementioned claims by investigating the effectiveness of more or less explicit instruction for grammatical forms of differing complexity. Participants were 104 English as a second language (ESL) learners. There were four different experimental conditions: an implicit condition, where participants were instructed to memorize different sentences where the target structure was present; a rule-search condition, where the rule had to be discovered; an incidental condition, where participants had to read for meaning and focus on content; and an instructed condition, where participants were provided instruction on the target structure. Target structures included a complex one: how to form pseudoclefts of location in English; and a simple one: sentences where adverbials of movement or location are fronted allow for a subject-verb inversion. Robinson relied on the judgment of L2 instructors to identify a structure as simple or complex. The tasks consisted of training and transfer phases for all conditions. For the training phase, all groups were presented the same example sentences in the same order on a computer screen. After this, 40 sentences were presented in a fixed random order, 20 of them including the simple structure and 20 the complex one. The instructions for each condition differed as explained above. Upon presentation of a sentence, participants in all groups had to respond to a question pressing a key for yes or for no, receiving feedback in the
form of correct or incorrect for all conditions except the rule-search one, since their questions were open-ended. The transfer phase consisted of a grammaticality judgment test with 20 grammatical sentences and 20 ungrammatical ones. Results indicated that those in the instructed condition outperformed all the other conditions on the simple form. With regards to the complex form, the instructed condition also outperformed the rule-search condition and the implicit learners did not outperform any of the other conditions. For speed of response, all conditions responded significantly faster and more accurately to the easy rule than to the complex rule.

Awareness of the rules was measured through a posttest questionnaire asking participants: “Can you say what the rules were?” Few subjects verbalized either of the rules, and no significant difference was found in the verbalization of the easy or the complex rule as a whole. However, a significant difference arose when comparing the instructed condition with all other conditions, with higher instances of verbalization of the easy rule, and, on the other hand, those in other conditions more able to verbalize the complex rule. When observing verbalization of both rules, the following order was found, with the instructed group presenting the highest number of instances: instructed > rule-search > incidental > implicit.

Rosa and O’Neill (1999) investigated the effect of explicit instruction on conditional sentences in Spanish. Their design included four experimental conditions resulting from the combination of +/- rule explanation and +/- rule search, and a control group. Sixty-seven participants were randomly assigned to each of the experimental conditions and exposed to the target structure through a problem-solving task (a puzzle), where they had to find the right match to form the right sentence. Performance was measured through a multiple-choice test administered right after the treatment. Think alouds were collected during treatment. All conditions significantly improved from pretest to posttest, but explicit instruction did not
outperform the other experimental conditions. The authors argued that when the input is combined with meaningful practice, explicit instruction does not seem to enhance language acquisition and that higher amounts of intake were correlated with higher levels of awareness. Additionally, awareness across conditions showed levels of understanding for the rule-search condition to be comparable to those receiving explicit instruction.

Rosa and Leow (2004) investigated whether a more explicit instruction affected learners’ ability to recognize and produce L2 Spanish past conditional sentences. Participants were 100 adult native speakers of English enrolled in advanced Spanish courses. The following variables were manipulated: +/- task-essentialness (Loschky & Bley-Vroman, 1993); +/- feedback (explicit/implicit); and a pre-task grammar lesson focusing on the target structure for the explicit instruction condition (+/- explicit grammar), creating 6 different experimental conditions. At treatment, participants had to complete a problem-solving task, where the past conditional sentences were presented in the form of a jigsaw puzzle. A total of 28 puzzles had to be solved and the participant had to find the right piece out of four possibilities provided to complete the puzzle. Three recognition tests were provided to participants at pretest, posttest, and at a delayed test. They consisted of 24 sentences and learners had to decide which option out of four best fitted the sentence. These were followed by three written controlled-production tests administered at the same stages of the experiment as the recognition tests. In these, participants were asked to complete the sentences providing the appropriate verb form. Results yielded an advantage for the explicit conditions in the production and recognition (at a lesser extent) of new exemplars, but not old exemplars, where all experimental conditions appeared to improve. Regarding effects for time, these seemed to hold better at the delayed posttest with the provision of task-essential practice. In line with DeKeyser (1995) and Robinson (1997), the authors
suggested that satisfactory performance with old exemplars might be due to memorization rather than to the ability to expand the acquired knowledge to new items, whereas such expansion to new items is actually possible when explicit grammar instruction is provided. It is important to note that practice consisted of only 18 exemplars, which may have not been a high enough number for the less explicit conditions to figure out the rule.

Erlam (2003) compared the effectiveness of deductive and inductive instructional treatments in the acquisition of direct object pronouns in French as the L2. Language comprehension and production were the dependent variables in her study. Participants were high school students finishing their second year of French (intermediate level). All groups received a similar amount of instruction, three classes of 45 minutes each spread over the course of one week from the same instructor. Participants in the Deductive Instruction group were first given an exercise to make sure they could identify a direct object noun. Then, they were explained how it was replaced by a pronoun, being provided examples. After that, they were presented all direct object pronouns in French. This was followed by some practice where they had to replace the direct object nouns with the correct pronoun and to produce direct object pronouns too. The instructor provided feedback that made reference to the morphological and syntactical aspects of direct object pronouns and their use. Participants in the Inductive Instruction group, on the other hand, did not receive any type of rule explanation or explicit metalinguistic information related to direct object pronouns. They were first presented some pictures and had to pick out of two written statements the one that better matched the picture. They were also presented the statements aurally. In both cases, participants were encouraged to explain the reason why they had selected a particular option, leading to a discussion of the meaning of that particular form. During the error identification exercises, they were also encouraged to come up with reasons that
could explain why a pronoun in particular was correct or incorrect. However, they did not receive any feedback and were not told whether their judgment was correct or not. Participants in the control group received a regular lesson in three different classes but were not told there was a target form. Testing consisted of a pretest, a posttest and a delayed test six weeks after treatment and encompassed oral and written production, listening and reading comprehension tests. Results showed that participants in the Deductive Instruction condition made overall greater gains in both comprehension and production tasks than the Control group, but this was not observed for the Inductive Instruction condition. However, Erlam notes that despite the superiority in performance for the Deductive group, this did not seem to hold across time, with a very moderate effect size in the delayed test. The author also suggests that the Inductive group performed better for measures of language production focusing on the morphological rather than the syntactical features of the direct object pronoun. Erlam argued, following Norris and Ortega (2000) that there seems to be a very close relationship between the effectiveness of different types of L2 instruction and the testing instruments used, highlighting the importance of employing the right instruments.

In a follow-up study also targeting direct object pronouns in L2 French, Erlam (2005) compared the effectiveness of three different experimental conditions: a Deductive Instructional condition, an Inductive Instructional condition, and a Structured Input instructional condition. Erlam also investigated its relationship with language aptitude in order to account for individual differences and not just overall group gains. Measures of language aptitude included language analytic ability, phonemic coding ability, and working memory. 60 high school students were randomly assigned to the three experimental conditions. The design of the study followed that in Erlam (2003). The new condition added, the Structured Input condition, was based on
descriptions of Processing Instruction, as observed in VanPatten (1996) and VanPatten and Cadierno (1993). After receiving explicit information and rule presentation about the target forms, they were presented input-based activities as well as consciousness-raising activities in order to identify errors in spoken and written input. No activities involving production of the target form were presented to them. Same tests were provided as in Erlam (2003). Results showed that the Deductive Instructional condition performed better than the Inductive and the SI conditions, with participants appearing to benefit from an explicit rule presentation. On the other hand, no correlation was found between participants’ individual gains and differences in language aptitude for the deductive condition. Erlam suggests that being exposed to a more explicit treatment can help level out the potential differences in aptitude among participants.

With regards to the inductive condition, those participants who scored higher at analytical ability seemed to obtain higher gains at this condition at the delayed-posttest. This finding would support Robinson (1997), and would entail that more talented students can cope better with material presented in a less traditional way, following Skehan (1989). The SI condition benefited participants with a higher analytical ability in the production of direct objects pronouns in written form. Considering SI did not involve any production activities, participants with a higher ability were able to understand the structural pattern of the target form and to correctly apply it in production.

Very recently, two studies have examined the role that an individual difference, working memory capacity (WMC), plays in L2 development under different learning conditions. Tagarelli et al. (2014) compared an incidental and an intentional learning condition with a control condition exposing English native speakers (n= 70) to a semi-artificial language. All conditions listened to 120 grammatical sentences, differing in their degree of plausibility, with
different verb-order rules. The treatment for the experimental conditions differed in that while the incidental group was instructed to repeat each sentence after a prompt and to judge their plausibility, the intentional condition was indicated to search for the rules that motivated the sentences word order. Participants completed a grammaticality judgment test (GJT) consisting of 60 sentences, half of them grammatical and half ungrammatical. In order to measure WMC, participants also completed an operation-word span task and a letter-number ordering task. Performance on the GJT showed that the intentional condition outperformed the incidental group, and that both experimental groups outperformed the control condition. WMC appeared to yield a positive correlation for both tasks and performance on grammatical items, but only for the intentional condition. This suggested that WMC may predict performance on the GJT but only with explicit conditions. A delayed test was not included in their design, which prevented the authors from observing whether the positive correlation between WMC and accurate performance on the GJT held over time, and whether participants in the intentional condition still outperformed those in the incidental group.

Sanz et al. (forthcoming) investigated in two different experiments (n= 44) how WMC mediated in L2 language development under two pedagogical conditions that differed in the provision of a pre-practice grammar lesson. Both conditions were exposed to input-based practice and received explicit feedback. Based on the Latin project framework, the target item was the assignment of semantic functions in noun phrases in Latin. Participants completed a series of six input-based tasks, three of them providing written input and three aural input, where they had to select the correct answer out of two options. Testing consisted of three different types for experiment 1: Written and aural interpretation, and written GJT, and they were administered following a pre-, post- and delayed design. Experiment 2 added a production test and followed
the same test design. A listening span test was employed to measure WMC. Results for experiment 1, which provided the grammar lesson, showed a main effect for time for all three tests and that learning was maintained two weeks after treatment. Correlation analyses between test scores and composite WM scores did not reveal any significant relationship. With respect to experiment 2, a main effect for time was again found for all tests but the GJT, and this learning was maintained two weeks after treatment. This finding indicated that an input-based task-essential practice combined with explicit feedback was sufficient to promote language development, as observed in the significant improvement to interpret and produce the target form. Significant positive correlations between WMC and language development were found for the aural and written interpretation tests. The authors concluded that WMC seemed to correlate with performance when no metalinguistic information was provided. However, when this metalinguistic information was included prior to practice, WMC did not predict language development.

With respect to how the type of task and performance can interact, Revesz and Brunfaut (2013) investigated the effect that a series of task-related characteristics had on learners’ comprehension of a listening passage. The factors inherent to a task that were analyzed included linguistic, lexical, and syntactic complexity, and explicitness. Revesz and Brunfaut mentioned that most research had focused on the effects of the type of task on productive skills, such as speaking or writing, but not so much on receptive skills, like reading or, more specifically, listening. The researchers compared learners’ performance with their perceptions as expressed via perception questionnaires. They also employed a stimulated recall methodology to account for those aspects that learners had considered more difficult. Results showed that, for the most part, a higher linguistic and lexical complexity were associated with an increasing cognitive
demand on participants. This trend, however, was not observed for syntactic complexity or explicitness, as analyses failed to yield an association between this type of complexity and a greater cognitive demand. A strong relationship was found between task difficulty and learners’ perception of task difficulty and how accurately they felt they had completed the task. Surprisingly, these impressions were not in line with the actual results. The authors argued that the difficulty of the task and the perceptions of this difficulty did not necessarily overlap. Another plausible line of argumentation suggested that learners might have allocated more processing effort to cognitive demanding aspects of the text, leaving little room to process other aspects of the task. On the other hand, stimulated recall data correlated more strongly with the listening comprehension results. The authors urged researchers to keep in mind the characteristics of the task when interpreting learners’ comprehension of a passage.

As seen in the reviewed studies, there seems to be an advantage for explicit instruction when it is compared to conditions without such instruction. However, it is difficult to make a direct comparison among studies due to the differences in research designs. For instance, Ellis (1993) and Robinson (1996, 1997) based their interpretation of results on recognition tests, but they did not engage learners on production tasks. It remains unanswered whether their learners were able to correctly produce the target forms they had been exposed to beyond simple recognition. Some studies added an enhancement condition (Alanen, 1995; Robinson, 1997), with no clear advantage observed for this condition. Also, the traditional explicit/implicit categories are not obviously dichotomous in some of the designs, namely, the degrees of explicitness, for example the – instruction + rule-search condition in Robinson (1996) and Rosa and O’Neill (1999) or, as DeKeyser (2003) calls it, “explicit induction” (p. 324). Other studies comparing degrees of explicitness also shed different findings. Shaffer (1989) seemed to find a
trend in favor of the guided induction condition, and Herron and Tomasello (1992) also yielded an advantage for the Inductive condition for most of the target forms on both posttest and delayed test. Erlam (2003, 2005), on the other hand, found an advantage for participants in the most explicit condition, although Erlam (2003) pointed out that this advantage did not seem to hold well on the delayed test 6 weeks later. Tagarelli et al (2014) found an advantage for their intentional “rule-search” condition, which outperformed the incidental condition; and Sanz et al. (forthcoming) found that task-essential practice with explicit feedback promoted language development, cancelling the explicit grammar effects. Feedback was also manipulated differently across studies when combined with explicit instruction, rendering positive effects (e.g., de Graaff, 1997; Rosa & Leow, 2004). Additionally, target forms differed in saliency and in the number of forms targeted (DeKeyser, 1995; Robinson, 1996, 1997) as well as in the language used (English, Finnish, Spanish, artificial languages). Most of the studies may have also suffered from an explicit bias of the testing instruments employed, since most of them implemented discrete-point or declarative knowledge-based measures instead of more spontaneous and contextualized meaningful knowledge (cf. Doughty, 2003). Finally, there is, to date, still very little research on how degrees of explicitness in instruction may correlate with learners’ processing of the target forms, and how they can subsequently affect their L2 development (Alanen, 1995; Morgan-Short, Sanz, et al., 2010; Morgan-Short, Steinhauer, et al., 2012; Rosa & O’Neill, 1999), which warrants further exploration.

Processing Instruction

Some researchers have in fact considered whether instructional treatments can alter learners’ processing and improve L2 outcomes. In the 1990s, a new strand of research on
Processing Instruction (VanPatten, 1996, 2002, 2004) sought to determine whether processing strategies could be altered to improve L2 development. Briefly, the goal of Processing Instruction (PI) is to alter incorrect processing strategies in favor of other, more effective strategies. PI consists of two basic parts: (1a) provision of explicit instruction and (1b) warning learners of a potentially wrong strategy, and (2) exposing learners to Structured Input (SI) activities, a modified input that intends to “reorganize” learners’ strategies to make them more successful.

VanPatten and Cadierno (1993)’s study attempted to investigate whether PI was more successful than traditional instruction in a classroom setting on the acquisition of word order in Spanish. Intact classes were either assigned to one of the three experimental conditions: Traditional instruction, PI, or No instruction (control), with a final pool of 80 participants. Tests consisted of sentence-level interpretation and sentence-level written production tasks. Results indicated higher overall gains for the PI condition, but still a significant gain for the EI group on production, although not on interpretation. As EI is an inherent part of PI, the authors acknowledged the potential effect that EI could have on PI performance, limiting the generalizability of their findings. VanPatten and Sanz (1995) looked to expand on these findings by focusing on the supra-sentential level. They also observed benefits for PI when compared to the control group, since there was no EI condition in this study. These benefits were accounted for both written and oral tasks. The only exception was an oral video narration task, where no benefits were observed for PI. The authors argued that this could be due to the characteristics of the task, as it demanded a higher cognitive effort from participants.

In a replication of VanPatten and Cadierno (1993), VanPatten and Oikkenon (1996) investigated the learning of word order in Spanish (Object-Verb-Subject, OVS sentences) with
clitic pronouns. As PI is a combination of explicit instruction (EI) and structured input (SI), the latter one considered less explicit than EI, the authors separated both and considered them as independent variables. In doing so, they were trying to infer which one of the two had a higher effectiveness on learning the right OVS order and shed some more light to VanPatten and Cadierno’s findings. The SI condition also received implicit feedback and the authors added a third experimental condition, a PI group that received both SI and EI, and feedback. Fifty-nine participants were randomly assigned to the different conditions. In the interpretation test, SI and PI conditions made more gains than the EI group. In the production task, the PI condition significantly outperformed SI and EI. SI made more gains again than EI, but the difference failed to reach significance. VanPatten and Oikkenon interpreted these findings arguing that SI in itself produces higher gains than EI, suggesting that the use of EI within PI is unnecessary. However, it should be noted that in their design both SI and PI conditions received feedback, while EI did not. Even if learners in SI were not explained the rules, receiving yes/no feedback could have facilitated their figuring out the pattern. Therefore, it is not clear whether the effect could be attributed in its entirety to the SI condition since potential feedback effects cannot be teased out from the design. The implicit characteristic of the SI condition could actually be interpreted as less explicit than EI or PI, but explicit after all.

VanPatten and Oikkenon’s (1996) study was replicated by Benati (2004), Wong (2004) and Farley (2004) with contrasting results. Benati (2004), targeting the third-person future forms in Italian, found that all three groups, EI, SI, and PI made gains in both recognition and production tasks. However, SI performed better than EI in both tests, indicating that SI by itself might be sufficient to acquire the form in question. Wong (2004) targeted the forms de/d’ in French negative constructions, which are usually skipped by the learner as they do not contribute
any meaning and thus are redundant and have lower saliency. All groups improved in both recognition and production tests, with PI and SI groups performing better than EI and control. For production, however, SI performance was not different from EI. While Wong concluded that SI was sufficient for improvement and EI played no important role, her findings do not support such a clear-cut interpretation and call for caution, with EI making gains in both tests. Finally, Farley (2004) investigated the effect of EI in the acquisition of the Spanish subjunctive. Unlike the previous studies, only two experimental conditions, PI and SI were included. Both PI and SI improved in both test modalities, recognition and production, but PI did better than SI in both of them. Farley argued that the nature of the target form, indicating mood, which is less salient than word order or tense, might make the presence of EI more useful for learners.

Sanz and Morgan-Short (2004), following again a PI treatment, investigated the effects of +/-EI and +/- explicit feedback (EF) in the Spanish OVS order in a computer-assisted design. The Spanish target structure in question was the pre-verbal direct object pronoun. The authors intended to examine the isolated effects of explicit rules presented before and during practice. The study had four experimental conditions: +EI + EF, SI (-EI) + EF, +EI – EF, SI (-EI) – EF, and 69 first and second-year students of Spanish were tested. Participants in the +EI conditions were exposed to the explicit lesson before completing the tests, while those in the SI groups were exposed to 56 practice items of different types. Types ranged from matching the written or oral sentence presented with the right picture on the screen to decoding written input at the text level. The explicit lesson consisted of explicit grammar instruction and an explanation of how to apply the right strategy. Following VanPatten and Cadierno (1993), participants completed an interpretation test of 15 sentences and two production tests, a sentence-completion task, and a written video retelling. Results indicated significant improvement for all conditions, but no
significant difference across groups. Therefore, the amount of EI and +EF some participants were presented with did not turn out to be more beneficial than the SI –EF condition. However, the –EF groups still received implicit feedback in the form of right/wrong, which could create a potential confound when interpreting their findings.

More recently, Fernández (2008) investigated the effects of EI on the acquisition of two Spanish target forms: the object-verb-subject (OVS) word order and the Spanish present subjunctive. Participants in this experiment were exposed to a series of trials on a computer for both target structures, receiving feedback after each response. The main difference in the design was that while one group completed both PI steps, the other group was only exposed to SI; no EI and no warning about a potentially incorrect processing strategy. Learning was measured by trials-to-criterion (the number of attempts it takes to start processing the input correctly). For OVS word order, no significant difference was found between conditions. However, for the subjunctive form, the PI group started processing it faster than the group receiving only SI, which also showed gains. This finding, according to the author, might be due to the role of the explicit instruction in PI in speeding up the acquisition process. Fernández suggests, similarly to Farley (2004), that the difference in results supports that explicit instruction, within PI framework, might show benefits for target forms that are more complex or less salient, like the subjunctive; but not for other more transparent forms, like word order.

Henry, Culman, and VanPatten (2009) conducted a partial replication of Fernández (2008), targeting the nominative and accusative case marking on articles in L2 German sentences. These were presented, following Fernández’s study, in SVO or OVS word order. Unlike findings in Fernández, Henry et al. found that participants receiving EI in addition to SI outperformed those that only received SI. The authors argued that this contrast in results could be
explained in terms of the morphological complexity when comparing the target forms in German and in Spanish. They claimed that the unfamiliarity of the nominative and accusative cases for participants made the presence of EI more useful.

Wong (2009), in an attempt to corroborate Farley (2004) and Fernandez’s (2008) findings, investigated the learning of the subjunctive in French. She compared a PI condition that included both EI and SI, with two other conditions that just presented EI or SI. Assessment instruments included Interpretation and Comprehension tests. For the interpretation scores, the three conditions outperformed a control condition. However, for production results, only the two conditions that presented metalinguistic information, PI and EI, outperformed the control group, unlike the SI condition. The researcher argued that the presence of EI might be beneficial to learn a complex form like the subjunctive.

Morgan-Short and Bowden (2006) added a meaningful output-based instruction condition to compare its effectiveness with the input-based type. Participants were 45 beginning Spanish students who were randomly assigned to input-based, output-based or control groups. The study followed a pretest, posttest and delayed posttest design and the target forms were the Spanish preverbal direct object pronouns, measured by interpretation and production tests. Treatment between conditions differed in the mode of practice provided. In the PI condition, direct object pronouns had to be interpreted but there was no practice activity requiring the production of the target form. In the output-based condition, on the other hand, PI activities were modified in order to promote production of the target form. Results showed that both experimental conditions led to significant gains between pretest and delayed posttest when compared to the control group, but with PI showing more stable gains between posttest and delayed test than the output-based instruction. With regards to test type, both conditions performed similarly on the interpretation
test, and the output-based condition outperformed the input-based one on production at posttest, but not at delayed posttest.

Stafford, Bowden, and Sanz (2012) compared the effectiveness of four instructional treatments, varying in their degree of instructional explicitness, in the learning of Latin. Participants included Spanish heritage speakers and early and late Spanish-English bilinguals who differed in their degree of proficiency in English. The target form of the study was the assignment of the thematic agent/patient roles to nouns at the sentence level in Latin and they were exposed to the treatment through a computer program. Two of the treatments included pre-practice grammar about the assignment of thematic roles by means of morphosyntactic cues and the other two did not; and two of them received more explicit feedback whereas the other two received less explicit feedback. Findings suggested that treatments providing meaningful practice and less explicit feedback were sufficient to produce improvement at the interpretation level. However, in order to improve at the production level, more explicit feedback was necessary. Pre-practice grammar was only effective when accompanied by more explicit feedback. The authors argue that Explicit Information by itself does not seem to have a significant role in learning if meaningful practice is accompanied with some type of feedback.

With regards to PI long-term effects, VanPatten and Fernández (2004) conducted a conceptual replication of VanPatten and Cadierno (1993). The aim of that replication was to observe how PI effects held over time. Following the design in VanPatten and Cadierno, participants were instructed on clitic pronouns and on OVS sentences, and treatment consisted of EI and SI. Findings yielded that, eight months after treatment, participants still performed better than they did at the pretest. In light of these findings, the authors argued in favor of employing PI as learning is maintained over a long period of time. One potential critique to this replication is
the absence of a control group, which the authors argued it was due to the lack of a larger sample size.

As seen above, most PI studies, unlike the studies reviewed in the first part of this paper that found clear effects for explicit instruction, found either an advantage for SI or that SI performed at least as well as the explicit treatment in question. One plausible explanation is that structured input activities are a form of task-essential practice (Sanz & Morgan-Short, 2004, cf. Rosa & Leow, 2004; Rosa & O’Neill, 1999), and this provides learners with the opportunity to pay more attention to target items in the input in a meaningful manner, instead of just being merely exposed to it. However, we should recall that learners in VanPatten and Oikkenon (1996), and subsequent replications (Benati, 2004; Farley, 2004; Wong, 2004), were given yes/no feedback during treatment, which could be a confounding effect when it comes to interpreting the validity of their findings since participants might have ‘picked up’ information from the feedback. This effect would also apply to the –EF condition in Sanz and Morgan-Short (2004). With the exception of VanPatten and Cadierno (1993), Farley (2004) and Fernández (2008), SI was teased out from PI in order to examine the actual role that EI and SI as instructional treatments play. Most of these studies (Fernández, 2008; Sanz & Morgan-Short, 2004; VanPatten & Oikkenon, 1996) had the same target language (Spanish) and form (word order). However, recall that Fernández (2008) also targeted the subjunctive, and the PI group needed less trials than the SI group to start processing it correctly. Interestingly enough for the purposes of the present study, Farley (2004) and Wong’s (2009) findings, who also had the subjunctive as the target form, corroborated Fernández (2008). PI outperformed SI in both recognition and production tests. It is also important to note that in these two studies EI and PI could not be interpreted separately.
One reason to explain this difference in results could be the different characteristics of the subjunctive form and word order, with the former being less salient and transparent for learners of Spanish. Other target forms such as the Italian future tense in Benati (2004) or the negative particle *de/d’* in French in Wong (2004) yielded beneficial effects for SI. To conclude, although explicit information in these studies did not always yield more positive outcomes than the less explicit alternative, the explicit instruction still seemed to be beneficial. Finally, it is important to consider that although Processing Instruction aims to change learners’ processing behavior, it remains to be established what the processing behavior might be, especially for more or less explicit instruction.

Summary

The review of the most relevant literature on types of instruction summarized above indicates that explicit instruction appears to be beneficial to L2 development. As noted by DeKeyser (2003), all laboratory studies that directly compared implicit and explicit instructional conditions showed an advantage for the explicit condition, but other less explicit conditions, like the explicit inductive rule-search in Robinson (1996) and Rosa and O’Neill (1999) also showed gains. What remains unclear is why more explicit instruction may lead to more robust gains than less explicit types of instruction. In other words, what relationship might explicit instruction have on learners’ processing that in turn could positively affect outcome measures?

One way to address this question would be to gain some insight into participants’ minds while concurrently participating in the experimental treatment. Having the possibility of observing what they think while being exposed to a specific treatment could determine the level or depth at which they are processing the new input and whether it is differences in levels of
processing that might explain different outcomes for instructional treatments. A feasible way to gain this insight is by using concurrent think-aloud protocols. These protocols were used in Alanen (1995), Rosa and O’Neill (1999) and Rosa and Leow (2004) to account for levels of awareness, as described in Leow (1997, 1998). Alanen found that all learners benefited in one way or another from the different treatments. She noticed as well an overgeneralization of the rule by the rule + textual enhancement condition, probably due to the examples given during the explicit instruction. Rosa and O’Neill (1999) detected that higher levels of awareness corresponded to higher intake and also observed that levels of understanding (the highest possible level) for the rule-search condition, a less explicit type of instruction (Norris & Ortega, 2000, DeKeyser, 2003) were comparable to those found for the most explicit condition. The authors additionally suggested that the provision of task-essential practice could actually help learners in the rule-search condition increase their awareness of the target form in spite of not receiving prior explicit instruction. Therefore, an analysis of concurrent verbal protocols in both studies revealed additional information that helped us better understand the observed outcome as measured via offline testing. To date, however, no study has investigated how different types of instruction may be related to depth of processing, which is important to understand the differences in outcomes that have often been reported (Leow, 2012).

**Depth of Processing**

**Differences between the constructs of Awareness and Depth of processing**

Within the field of SLA, a special emphasis on the investigation of attention and awareness emerged in the 1990’s, rendering several theoretical postulations of attention (Robinson, 1995; Schmidt, 1990, 1993, 2001; Tomlin & Villa, 1994). These models posited that
a certain degree of attention is necessary for L2 learning. While this idea is commonly accepted among researchers in the field, the role that awareness played in that learning was more controversial (Tomlin and Villa versus Schmidt and Robinson). More specifically, Schmidt (1990, 1993, 2001) formulated his noticing hypothesis, which partially contradicted Tomlin and Villa’s model in relation to the role of awareness at the intake stage. According to this hypothesis, awareness is necessary for noticing, which, he claims, is “the necessary and sufficient condition for the conversion of input into intake” (1993, p. 209). In addition to this component, he identified one more level: understanding, which he defined as the ability to more deeply analyze the new L2 form/structure or to provide an accurate metalinguistic comment about it. Different studies have tested and provided empirical support for Schmidt’s hypothesis and levels employing verbal protocols to elicit learners’ instances of awareness (e.g. Leow, 1997, 2001; Rosa & O’Neill, 1999; Rosa & Leow, 2004). Three potential levels of awareness were reported (Leow, 1997)

Level of noticing: + cognitive change, - meta-awareness, - morphological rule

Level of reporting: + cognitive change, + meta-awareness, - morphological rule

Level of understanding: + cognitive change, + meta-awareness, + morphological rule

Overall, these studies showed that higher levels of awareness were directly correlated to a more accurate recognition or production of the target form, yielding significantly higher accuracy at performance.

It is important to note the importance of accuracy in order to understand how a protocol is coded at one level of awareness or another. To achieve a level of understanding, the learner must verbalize the morphological rule related to the target form/structure accurately.
Depth of processing (e.g., Calderon, 2014; Leow, 2012; Leow et al., 2008; Morgan-Short et al., 2012), on the other hand, focuses on participants’ amount of cognitive effort and time spent processing the target item, rather than on accuracy. In other words, what Depth of processing measures is how deeply the L2 learner engages in processing the new information, even if he has not arrived at a necessarily accurate conclusion in relation to the underlying grammatical rule. Therefore, while criteria to identify a low level of awareness (noticing) will be quite similar to those employed to identify a low level of processing, these criteria will become increasingly different as higher levels of awareness and deeper levels of processing are reported. An accurate description of the target form/structure is not strictly necessary to reach a deep level of processing. Put another way in relation to level of awareness, one may process a target item at a high level of processing but has not necessarily achieved an accurate understanding of said rule. On the other hand, awareness at the level of understanding subsumes a high level of processing that has achieved a full or partial understanding of the target underlying rule.

**Depth of Processing in Cognitive Psychology**

In the previous section, the most pertinent literature within the area of types of instruction in SLA was critically reviewed. Additionally, an area in need of further investigation was identified, Depth of Processing, so that stronger claims can be made regarding the effects of types of instruction on the second language learning process. Depth of processing, terminology coined by Craik and Lockhart (1972) in the field of cognitive psychology, refers to the idea that rather than memory stores, we attend to and process information in a continuum. This continuum ranges from shallow sensory analyses to deeper analyses concerned with meaning and implication. Craik and Lockhart (1972) also argued that deeper levels of processing were
associated to a longer-lasting effect of the acquired item in memory. This scheme could apply to verbal materials, such as phonological analyses, word identification or sentence comprehension. Processing the meaning of a new lexical item would take place at a deeper level than processing its phonological form, which would occur at a more shallow level. Craik and Tulving (1975) further explored these notions in a series of experiments. Participants were presented words and were asked questions varying in their degree of complexity. Positive responses indicated the depth of processing of a participant with regards to a specific word. They found empirical evidence for the effects of levels of processing, with deeper processing leading to greater retention in terms of recognition and recall ability. While facing some criticism in the following years (Nelson, 1977; Baddeley, 1978) concerning the lack of an independent index of depth, it has remained an influential model of processing, and further empirical studies investigated the effects of these levels of processing with different types of items and modes, such as L1 words in the auditory mode (Rajaram, 1993; Toth, 1996; Karayianni and Gardiner, 2003), L1 words in the visual mode (Rajaram, 1993; Java, 1994; Richardson-Klavehn & Gardiner, 1995; Gardiner, Java & Richardson-Klavehn, 1996), or in pictures (Gardiner, Gregg, Mashru & Thaman, 2001; Konstantinou & Gardiner, 2005). The main conclusion that can be extracted from the previous studies is that processing at a shallow level is sufficient to encode the new items in the semantic memory, and that processing of items at a deeper level registers them in the episodic memory. Craik (2002), in a revision of his theory of levels of processing and empirical studies related to it, acknowledged that the operationalizations of depth of processing had not been very satisfactory and that they had lacked an objective index of depth of processing, addressing Nelson (1977) and Baddeley’s (1978) main criticism to his theory.
Empirical studies in the field of SLA

In the field of SLA, adult L2 learners are known to have a limited processing capability (McLaughlin, 1987). Learners are exposed to the input, in the written or aural form, and part of this input will actually be processed by the learner and become intake. How much of the input becomes intake will depend on a variety of factors (e.g., content complexity and length, grammar complexity, and pragmatic content). VanPatten (1992) reviews the three different processes involved in successful L2 development. The first one is input-to-intake, where some structures of the input are taken in by the learner; the second one is intake-to-acquisition, where some of those taken in structures move one step further and become part of the learner’s repertoire; and a third and final process is acquisition-to-use, where the L2 learner makes use of that repertoire to communicate (cf. VanPatten & Cadierno, 1993). VanPatten’s model, while theoretically sound, did not respond to the question of how the input became intake. Does some type of depth of processing occur in the learner’s mind to account for that transformation?

Shook (1994), in an attempt to probe deeper into the input-to-intake stage, examined the processing of two target forms in Spanish: the present perfect tense and the relative pronouns que, quien(es). The author provided 125 participants with reading passages with the target forms embedded. Participants were 1st or 2nd year students of Spanish. The input was modified and presented under the following conditions: no alteration (control), target form enhancement, and target form enhancement with focus on grammatical rules. Assessment tasks included post-exposure recognition and production tests for both present perfect and relative pronouns. Overall, results yielded a significant improvement when attention had been drawn to the target forms (enhancement conditions). In general, 2nd year students outperformed 1st year students in present perfect production, with an opposite trend observed for relative pronouns production. On the
recognition assessment tests, both years performed better on the present perfect form than on relative pronouns. Shook argued that the recognition results could be expected since the present perfect form is more meaningful than the relative pronouns. However, this argumentation would fail to interpret production results, where 1st year students outperformed 2nd year ones on relative pronouns. Also, Shook argued that further language experience would be expected to translate into a better performance on either target form, which is not the case for relative pronoun production. The author offered no plausible explanation for this finding. Furthermore, in order to address the input-to-intake phenomenon, Shook did not employ any online measurements, but a posttest debriefing questionnaire (offline measure). Therefore, any claims made about the kind of internal processing should be taken carefully, as memory decay could have played an important role. The author also claimed that “the attention conditions under which the learner-readers received the grammatical input can be seen as a factor which may affect Process I” (p. 83).

Again, while we could hypothesize how the experimental conditions (+enhanced, +enhanced+grammar focus, -enhanced) affected the input > intake issue, what actually happened in learners’ minds was not empirically addressed.

Qi and Lapkin (2001) investigated the role of processing in an L2 writing task with its subsequent feedback. They conducted a case study with two Mandarin speakers who were English as a second language (ESL) students with different levels of proficiency. Participants completed a written task in three different stages: (1) They wrote a story based on a writing prompt provided by the researchers who then corrected the composition, reformulating it and making it sound more native-like. (2) 4 days later, both participants received the reformulated version and the original one and had to think-aloud while comparing both versions. (3) 3 days after stage 2, both learners had to write a new version, incorporating the modifications they had
received at stage 2. Analyses of the think-alouds to account for instances of processing revealed that deeper ones resulted in a higher number of corrections which led to a better rewrite. Depth of processing was related to proficiency levels, with the participant having a stronger L2 command yielding more instances of understanding. The authors concluded that reformulation proved to be a valid pedagogical tool, more than the traditional error correction technique. The implications derived from what think-aloud protocols reveal are also discussed, pointing out the prevalence of quality over quantity of noticing and its relation with the level of proficiency in the L2. The researchers ask for caution when interpreting the results, since no strong claims can be made with a pool of two participants. As they put it, their results constitute “tentative rather than definite answers” (p. 294).

Building on Craik and Lockhart’s (1972) depth of processing and on Craik and Tulving’s (1975) notion of elaboration, Laufer and Hulstijn (2001) developed the Involvement Load Hypothesis for L2 vocabulary learning. It consisted of three components: need, search, and evaluation. Need, a more motivational component, was classified as moderate (when imposed by an external agent) or strong (when it was intrinsically motivated). Search and evaluation could also be more or less prominent. Search refers to the learner’s attempt to find the meaning of an unknown L2 word by different means (using a dictionary, etc.). However, if the word was provided by the instructor or glossed in the text, there would be no search involved. Evaluation, on the other hand, entails the comparison of a given word with other words. The evaluation would be moderate if this comparison took place in a given sentence, and strong if it happened in an original context, where it has to be created. The combination of the three and their degrees of prominence constitute the involvement load engaged in processing the new words. The greater the involvement load, the better the retention. According to Laufer and Hulstijn, a greater
involvement load would be equivalent to a deeper level of processing. Their hypothesis was confirmed in subsequent studies (e.g. Hulstijn & Laufer, 2001; Laufer, 2003; Keating, 2008). However, Keating (2008) found that when equating time on task across tasks, the difference on learners’ cognitive load was significantly reduced. While Keating treated time as a separate variable, Hulstijn and Laufer (2001) regarded time as an inherent property of the task, allowing more time for the task that involved a higher cognitive load. Therefore, not isolating time as a variable could bring up a potential confound when interpreting the results.

Gass, Svetics and Lemelin (2003) examined how attention interacted with proficiency and different linguistic areas (syntax, morphosyntax, and lexicon) in L2 Italian. Thirty-four participants, native speakers of English with different proficiency levels in Italian, were assigned to one of two experimental conditions: +/- focused attention (FA), in the three linguistic areas mentioned above, totaling 6 experimental groups. Gass et al. (2003) predicted that + focused attention would carry an effect on lexicon but not on syntax. They premised this idea on previous research (VanPatten, 1994; Schmidt, 1995), where it was suggested that different areas of second language are processed at different levels and require the employment of more or less attentional resources. Their target structures were the placement and agreement features of the Indirect object (IO) and Direct object (DO) (morphosyntactic); the movement of the wh-question word in bi-clausal questions, where the clauses are separated by che or di (that) and there is a verb-subject inversion (syntactic); and five words that were unlikely to be known by the participants (lexicon).

In phase 1, each group in the + focused attention condition received a story with the specific target structures underlined and instructions to focus on these structures. Then, they had questions on the target structures. The –focused attention groups were instructed to read the story
and proceed to complete comprehension questions. In phase 2, the rule was presented with examples for the +FA syntactic and morphosyntactic groups, and instructions to memorize the word and substitute for a synonym were provided to the –FA groups. The +FA lexical item group was instructed to try to guess the meaning, while its –FA counterpart was asked to memorize the word and substitute for a synonym. In phase 3, those in the +FA groups had to change some sentences into question form or sentences with pronouns, with those in the –FA conditions having to substitute a word in the sentences not related to the target structures. Assessment tasks included grammaticality judgment tasks for the morphosyntactic and syntactic groups, and translation of sentences for the lexical item groups.

Results contradicted their hypotheses, with +FA yielding an effect on syntax and morphosyntax, but not on lexicon. The authors argued that +FA seems to be necessary for more complex structures, but not for lexical items. Regarding participants’ proficiency levels, +FA proved to be more effective for all three linguistic areas for lower level participants than for the most advanced ones. This finding suggests that more language experience could override +FA effects. Since no concurrent verbalizations were included in the design, it is hard to claim what participants actually noticed in the different experimental conditions or how they processed the L2 data. Along the same lines, the authors manipulated the input by pre-conditioning the type of attention participants were expected to have during treatment. However, this pre-conception does not necessarily imply that learners have focused on the target structures or paid the ‘expected’ amount of attention. Concurrent verbalizations, on the other hand, would allow us to gain some deeper insight on participants’ minds.

Recently, Bird (2012) conducted a replication of one of Craik and Tulving’s (1975) experiments. Participants in their Craik and Tulving (1975) were native speakers of English
exposed to words in English. Bird (2012) on the other hand compared effects of shallow and deep encoding tasks on recognition of target lexical items with nonnative \((n = 24)\) and native speakers of English \((n = 24)\). Since the non-native English speaking participants had Arabic as their L1, Bird posited that their L1 would be of little help when performing the tasks and subsequent test in English compared to the native speakers. One hundred and twenty target words were split into three blocks of 40 words each, of which 20 were higher frequency and 20 lower frequency words. Participants were assigned to each of these lists. All words rotated so that they appeared in all four of the following conditions: non-semantic yes and no and semantic yes and no. Results replicated those found by Craik and Tulving (1975) in their original study. Deeper processing led to better recognition than shallow processing for both low and high frequency words, and this applied to both native and non-native speakers. Again, as seen in Gass et al. (2003), depth of processing was pre-determined by the inherent characteristics of each condition, and no online measures were employed to see if participants were processing in the expected way. Also, as with Hulstijn and Laufer (2001), these findings are limited to L2 vocabulary, not including other grammatical forms.

Building on a strand of research that examines the allocation of attention to both form and meaning in the L2 (VanPatten, 1990; Greenslade, Bouden, & Sanz, 1999; Wong, 2001), Leow, Hsieh, & Moreno (2008) employed think-alouds to determine whether participants were processing for both meaning and form. Their study was an extension of VanPatten (1990), who had hypothesized that paying attention to grammatical forms would negatively affect participants’ processing for meaning. Participants in VanPatten (1990) were 202 learners of Spanish from different levels: first-semester, fourth-semester, and third-year university students. They were exposed to a 275-word text in Spanish about inflation in Latin America and the
modality of presentation was aural. Learners were randomly assigned to three experimental conditions or a control condition. In the three experimental conditions, subjects either had to pay attention to the lexical item *inflación*, the article *la*, or the third person plural verbal morpheme –*n*. In the control condition learners only listened for content. Testing for meaning was conducted through a free recall task. Overall, results indicated that the condition attending to the lexical item performed similarly to the control condition, while conditions attending to the article *la* or the verb ending –*n* performed more poorly than the control and lexical conditions. Some differences were found when comparing proficiency levels, as with the ending –*n*. In summary, these findings confirmed his hypothesis that grammatical forms would block processing for meaning.

Leow et al. (2008) fine-tuned VanPatten’s methodology in several ways: first, they presented the passage in the written mode, as in Greenslade et al. (1999). Second, they replaced the comprehension free recall task by a 10 item multiple-choice test, explaining that potential memory decay could have influenced the low number of recalls found in VanPatten (1990); third, they also replaced the lexical item *inflación* by the word *sol*, arguing that the former is a cognate of the English term *inflation*, and that, having three syllables, it was more salient than the monosyllabic grammatical items. Finally, they included a direct object clitic *lo*, suggesting that it is “a form that carries both meaning and grammatical function in the input” (p. 674), and not just a grammatical function. Seventy-two second-semester of Spanish participants were randomly assigned to five experimental conditions, which included a control group. However, the main methodological addition for the interests of this study was the inclusion of non-metacognitive think-aloud protocols to operationalize the process of reading for meaning, which was their baseline to compare the experimental conditions. The passage was 358 words long and
participants were 99 second-semester students of Spanish. Findings contradicted those in VanPatten (1990) and Greenslade et al. (1999), and revealed no significant differences in comprehension between conditions, which the authors reasoned could be due to the different modality of the passage: aural versus written. Regarding the think aloud data, three levels of processing were established, and deeper processing was observed for the lexical item *sol* (73%), than for *la* (45%), *lo* or *–n* (31%). These findings, however, did not report a relationship between processing and comprehension scores given that one limitation of this study, which was noted by the authors, was the small number of participants, which made it difficult to make any strong statistical inference.

In an attempt to further explore Leow et al.’s (2008) findings, Morgan-Short et al. (2012) conducted a conceptual replication. In their study, they included the following modifications: (1) A non think-aloud (NTA) group was added to address the potential of reactivity while reading for form and meaning, and (2) the sample size was increased to be able to make stronger claims with regards to the relationship between comprehension and depth of processing. Participants were 361 third-semester students of Spanish. Results revealed a significant effect regarding reactivity but with a minimal effect size, which prevented the authors from making any strong claim on this issue. As in Leow et al. (2008), no significant effect was found between condition and performance in comprehension. Finally, a significant relationship was found between processing levels and performance. The deeper the processing levels, the higher the score on the comprehension test. The authors concluded that a trend where attention to form and meaning does not affect comprehension can be detected in the written modality (Leow et al., 2008). Also, interestingly for the purposes of the present study, a correlation between levels of processing and performance emerged with a larger sample size. One of the limitations of this study, also found
in Leow et al. (2008), was the issue of backtracking during treatment, which was not controlled for. Therefore, some participants could have revisited the reading passage while others did not, creating a potential confound on the interpretation of results. A computer-administered study could prevent this problem.

Hsieh, Moreno, and Leow (forthcoming) revisited Hsieh (2008) that compared two types of instructional conditions: a computerized face-to-face instruction that was teacher-centered and that provided grammatical explanation with no feedback (i.e., more explicit), and a computer-assisted instructional condition that was learner-centered, providing learner-initiated practice with implicit feedback but did not provide any metalinguistic information. Hsieh reported that while similar performances were observed by both groups on the immediate posttest, the less explicit group performed substantially better than the more explicit group on the delayed posttest (2 weeks later). To address this discrepancy in performances, the authors coded the unreported think-aloud protocols in relation to levels of awareness and depth of processing of the target form: *gustar* (to please) produced by the beginning level of Spanish participants. Their findings indicated that while the more explicit type of instruction prompted more instances of awareness at the level of understanding, the less explicit condition revealed more instances of deeper processing, showing a higher cognitive effort by participants in this condition during the experimental instructional exposure. The authors argued that, when not provided with metalinguistic information prior to task, learners need to make an additional cognitive effort to try to infer the target form and that this depth of processing appears to lead to better retention of the target form or structure, as evidenced on the delayed posttests.

**Summary**
As seen in the above studies, there has not been a consistent pattern of results in the L2 depth of processing literature. Both Hulstijn and Laufer (2001) and Bird (2012) found that deeper processing was related to better recognition and retention of L2 vocabulary, but both of these studies assigned participants to specific processing groups and did not collect an online measure of processing to determine whether participants were processing at the expected levels. Also, both studies were conducted only at the word level. Gass et al. (2003) tested morphosyntax and syntax as well as lexical learning, but did not find the expected results in their use of a ± focused attention condition. Shook (1994) found an overall effect when drawing learners’ attention to the enhanced forms but also failed to collect online data on learners’ processing during treatment. Morgan-Short et al. (2012) incorporated think-alouds to account for the relation of depth of processing and performance more accurately, and found that deeper levels of processing resulted in better performance. Leow et al. (2008) did not perform statistical analyses due to the low number of subjects included in the final sample.

These results are indicative of the role that depth of processing might play in SLA, but it is important that studies on depth of processing use online measures, such as think alouds (Leow et al., 2008; Morgan-Short et al., 2012), instead of pre-assigning learners to an expected ‘depth of processing condition’ prior to treatment (Bird, 2012; Gass et al., 2003; Hulstijn & Laufer, 2001; Shook, 1994). With regards to the relationship between types of instruction and depth of processing, this is an area that has yet to be investigated, but would be important in explaining the outcomes found for L2 development in different conditions. Additionally, it is important to determine what learners’ internal differences may also reveal for both depth of processing and also different types of instruction.
Learning styles

Models and empirical studies in SLA

Skehan (1989) stated that matching the instructional style to the individual learning style preferences could lead to more success in the L2 performance than a “one size fits all” approach. This is especially important given that participants are often “artificially” assigned to one instructional/experimental condition or another; and then claims are made about the ‘superiority’ of one instructional condition over another, with no regard for how potential mismatches in learning styles may have affected the results. Expanding on this point, Ehrman (1996, p. 50) claimed that “learning style mismatches are at the root of many learning difficulties”, and according to Dornyei (2005), a teaching approach that takes into consideration the impact of potential styles on learning could severely reduce the presence of mismatches and enhance learning effectiveness.

One of the main (researched) dimensions within learning styles has been the field dependence-independence construct. The field independent (FI) person has been defined as analytic, confident, and self-reliant, while the field dependent (FD) person is considered to be holistic and dependent on others (Chapelle & Green, 1992). The main measurement for FI/FD in SLA has been the embedded figures test (EFT). This test requires the learner to find a simple geometric figure within a more complex figure. A learner being able to find the simple figure will be more FI than FD. Chapelle and Green (1992) caution that it is inadequate to employ just one cognitive measure to infer multiple dimensions of human functioning, and suggest that other means of measurement are also necessary, such as questionnaires. With regards to which style, FD or FI, is better for L2 learning, there is not a clear consensus. While, on the one hand, FI learners have been found to have an overall advantage at formal aspects of the language
One of the first models of learning styles was proposed by Kolb (1984). He proposed the existence of four learning modes that formed two learning dimensions: concrete/abstract thinking and active/reflective information processing. The combination of these two dimensions produced four learning styles preferences: accommodators (concrete/active), divergers (concrete/reflective), convergers (abstract/active), and assimilators (abstract/reflective). He also established his own measuring instrument, the “Learning Style Inventory” (LSI). The original version consisted of nine self-report items. Participants had to rank the items presented in relation to their preferred learning style. The latest version incorporated short statements instead of words and three more items. Using Kolb’s LSI, it was found that Arts students lean towards divergent or assimilative learning styles (Kolb, 1985), Social Sciences students towards accommodative styles (Wilson, 1986), and exact Science students towards convergent styles (Katz, 1988).

Regarding L2 learners, Andreou, Andreou, and Vlachos (2008) used the LSI to investigate different learning styles in comparisons of males and females and arts and science students on English L2 verbal fluency tasks. Four-hundred and fifty-two Greek undergraduate students (146 male, 306 female) participated in the study, 232 of whom were students in the Faculty of Arts and 220 in the Faculty of Science. Results yielded a tendency for females towards a more divergent learning style, corroborating previous findings (Katz, 1988). With regards to the students’ academic majors, the importance of a more divergent style was found for performance on phonological tasks, and an accommodative style was found to be important for syntactic tasks across both academic fields. Results also yielded differences in the relationship
between learning styles and the fluency tasks. For Science students, higher scores on the three verbal tasks were related to a convergent learning style; whereas for Arts students high scores on syntax were closely related to an assimilative style. With these findings in mind, the authors suggested that L2 instructors should aim for a balanced teaching style where all styles are equally represented. They added that research on L2 learners’ learning styles may improve learning, attitudes, behavior, and motivation.

A more recently developed assessment instrument was Reid’s (1995) Perceptual Learning Style Preference Questionnaire (PLSPQ), becoming widely known in the L2 field. Reid’s questionnaire differed from Kolb’s in the inclusion of sensory preferences, categorizing them into visual, auditory, kinesthetic, and tactile types. He also included group and individual learning categories. The questionnaire is formed by 30 statements for the said categories and uses a 5-point Likert scale ranging from “I strongly disagree” to “I strongly agree”. According to Oxford (1995), more than half of learners tend to classify themselves as visual. These learners benefit from visual material, such as pictures, charts, or other graphic forms. Auditory learners prefer lectures or group work discussion. They would benefit from saying out loud what they want to remember. Kinesthetic learners approach learners through whole-body movement. They find walking around while trying to learn something to help, rather than sitting down for a long period of time. Total physical response and role-play activities are ideal for them. Tactile learners, on the other hand, prefer a hands-on learning approach, where they actively build a poster or other visuals.

One study that used Reid’s questionnaire was Peacock (2001). He investigated whether teaching and learning mismatches caused failure, frustration and de-motivation in learning a second language. Participants included 206 EFL students and 46 EFL university professors at a
Chinese institution. Seventy-two percent of the students reported feeling frustrated by a mismatch between teaching and learning styles, 76% added that it severely affected their learning process, and 81% of the professors agreed with Reid’s hypothesis regarding mismatches and their negative effects. Additionally, students favored kinesthetic and auditory over individual and group styles. On the other hand, instructors favored kinesthetic, auditory and group styles over individual and tactile styles. Those learners preferring a group learning style were found to be significantly less proficient than their counterparts leaning towards other styles.

Shen (2010) examined the effects of learning style on L2 lexical inferencing in 145 EFL university students, and whether learning styles correlated with a more explicit instructional program. Learning styles were also measured using Reid’s PLSPQ. The instructional program lasted 15 weeks, during which the teacher integrated the context clues and inference strategies into the curriculum. Practice sessions followed this instructional period. Results revealed that group learners outperformed the rest of styles preferences in their inferencing ability before instruction. They were followed by individual, kinesthetic, tactile, auditory and visual learners (in order or performance). After treatment, a significant effect was found for both auditory and visual learners, followed by individual, kinesthetic, tactile, and group learners. A poorer performance of the group learners was also found in Peacock (2001). These results suggest that learners with certain learning styles, such as auditory and visual, benefited more from the instructional period than the other types. However, this could have been due to the nature of the instruction, which consisted of teacher presentations and teacher-student talking interaction, favoring auditory and visual learners. With this in mind, the author argued that matching teachers’ and students’ styles contributes to the learning success.
Oxford’s (1993) Style Analysis Survey (SAS) is quite similar to Reid’s PLSPQ in that it is not L2-specific and the different items that compose the survey do not refer to any subject matter in particular. One of the main differences resides in its length, with the SAS being longer, with 110 items. A second difference lies in the addition of new style characteristics: extraverted vs. introverted, intuitive-random vs. concrete-sequential, closure-oriented vs. open, and global vs. analytic, making it more complete overall.

Ehrman and Leaver (2003), building on previous work by Ehrman (2001), developed a new construct to tackle learning styles. They provided one single dimension, with the poles on the extremes named ectasis and synopsis. The former refers to the learner who needs to be in control of the process, and the latter to that learner whose approach to learning will be more unconscious. Their construct was completed by 10 subcategories, all of them representing different styles (global vs. particular, inductive vs. deductive, concrete vs. abstract, field dependence vs. field independence, field sensitivity vs. field insensitivity, random vs. sequential, synthetic vs. analytic, analogue vs. digital, leveling vs. sharpening, and impulsive vs. reflective. All of these were reflected on 30 items in their measure instrument using a 9-point scale.

More recently, Cohen, Oxford, and Chi (2001, 2006) drew on Oxford’s SAS and on Ehrman and Leaver’s construct to build the Learning Style Survey (LSS). With regards to the SAS, it incorporated some modifications, such as 11 sub-categories instead of 6; the rating scale was changed from a 4 to a 5-point format; and it also contained some items specific to the L2, as well as non-specific to any subject items. In this survey, there is a section that deals specifically with how learners ‘deal with language rules’ and is designed to measure inductive and deductive learning styles. Of particular interest here are descriptions such as “I like to learn rules of language indirectly by being exposed to examples of grammatical structures and other language
features” or “I like to start with rules and theories rather than specific examples.” These styles are similar to traditional rule-provided or rule-search conditions that have been used in SLA to investigate the effects of more and less explicit instruction (e.g., Robinson, 1996, 1997; Rosa & O’Neill, 1999).

Using Cohen et al.’s LSS (2001, 2006), Tight (2010) explored the learning and retention of concrete nouns in L2 Spanish by presenting instructional materials in four different formats: visual, auditory, tactile/kinesthetic, and in a mixed modality, which combined elements of the three previously mentioned types. He used the LSS to assess participants’ learning style preferences and two different test types: active recall and active recognition to account for learning of vocabulary. Results revealed a significant effect for instructional condition, with the mixed-modality type yielding the strongest learning and retention. Regarding the learning styles reported, the visual modality was clearly preferred, followed by the auditory and the tactile/kinesthetic ones. However, no statistical effect was found when learning style preferences and L2 vocabulary gains were compared. Interestingly, when looking at retention on the delayed posttests, significant benefits arose when matching single-modality instruction to all the perceptual learning style preferences. The author suggested that while matching instructional modality and learning styles might not have an effect on immediate vocabulary learning, it might benefit further retention of that information. However, this study, like Shen (2010), and Hulstijn and Laufer (2001) and Bird (2012) in the strand of depth of processing, was done at the word level, and so it remains to be seen what effect style matches and mismatches might have in learning sentence-level material and grammatical forms, and under different instructional conditions.
Lin (2011) investigated how 90 L1 Chinese speakers’ learning strategies with varying degrees of proficiency in English (Low, intermediate, high) related to the acquisition of L3 Latin assignment of thematic roles in noun clauses, within the Latin project framework. Lin also addressed gender. She employed the Strategy Inventory for Language Learning (SILL) (Oxford, 1990) to measure learners’ strategies, and in order to measure language development, she used written and aural interpretation tests, a grammaticality judgment test, and a written production test. Overall findings revealed that female students and higher L2 proficiency learners tended to use more strategies. However, strategies at the higher level were negatively correlated with accuracy at testing, while strategies used at a lower level of proficiency seemed to correlate more positively. While Learning styles and Learning strategies should not be overlapped and are considered to be different IDs (Dornyei, 2005), Lin argued that the sex differences observed in learning strategies could be explained by learners’ Learning styles. Lin cites Cohen (1993), who said that “language learning styles are general approaches to language learning, while strategies are specific behaviors that learners select in their language learning”. Cohen adds that learners tend to use strategies consistent with their learning styles when dealing with a certain type of task.

Recently, Griffiths (2012) aimed to further investigate whether some learning styles are better than others in terms of effective language learning. Her participants were Turkish students studying ESL. The instrument used was the ILLS (Inventory of Language Learning styles), constructed specifically to suit the characteristics of the research participants and their learning context. Students completed these questionnaires and returned them at their own pace. The researcher correlated the scores obtained from these surveys with their final grades in the class. Her goal was to observe whether some of the preferences were related to lower or higher end-of-
semester grades. The most popular preferences were *speaking in the target language* and *hearing the language spoken* and, in contrast, the least popular were *memorization, learning the rules*, or *concentrating on details*. None of these preferences, more or less popular, appeared to correlate with their final grades in the course. Additional qualitative data obtained via written comments did not yield any other correlation with their grades. The author suggested that for that ESL learning context no learning style preferences seemed to contribute to students’ success or failure in the class.

**Summary**

In sum, these studies point to learning styles as a key factor in helping to explain the variability in task performance across conditions in empirical studies. The work that has been done indicates it is important to consider matching instructional and learning styles for a better outcome in the L2 learning process. However, no work has been done to explore whether outcomes in more or less explicit instruction are related to matches/mismatches in learning styles, specifically those that deal with learning language rules. More attention must be paid to this possible relationship and its role in SLA.

**Rationale for the current study**

While many studies have examined the effects of different types of instruction on performance, and more specifically, of different degrees of explicitness (e.g. Robinson, 1996; Rosa & Leow, 2004; Rosa & O’Neill, 1999; Erlam, 2003; Sanz & Morgan-Short, 2004; Stafford et al., 2012), there remains no clear explanation for why explicit instruction seems to be more beneficial than less explicit instruction in some cases, but not in others. One important aspect to
consider is whether explicit instruction is engaging different levels of processing than less explicit conditions and whether it is those higher depths that lead to positive outcomes. Another explanation may reside in the consideration of individual differences, specifically learning styles, which, by definition, relate to how learners prefer to process input. The relevance of matching teaching and learning styles has been pointed out in the literature (e.g. Peacock, 2001; Shen, 2010; Tight, 2010), but no study has focused on the effect of matching more or less explicit instructional tasks to deductive/inductive styles, among others (Vatz et al., 2013). A study which combined these factors would contribute not only to work on the more explicit vs. less explicit debate in SLA, but would also be the first to investigate how different instructional conditions differing in explicitness relate with depth of processing, and how that depth relates to L2 outcomes; and the first to examine whether learning styles are involved. With this in mind, the proposed study will attempt to respond to the following research questions (RQs):

**Research questions:**

(1) Does the type of instructional condition have an immediate effect on L2 learners’ ability to:

a) interpret and produce all exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

b) interpret and produce old exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

c) interpret and produce new exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

If so, do these abilities last for two weeks?
(2) Do any of the three types of instructional conditions elicit deeper levels of processing as measured by think-aloud protocols?

(3) Is there a relationship between depth of processing, as measured by form-meaning connections in think-aloud protocols during a reading task, and subsequent interpretation and written production of the target form embedded in the reading task?

(4) Is there a relationship between the overall comprehension of a passage and depth of processing of the target form?

(5) Are there differences in the learning and the retention of the Spanish Imperfect subjunctive among L2 learners when their learning style preference (Deductive vs. Inductive) matches or mismatches the instructional condition they have been assigned to?
Chapter 3: RESEARCH METHODS AND DESIGN

Participants

Participants were recruited from 12 sections of Spanish Intermediate classes at a medium-size research university on the East coast. An initial pool of 140 participants signed up to participate in the study. In order to be included in the final sample and in the subsequent statistical analyses, (a) participants had to complete all three sessions of the study, (b) they could not have received formal instruction in a Romance language other than Spanish for more than 2 years, or (c) have been previously exposed to the target form of the study. Fifty-two participants failed to fulfill the previous criteria, and a final sample of 88 participants ($n=88$) were included in subsequent analyses and were then assigned to the six different experimental conditions created for the current experiment. Their ages ranged from 18 to 21 (mean age: 19.2), and they all gave informed consent to participate and received 3.5 extra-credit points towards one of their classroom tests. Students at the intermediate levels were considered to be ideal for this study, as they have not been yet exposed to the form targeted in this study, seen at the advanced levels. Furthermore, they can be expected to be proficient enough in Spanish to complete an experimental task that requires them to pay attention to both form and meaning without struggling excessively, unlike students at beginners’ levels.

Target form

The target form addressed in this study was the Spanish imperfect subjunctive in contrary-to-fact conditional clauses. An example of a conditional sentence and of the imperfect subjunctive (in bold) would be:
(1) *Si aprobaras los exámenes*, *estarías muy contento* (If you passed your exams, you would be very happy).

   The imperfect subjunctive form *aprobaras* appears in the conditional clause introduced by *si*. This clause, as seen in (1), can precede the main clause *estarías muy contento* or it can also follow it reversing the order of the sentence, as in (2):

(2) *Estarías muy contento si aprobaras los exámenes* (You would be very happy if you passed your exams).

   Verbs in Spanish can end in –AR, -ER or –IR in the infinitive form. Since verbs ending in –ER or –IR have different verb endings for the imperfect subjunctive, only verbs ending in –AR were employed in the current study. Presenting verbs of all 3 declensions could have conveyed an excessive burden for participants, considering the nature of the treatment they received, a relatively short reading passage. As observed below, the six personal pronouns in Spanish have five different forms. Following the same rationale to exclude verbs from –ER and –IR declensions, only the forms for the second and third person singular (in bold) were used.

   Full conjugation of the Spanish imperfect subjunctive of verbs ending in –AR

Verb: *HABLAR* (to speak)

*Yo* hablara

*Tú* hablaras

*Él/ella* hablara

Nosotros habláramos

Vosotros hablarais

Ellos/Ellas hablan
The imperfect subjunctive in contrary-to-fact conditional clauses was chosen as the target form for different reasons. First of all, it is usually taught at the advanced level in most Spanish programs, including the university where participants for the present study were recruited from, which broadened the number of students that could participate in the study without having previous knowledge of the target form. Controlling for this aspect ensured that any gains found in the study were consequence of the treatment received in its different experimental conditions. Second, and as seen in (1) above, the imperfect subjunctive in the conditional clause can be translated into English using the past tense. As one of the goals of this study was to observe how deeply participants processed the target forms by analyzing their think-aloud data, being able to provide the equivalent in English facilitated categorizing those forms into one level of processing or another. Finally, the subjunctive has been reported to be a problematic, complex form to be acquired both in the context of L1 and L2 acquisition.

In the L1, López Ornat (1994) argued that one of the factors that make this type of subjunctive a complex form is its semantic complexity. López Ornat observed that children who learn Spanish as their L1 acquire the subjunctive at different stages, and that the adverbial and conditional clauses where the subjunctive is used are two of the last to be learned by the infant. With respect to the conditional clause, she argued that, first, it makes reference to a hypothetical situation taking place in the future, and that could actually be confused with the use of the future tense to express that same purpose. A second factor relates to the fact that the learner is exposed to two different tenses of two different moods in just one sentence that refers to a hypothetical future: the imperfect in the subjunctive mood and the conditional in the indicative mood. This implies a higher degree of abstraction and coordination by the L1 learner to employ the adequate tense in the appropriate clause, since not doing so would render an ungrammatical sentence:

66
(3) *Si aprobarías los exámenes, estarás muy contento* (If you would pass your exams, you will be very happy)

In the SLA field, the Spanish subjunctive has also been considered a challenging structure to be acquired by L2 learners. Numerous studies (Terrell, Baycroft, & Perrone, 1987; Collentine, 1995, 1998; Rosa & Leow, 2004a, 2004b; Fernández, 2008, among others) reported that at the intermediate level of Spanish students still struggled to interpret and produce the present subjunctive in nominal clauses (e.g. Quiero que vayas a casa (I want you to go home/I want that you go home)). Collentine (1995) mentioned that one possible reason to explain this finding was that learners were not developmentally ready to learn the subjunctive in the third or fourth semester of Spanish. According to Collentine (1998), in a typical subjunctive instructional sequence, students see the subjunctive in nominal clauses first, followed by the subjunctive in adjectival clauses (e.g. Busco a un profesor que hable español (I look for a professor that speaks Spanish)), in adverbial clauses (Te llamaré cuando llegue a la Universidad (I will call you when I get to campus)), and in conditional clauses (see examples 1) and 2) above). As the level of complexity increases, the structure where the subjunctive is embedded is seen at later learning stages. Timberlake (2007) posited that the acquisition of modality in Spanish is one of the most challenging aspects for L1 English speakers, as English lacks a specific form to refer to the subjunctive mood, employing in most cases the indicative present or preterite tenses (see subjunctive examples above). The fact that the subjunctive in its different manifestations is considered to be a complex structure for L2 learners has also been investigated in relation to the type of instruction that needs to be provided (as already discussed in chapter 2), which is directly related to the objectives of this research study. Considering the lack of consensus with regards to the necessity of providing explicit grammar information when exposing learners to a complex
target form, the imperfect subjunctive in contrary-to-fact conditionals seems ideal to shed some more light into this issue.

**Materials**

This section describes the different materials used in the present study.

**Instructions varying in their degree of explicitness prior to Task**

Three different types of instructional conditions varying in their degree of explicitness were employed in the current study:

1. The more explicit instructions (Appendix A) presented a detailed explanation defining the target form, the imperfect subjunctive, and how it is used within a conditional sentence. It also showed the endings for the different persons for the imperfect subjunctive for –AR verbs, presenting the whole conjugation of the verb *HABLAR*. It finally instructed that the conditional clause where the imperfect subjunctive is embedded can appear in first or second place in the sentence. The content was partially adapted from a grammar manual, *Repase y Escriba* (Dominicis & Reynolds, 2011), widely used at US universities. An excerpt of the instructions can be seen below:

Instructions for the More explicit condition:

You are going to read a passage in Spanish and then you will be asked some questions in English to see how well you understood the passage. Also, there is a new structure in the passage that you haven’t learned in class yet. So I will explain it to you.

The new structure is called “past subjunctive” and it is used in hypothetical (contrary-to-fact) situations. It is formed by taking the stem from the third-person plural form of the preterite minus –on.

So, if the third-person plural form of the preterite of *hablar* is *hablaron*, we would eliminate –on and have *hablar-*. We would add the past-subjunctive endings –a, -as, -a, -amos, -ais, -an, and we would have the following forms:

hablara
The less explicit instructions (appendix B) just let participants know that they would find a new grammar form in the reading passage that they had not seen before, and that they needed to try to figure out its form and use. They were presented a hint that drew their attention to the conditional *si* clause where the target structure was present. An excerpt of the instructions follows:

Instructions for the Less explicit condition:

You are going to read a passage in Spanish and then you will be asked some questions in English to see how well you understood the passage. Also, there is a new structure in the passage that you haven’t learned in class yet. So your goal will be to try to figure out the rule.

You will see it several times throughout the passage. Your goal is to figure out the grammar rule or rules for that structure. Paying attention to the sentences that contain a *si* clause might help you!

The baseline instructions (Appendix C) just informed participants that they were going to read a passage without making any reference to the new target form (Appendix L). They read as follows:

You are going to read a passage in Spanish and then you will be asked some questions in English to see how well you understood the passage.

Ok, now we are ready. You are going to read the passage in Spanish, and then you will answer some comprehension questions in English based on the text.

**Experimental task**

The experimental task (Appendix D) consisted of a modified version of an authentic reading passage. The length of the passage was of 415 words, a length in line with previous studies that employed a reading task to draw learners’ attention to both meaning and form.
(Greenslade et al., 1999; Leow et al., 2008; Morgan-Short et al., 2012). The target form, the imperfect subjunctive in conditional clauses, appeared 12 times throughout the text embedded in 12 different sentences. In 6 of these times the conditional clause appeared first, and in the other 6 the order was reversed with the main clause appearing in the first place. The title of the passage was *Estudiar mejor: claves del éxito* (*Studying better: keys to succeed*), and, in a nutshell, it offered students advice to improve their studying habits in order to obtain better results at school. An example of a piece of advice was: *Si cuidaras tu salud, te concentrarías mejor en los estudios*. This topic was expected to be familiar and of interest to university students. A first version of this passage was tested in a pilot test with students from a similar level of proficiency to account for any unknown vocabulary and overall difficulty of the test. Some slight modifications (sentence rewording, word modification) were made in order to better adjust it to participants’ level of proficiency.

**Learning Style Survey (LSS)**

The Learning Style Survey (LSS) (Cohen et al., 2001, 2006) (Appendix E) was employed to gather information on participants’ learning style preferences. The LSS has been reported to be representative of previous instruments used in the fields of psychology and SLA that also looked at behavioral correlates of learning styles (Dornyei, 2005; Griffiths, 2012), and it evolved from a valid and reliable learning styles instrument, Oxford’s (1995) SAS (Dornyei, 2005). It is easy to fill out, with Likert-scale responses ranging from 0 (never) to 4 (always), and straightforward to interpret, with some tips for the researcher to better understand the total scores for each category. It addresses eleven different categories, covering a broad range of learning style preferences (e.g. physical senses preference; how to handle possibilities; how to deal with
ambiguities and deadlines, how to receive information, etc). For the purposes of the present study, one of the categories, addressing the deductive/inductive approach to language rules, was utilized. For each preference, the score ranges from 0 to 12. This category fits perfectly with the different instructional conditions participants were exposed to, as explained in 3.3.1 above. A preference for a Deductive or Inductive approach to language rules\(^3\) can create a match or a mismatch with the instructional condition participants have been randomly assigned to, affecting subsequent performance (More details in the Procedure section below). The section of the survey employed in this study is presented below for the reader’s convenience. A higher score for questions 1-3 revealed a preference for a deductive approach, while a higher score for questions 4-6 indicated a preference for an inductive approach. An overall score was calculated by subtracting the score obtained from questions 4-6 from the score obtained from questions 1-3. This gave a score ranging from +12 to -12. The participant that ranged between 0 and 12 was considered to prefer a deductive approach, and those who ranged between 0 and -12 were considered to have a preference for an inductive approach.

Part 8: HOW I DEAL WITH LANGUAGE RULES

1. I like to go from general patterns to the specific examples in learning a target language. 
   0 1 2 3 4
2. I like to start with rules and theories rather than specific examples. 
   0 1 2 3 4
3. I like to begin with generalizations and then find experiences that relate to those generalizations. 
   0 1 2 3 4
   \[A – \text{Total} \quad \]

4. I like to learn rules of language indirectly by being exposed to examples of grammatical structures and other language features. 
   0 1 2 3 4
5. I don’t really care if I hear a rule stated since I don’t remember rules very well anyway. 
   0 1 2 3 4
6. I figure out rules based on the way I see language forms behaving over time. 
   0 1 2 3 4
   \[B – \text{Total} \quad \]

\(^3\) This *deductive-inductive* difference, as expressed in the LSS, would equate the characteristics of the More explicit and Less explicit conditions in the present study.
Learning assessment instruments

In this study learning was operationalized as the ability to interpret and produce the target form. For this matter, three different versions of Interpretation (Appendix F) and Controlled Production (Appendix G) tests were administered to participants 2 weeks before treatment, immediately following treatment, and 2 weeks after treatment.

Interpretation tests

The ability to interpret the target form was measured by a multiple-choice test. Each question described a situation and three possible responses were provided. All of them shared the structure typical of a conditional sentence, with the conditional clause headed by *si* and the main clause with the conditional tense. Since the focus of the present study was on the learning of the imperfect subjunctive, the variation in the responses took place in the conditional clause where the target form was present, while the main clause of the sentence remained the same across all responses. The correct response presented the target form, while the other two alternated the presence of other tenses (e.g. preterite, imperfect, future, present subjunctive), as illustrated in the following example:

María is a physically-gifted athlete at Georgetown, and she trains with less intensity than her teammates. She knows she needs to train harder to win more races.

a) Si María entrenaría más, ganaría más carreras.
b) Si María entrenó más, ganaría más carreras.
c) Si María entrenara más, ganaría más carreras.

Each test consisted of 30 items. 10 of these items targeted the target form and the target verbs (old items), 10 targeted the target form and alternate verbs (new items), and the remaining
10 were distractors, which targeted other grammatical aspects of Spanish (ser/estar and preterite/imperfect contrast, and the use of prepositions). Old, new items and distractors were randomized and presented in a different order for each version of the test. Of the 20 items targeting the imperfect subjunctive, the conditional clause was presented first preceding the main clause in 10 of them, and in second place following the main clause in the other 10.

**Controlled production tests**

The ability to produce the target form was measured by a Controlled-production test. The test followed a fill-in the blank format, where participants had to produce the imperfect subjunctive to complete the sentence. As with the Interpretation test, each test consisted of 30 items (10 old, 10 new, and 10 distractors) presented in a randomized order for each version, with distractors covering other grammatical points, such as the ser/estar and preterite/imperfect contrast, or the present subjunctive. The conditional clause was presented first in the sentence in 10 of the target items and following the main clause in the other 10. An example of one of the items follows:

Si __________________ esta noche, mañana tendrías más energía.

a. descansabas
b. descansarás
c. descansaras

**Selection of old and new exemplars**

As seen in the description of Interpretation and Controlled production tests above, a total of 40 items (10 old and 30 new) were included in the tests. All the verbs were selected from the textbook used at the intermediate levels, *Avance*, to control for any potential confound effect that unfamiliarity with their meaning could cause in the interpretation of results. Additionally, 30 of
these exemplars (10 old and 20 new) were tested in a pilot test conducted prior to the present study. Participants were asked in a background questionnaire to circle those they did not know the meaning of. Those verbs circled by more than 25% of participants were replaced by other verbs. Only two of them, lograr (to achieve) and fastidiar (to bother) were replaced by new verbs, descansar (to rest), and entrenar (to practice), which were deemed to be more accessible for L2 learners at the intermediate level.

**Comprehension test**

Since the experimental task asked participants to read for both meaning and form, a comprehension test (Appendix H) to account for understanding of the reading passage was included in this study. It consisted of ten multiple-choice questions with three possible options per question. Upon observing previous results of a pilot test, three of the questions were slightly modified as they were deemed to be ambiguous and unclear for participants.

**Think-aloud instructions**

As explained more in detail in the Procedure section below, some participants in the present study had to think out loud while concurrently carrying out the experimental task. To that effect, a set of audiovisual think-aloud instructions (Mercer & Adrada-Rafael, unpublished) was created for participants to practice thinking aloud and feeling more comfortable with the procedure before doing it at the actual task. The instructions consisted of a screen and audio recording of a powerpoint where the instructions were also presented in a written mode, and where instructions were read aloud so that participants could both read and listen to them at the same time. Participants were first told that they had to think aloud all the time without trying to
explain what they were thinking, but just say it aloud clearly and loudly on the microphone. Then, they were presented with a fragment of a text and one of the authors, Mercer, modeled a participant thinking aloud, saying out loud any thought that came to his mind while he was reading the text. In this modeling, the importance of thinking aloud, and not just reading the text aloud\(^4\), was emphasized. These instructions were recorded using QuickTime Player and the total length was of approximately four minutes. One of the advantages of recording both the screen and the audio was that participants were forced to read and to listen to all of the instructions, not allowing them to skip any part of them.

**Background questionnaire**

A Background Language questionnaire was employed to gather information on participants with regards to age, languages spoken, years studying Spanish, etc. The last section of the questionnaire also asked participants about their impressions of thinking-aloud to obtain a bigger qualitative picture that complemented the think-aloud data, and whether they had had prior or outside exposure to the target form during the period of time when the study was conducted (5 weeks).

**Design and Procedure**

**Design**

---

\(^4\) A different set of instructions was tested in a pilot test. While transcribing the think-aloud files, it came to the researcher’s attention that some participants had just read aloud the text. This was the main reason why this new set of instructions was designed and implemented in this study.
The study initially consisted of 6 different experimental conditions, varying in their degree of instructional explicitness and in thinking or not thinking aloud. The resulting conditions were: More explicit Think-aloud (META), Less explicit Think-aloud (LETA), Baseline\(^5\) Think-aloud (BLTA), More explicit Non-think-aloud (MENTA), Less explicit Non-Think-aloud (LENTA), and Baseline Non-think-aloud (BLNTA).

The way that the Interpretation and Controlled production tests were administered followed a randomized split-block design. Participants who were randomly assigned to complete version A in the pretest, then completed version B at posttest and C at the Delayed test. The other two possible sequences were B, C, A, and C, A, B. Approximately one third of participants followed each of the sequences.

<table>
<thead>
<tr>
<th>Table 1. Number of participants per condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Participants</td>
</tr>
</tbody>
</table>

In order to control for the presence of reactivity in a) reading Comprehension, b) Interpretation, or c) Controlled Production of the target form, different statistical analyses were conducted (see Results section 4.2 in Chapter 4 for a more detailed explanation). As these revealed no reactivity\(^6\), the Think-aloud and Non-think-aloud conditions were merged for the rest of the analyses, resulting in three conditions that differed in their degree of explicitness: 1) More explicit, 2) Less explicit, and 3) Baseline.

\(^5\) As this condition was exposed to meaningful input when reading the passage, it cannot be considered a pure control condition, but a baseline condition.

\(^6\) Results, as will be discussed, are in line with previous studies employing highly controlled testing instruments. It is important to note that reactivity has been found in most cases outside this type of testing (i.e., less controlled writing).
Table 2. Number of participants per condition after merging TA and NTA conditions

<table>
<thead>
<tr>
<th>Participants</th>
<th>More explicit</th>
<th>Less explicit</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>28</td>
<td>31</td>
<td>29</td>
</tr>
</tbody>
</table>

**Procedure**

The study materials and procedures were approved by the university Internal Review Board (IRB study number 2013-1064). Except for the Learning Style Survey, all the other materials were presented on Blackboard. The advantages of using Blackboard to conduct the study were numerous: It allowed the researcher to assign a specific amount of time to the task in question and to choose which tasks were made available to participants for each session. It also controlled for any potential backtracking, keeping participants from going back to previous questions or to revisit the reading passage after submission. A third advantage was that all grades were automatically saved into a gradebook and could be easily exported into an excel sheet. Finally, participants were very familiar with this software, amply used at foreign language courses, not having been necessary for participants to spend some preliminary time becoming acquainted with it.

The study consisted of 3 sessions (Table 3 for Procedure and times\(^7\)). All sessions took place in a language laboratory equipped with Mac computers and sets of headphones with a microphone to record the Think-alouds. Session 1 took place two weeks before treatment. Participants came to the laboratory and completed, in this order, the Informed consent to participate voluntarily in the study, the Controlled-production and Interpretation pretests and the Learning Style survey.

\(^7\) Times for instructions and tasks were piloted and slightly modified for this study.
At treatment, 2 weeks after session 1, participants were randomly assigned to the experimental conditions. Those in the Think-aloud conditions completed the tasks in the following order: 1) Think-aloud practice/instructions, 2) Instructions varying in explicitness, 3) Experimental task (Reading passage) (+ TA), 4) Comprehension test, 5) Production and Interpretation posttests. Those assigned to the silent conditions followed the same order of tasks starting at (2) Instructions varying in explicitness.

In session 3, 2 weeks after treatment, participants completed the Controlled-production and Interpretation delayed posttests and then the Background Questionnaire.

**Coding**

For Comprehension, Interpretation and Controlled production tests, participants were given 1 point for each right answer provided in the tests and 0 for a wrong answer. Responses had been assigned on Blackboard. For the Controlled production tests, in addition to a strict scoring, a lenient scoring was considered when participants provided the target form in one of the two following ways: 1) right tense but wrong person agreement (e.g., tú *hablar* instead of tú *hablaras*); 2) right tense with a spelling error (e.g., él *entenara* instead of él *entrenara*). Thus, participants showed they had acquired a partial understanding of the target form, even if they were not able to produce the target form strictly correct.

Table 3. Procedure

<table>
<thead>
<tr>
<th>WEEK 1</th>
<th>WEEK 3</th>
<th>WEEK 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>Session 2</td>
<td>Session 3</td>
</tr>
<tr>
<td>(45 min. approx.)</td>
<td>(60 min. approx.)</td>
<td>(40 min. approx.)</td>
</tr>
</tbody>
</table>
Therefore, two separate scoring scales (Strict and Lenient) for the Controlled-production tests were computed for the analyses conducted later on in the study. Participants’ instances of processing found in the think-aloud data were categorized into three different levels: low, intermediate, and deep, assigning them a 1, 2, or 3 value respectively (e.g., Leow et al., 2008; Morgan-Short et al., 2012; Hsieh et al., forthcoming). Criteria to decide which level they would fall into were slightly adapted from Leow et al. (2008) (see Table 4) to fit with the type of experimental task employed in this study. Considering the qualitative nature of the data, 20% of this were coded and compared with two additional raters to calculate the interrater reliability. The resulting agreement was high: 97.57% (see Table 5 for individual raters’ agreement).
Table 4. Operationalization of Depth of Processing (DOP) Grammatical Items

<table>
<thead>
<tr>
<th>Description</th>
<th>Low depth of processing</th>
<th>Intermediate depth of processing</th>
<th>Deep depth of processing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shows no potential for processing target form grammatically</td>
<td>Comments on target item in relation to grammatical features</td>
<td>Arrives at a partially, fully, or (in)accurate target underlying grammatical rule</td>
</tr>
<tr>
<td>Descriptors</td>
<td>-Reads target quickly</td>
<td>-Spends a bit more time processing target item</td>
<td>-Makes hypotheses regarding target item</td>
</tr>
<tr>
<td></td>
<td>-Translates the phrase to English but leaves the target in Spanish</td>
<td>-Makes comments that indicate some processing of target item</td>
<td>-Provides a partially, fully, or (in)accurate target underlying grammatical rule</td>
</tr>
<tr>
<td></td>
<td>-Carefully pronounces target item</td>
<td>-Carefully emphasizes target word or structure (including rising intonation or prolonging some sounds or syllables, or saying “oh!”)</td>
<td>-Provides correct translation of target form</td>
</tr>
<tr>
<td></td>
<td>-Repeats target item</td>
<td>-Significant Pause before or after the target form</td>
<td>-Corrects, or ostensibly attempts to correct, a previous translation</td>
</tr>
<tr>
<td></td>
<td>-Says s/he isn’t sure what it is</td>
<td>-Does not spend much time processing target item</td>
<td>-Spends much time processing target item</td>
</tr>
<tr>
<td></td>
<td>-Low level of cognitive effort to process target item grammatically</td>
<td>-Low level of cognitive effort to process target item grammatically</td>
<td>-High level of cognitive effort to process target item (un)grammatically</td>
</tr>
</tbody>
</table>

Table 5. Individual Raters’ agreement and total agreement.

<table>
<thead>
<tr>
<th>Rating agreement</th>
<th>R1-R2</th>
<th>R1-R3</th>
<th>R2-R3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=.100</td>
<td>r=.100</td>
<td>r=.927</td>
<td>r=.976</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 4: RESULTS

This chapter reports the results for each of the 5 research questions proposed at the end of Chapter 2. All statistical analyses were performed using SPSS 22, except for the analyses for RQ4, conducted with STATA. The alpha level was set at 0.05 throughout all analyses. Since a large variation in results was visually detected for the Interpretation pretest scores, only participants scoring < 17 were selected for Interpretation tests analyses, after running an analysis of frequencies with SPSS. That large variation meant that some of the participants scored very high, which could provoke a ceiling effect if included in the analyses. Those high scores could be due to a chance component rather than to previous knowledge, considering the very low scores at the production tests. < 17 was chosen as the cutoff point, and not a lower score, to avoid that the sample size was drastically reduced for the Interpretation scores analyses, subsequently affecting the validity of the findings. For RQs 3, 4, and 5 addressing DOP as measured by think-aloud protocols, only participants in the TA conditions were included in the analyses. Effect sizes (partial eta squared, $\eta^2$) are reported following Larson-Hall (2010) and Cohen’s (1988) guidelines of .01 (small), .06 (medium), and .14 (large). Test reliability was calculated for Interpretation, Production and Comprehension tests, and for the Learning Style Survey. Most values fall within a range (.60 - .80) considered acceptable-good for the social sciences (Larson-Hall, 2010).

Test Reliability

<table>
<thead>
<tr>
<th>Test</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation test, version A</td>
<td>.70</td>
</tr>
<tr>
<td>Interpretation test, version B</td>
<td>.68</td>
</tr>
<tr>
<td>Interpretation test, version C</td>
<td>.63</td>
</tr>
<tr>
<td>Controlled Production test, version A</td>
<td>.62</td>
</tr>
</tbody>
</table>
Controlled Production test, version B | .76  
Controlled Production test, version C | .69  
Reading Comprehension test | .86  
Learning Style Survey | .72

**Preliminary analyses**

Before addressing the study RQs, preliminary analyses were run to ensure that there was homogeneity at pretests among groups. In other words, the goal of these analyses was to show that any existing differences observed after treatment were a result of the treatment itself, and not of inherent differences among conditions. A One-way ANOVA was performed with the Interpretation pretest scores as Dependent Variable and the experimental conditions as Fixed Factor. The analysis revealed no significant differences among groups, $F(5, 71) = .656, p = .66$, partial $\eta^2 = .044$, observed power = .23. No statistical analysis was run for the Controlled production pretest, as a visual inspection observed that most participants across conditions scored 0, and an overall homogeneity was assured. Two additional One-way ANOVAs were performed with old and new items Interpretation pretest scores as Dependent variable. Neither the ANOVA with old items $F(5, 71) = .694, p = .63$, partial $\eta^2 = .047$, observed power = .24, nor the one with new items $F(5, 71) = .540, p = .74$, partial $\eta^2 = .037$, observed power = .19, yielded any statistically significant differences among conditions. These results granted a significant homogeneity among groups prior to treatment at both Interpretation and Production pretest scores for total, old and new items.

**Controlling for reactivity**
To control for reactivity, four different One-way ANOVAS were performed with Comprehension, Controlled production (strict and lenient grading) and Interpretation posttests scores as Dependent Variables and the six experimental conditions entered as Fixed Factor. The first One-way ANOVA (see Table 6 for Descriptive statistics) revealed no significant differences among groups for the Comprehension test, $F (5, 82) = 1.727, p = .14$, partial $\eta^2 = .095$, observed power = .57.

Table 6. Descriptive statistics for Comprehension results at Posttest

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Posttest M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>META</td>
<td>15</td>
<td>7.40</td>
<td>1.55</td>
</tr>
<tr>
<td>LETA</td>
<td>15</td>
<td>7.87</td>
<td>.99</td>
</tr>
<tr>
<td>BLTA</td>
<td>15</td>
<td>7.07</td>
<td>1.16</td>
</tr>
<tr>
<td>MENTA</td>
<td>13</td>
<td>7.15</td>
<td>1.28</td>
</tr>
<tr>
<td>LENTA</td>
<td>16</td>
<td>7.37</td>
<td>1.15</td>
</tr>
<tr>
<td>BLNTA</td>
<td>14</td>
<td>8.14</td>
<td>1.02</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>7.50</td>
<td>1.23</td>
</tr>
</tbody>
</table>

*Note.* Total possible score = 10.

The second One-way ANOVA (see Table 7 for Descriptive statistics) revealed a significant difference for production (strict), $F (5, 82) = 4.600, p = .001$, partial $\eta^2 = .219$, observed power = .97. A subsequent post-hoc Scheffé analysis revealed a significant difference between the LENTA and the BLNTA conditions, but it did not show any significant difference between Think-aloud and Non-think-aloud conditions.

Table 7. Descriptive statistics for Production results (strict) at Posttest

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Posttest M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>META</td>
<td>15</td>
<td>9.67</td>
<td>7.58</td>
</tr>
<tr>
<td>LETA</td>
<td>15</td>
<td>6.47</td>
<td>7.50</td>
</tr>
<tr>
<td>BLTA</td>
<td>15</td>
<td>2.40</td>
<td>6.34</td>
</tr>
</tbody>
</table>
The third One-way ANOVA (see Table 8 for Descriptive statistics) revealed again a significant difference for production (lenient), $F(5, 82) = 5.311$, $p = .00$, partial $\eta^2 = .24$, observed power = .98. The post-hoc Scheffé analysis yielded a significant difference in performance when comparing the MENTA and LENTA groups with the BLNTA group, but again, it did not reveal any significant difference when comparing Think-aloud and Non-think-aloud conditions.

Table 8. Descriptive statistics for Production results (Lenient) at Posttest

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Posttest M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>META</td>
<td>15</td>
<td>11.60</td>
<td>8.51</td>
</tr>
<tr>
<td>LETA</td>
<td>15</td>
<td>8.60</td>
<td>8.89</td>
</tr>
<tr>
<td>BLTA</td>
<td>15</td>
<td>2.60</td>
<td>6.86</td>
</tr>
<tr>
<td>MENTA</td>
<td>13</td>
<td>12.69</td>
<td>8.85</td>
</tr>
<tr>
<td>LENTA</td>
<td>16</td>
<td>12.19</td>
<td>9.53</td>
</tr>
<tr>
<td>BLNTA</td>
<td>14</td>
<td>1.64</td>
<td>5.31</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>8.24</td>
<td>9.11</td>
</tr>
</tbody>
</table>

*Note. Total possible score = 20.*

A fourth One-way ANOVA (see Table 9 for Descriptive statistics) performed on the Interpretation posttest rendered no significant differences in performance among groups, $F(5, 71) = 2.903$, $p = .10$, partial $\eta^2 = .17$, observed power = .82.

Table 9. Descriptive statistics for Interpretation results at Posttest

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Posttest M</th>
<th>SD</th>
</tr>
</thead>
</table>

84
Finally, time on task was compared among groups by running a One-way ANOVA (see Table 10 for Descriptive statistics). Results, $F (5, 82) = 12.561, p = .00$, partial $\eta^2 = .434$, observed power = 1.00, revealed significant latency effects. A post-hoc Scheffé analysis indicated that the three Think-aloud conditions spent significantly more time completing the experimental task than the three equivalent silent conditions. Since only a main effect for latency\(^8\) was found but not for performance, the Think-aloud and Non-think-aloud conditions were merged for the analyses of RQ 2, resulting in 3 groups: 1) More explicit, 2) Less explicit, and 3) Baseline.

Table 10. Descriptive statistics for Time spent on experimental task (in seconds)

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>META</td>
<td>15</td>
<td>647.20</td>
<td>146.51</td>
</tr>
<tr>
<td>LETA</td>
<td>15</td>
<td>702.60</td>
<td>142.42</td>
</tr>
<tr>
<td>BLTA</td>
<td>15</td>
<td>696.27</td>
<td>190.05</td>
</tr>
<tr>
<td>MENTA</td>
<td>13</td>
<td>347.31</td>
<td>119.98</td>
</tr>
<tr>
<td>LENTA</td>
<td>16</td>
<td>476.75</td>
<td>196.06</td>
</tr>
<tr>
<td>BLNTA</td>
<td>14</td>
<td>392.57</td>
<td>192.75</td>
</tr>
</tbody>
</table>

Note. Total possible score = 20.

---

\(^8\) Bowles (2010) reported that most reactivity studies controlling for time found latency effects when comparing TA and NTA conditions. By latency, she referred to the time participants spent on task and/or test.
Response to Research Question 1: Does the type of instructional condition have an immediate effect on L2 learners’ ability to:

a) interpret and produce all exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

b) interpret and produce old exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

c) interpret and produce new exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

If so, do these abilities last for two weeks?

To respond to RQ1, a series of 3x3 (Time x Condition) Repeated-measures ANOVAS were performed for a) all exemplars, b) old exemplars, and c) new exemplars, for the Interpretation and Controlled production tests. Condition (More explicit, Less explicit, and Baseline) was entered as the between-subject factors, and Time (pretest, posttest, and delayed test) as the within-subject factors.

A first 3x3 Repeated-measures ANOVA for Interpretation (see Table 11 for Descriptive statistics) revealed a main effect for Time, $F(2, 148) = 21.672, p = .00$, partial $\eta^2 = .23$, observed power = 1.00; and a main effect for Condition, $F(2, 74) = 5.318, p = .007$, partial $\eta^2 = .126$, observed power = .82. However, no significant interaction was found between Time and Condition, $F(4, 148) = 2.102, p = .083$, partial $\eta^2 = .054$, observed power = .61. A post-hoc analysis for Condition yielded a significant difference between the Less explicit and the Baseline
conditions, with the first outperforming the second, $p = .008$. The graph (see Figure 1) appears to indicate that this difference occurred at Posttest. One-way ANOVAS of post and delayed tests were conducted in order to further elucidate the differences at performance at both points in time among groups. For the posttest, a main effect was found, $F(2, 74) = 7.317, p = .001$, partial $\eta^2 = .165$, observed power = .93. The post-hoc Scheffé analysis revealed that both the More explicit and the Less explicit groups significantly outperformed the Baseline group ($p = .022$, and $p = .002$ respectively). On the other hand, the One-way ANOVA for the delayed test did not yield any significant difference in performance among groups, $F(2, 74) = 2.421, p = .096$, partial $\eta^2 = .061$, observed power = .47. Since the Baseline condition appeared to show a regular improvement over time, a Repeated-measures ANOVA was performed to observe whether that improvement reached significance. Results rendered a non-significant effect for Time, $F(2, 44) = 1.467, p = .24$, partial $\eta^2 = .063$, observed power = .30.

Table 11. Descriptive statistics for Interpretation scores

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest M</th>
<th>Posttest SD</th>
<th>Delayed posttest M</th>
<th>Delayed posttest SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More explicit</td>
<td>26</td>
<td>8.23</td>
<td>4.08</td>
<td>13.69</td>
<td>5.61</td>
<td>11.19</td>
<td>6.39</td>
</tr>
<tr>
<td>Less explicit</td>
<td>28</td>
<td>8.21</td>
<td>3.80</td>
<td>15.00</td>
<td>6.17</td>
<td>13.28</td>
<td>7.22</td>
</tr>
<tr>
<td>Baseline</td>
<td>23</td>
<td>7.17</td>
<td>4.30</td>
<td>9.08</td>
<td>5.12</td>
<td>9.30</td>
<td>5.43</td>
</tr>
<tr>
<td>Total</td>
<td>77</td>
<td>7.90</td>
<td>4.02</td>
<td>12.79</td>
<td>6.14</td>
<td>11.38</td>
<td>6.57</td>
</tr>
</tbody>
</table>

*Note. Total possible score = 20.*

Figure 1. Interpretation scores per condition
A second 3x3 ANOVA was performed for Controlled production results (strict scoring) (see Table 12 for Descriptive statistics), rendering a main effect for time, $F(2, 170) = 37.324, p = .00$, partial $\eta^2 = .305$, observed power = 1.00; a main effect for Condition, $F(2, 85) = 7.102, p = .001$, partial $\eta^2 = .143$, observed power = .92; and a significant interaction between Time and Condition, $F(4, 170) = 5.647, p = .00$, partial $\eta^2 = .117$, observed power = .98. A post-hoc Scheffé analysis revealed that the More explicit and the Less explicit conditions significantly outperformed the Baseline condition ($p = .020$, and $p = .003$ respectively). A look at the graph (see Figure 2) shows this advantage especially at posttest, but not at the delayed test, where there
is a decrease in results for both conditions, although sharper for the More explicit group. In contrast, the Baseline group appeared to slightly improve their performance at the delayed test. In order to further investigate these differences at the delayed test, a One-way ANOVA was performed, and while it did not yield a statistically significant difference, it did reveal a trend towards significance when comparing the Less explicit and the Baseline conditions performances, $F(2, 85) = 2.994, p = .055$, partial $\eta^2 = .066$, observed power = .57. A separate Repeated-measures ANOVA was conducted for the Baseline condition, and it showed that it benefited significantly from treatment over time, $F(2, 56) = 3.441, p = .032$, partial $\eta^2 = .116$, observed power = .65.

Table 12. Descriptive statistics for Production scores (Strict scoring)

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Delayed posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>More explicit</td>
<td>28</td>
<td>.071</td>
<td>.37</td>
<td>9.67</td>
</tr>
<tr>
<td>Less explicit</td>
<td>31</td>
<td>.22</td>
<td>.76</td>
<td>8.77</td>
</tr>
<tr>
<td>Baseline</td>
<td>29</td>
<td>.31</td>
<td>1.07</td>
<td>1.89</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>.20</td>
<td>.79</td>
<td>6.79</td>
</tr>
</tbody>
</table>

*Note. Total possible score = 20.*

Figure 2. Production scores per condition (strict scoring)
A third 3x3 ANOVA on all exemplars was performed for Controlled production results (Lenient scoring) (see Table 13 for Descriptive statistics). It rendered a main effect for Time, $F(2, 170) = 41.534, p = .00$, partial $\eta^2 = .328$, observed power = 1.00; a main effect for Condition, $F(2, 85) = 7.886, p = .001$, partial $\eta^2 = .157$, observed power = .95, and a significant interaction between Time and Condition, $F(4, 170) = 7.116, p = .00$, partial $\eta^2 = .143$, observed power = .99. As observed in the previous ANOVA on strict scoring, a subsequent post-hoc Scheffé analysis showed a significant difference in performance over time for the More and Less explicit
conditions over the Baseline condition \((p = .010, \text{ and } p = .002\) respectively). The graph (see Figure 3) revealed, once again, a clear difference at posttest, but a not-so-clear difference when examining the delayed test results of the different groups. In order to further scrutinize these differences at the delayed test, a One-way ANOVA was conducted and yielded a trend towards significance when comparing the Less explicit and the Baseline conditions, \(F(2, 85) = 2.889, p = .06\), partial \(\eta^2 = .064\), observed power = .55. Overall, findings from both Repeated-measures ANOVAS on Production (strict and lenient scorings) are quite comparable, with a sharp improvement for both More and Less explicit groups from pretest to posttest, and a more pronounced decrease at delayed test for the More explicit condition. In both analyses, the Less explicit condition is very close to significantly outperform the Baseline condition 2 weeks after treatment.

Table 13. Descriptive statistics for Production scores (Lenient scoring)

<table>
<thead>
<tr>
<th>Condition</th>
<th>(N)</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Delayed posttest</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>More explicit</td>
<td>28</td>
<td>.071</td>
<td>.37</td>
<td>12.10</td>
</tr>
<tr>
<td>Less explicit</td>
<td>31</td>
<td>.38</td>
<td>1.52</td>
<td>10.45</td>
</tr>
<tr>
<td>Baseline</td>
<td>29</td>
<td>.48</td>
<td>1.57</td>
<td>2.13</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>.31</td>
<td>1.29</td>
<td>8.23</td>
</tr>
</tbody>
</table>

*Note.* Total possible score = 20.

Figure 3. Production scores per condition (Lenient scoring)
Old and New items

Old items

A 3x3 Repeated-measures ANOVA on Old items (see Table 14 for Descriptive statistics) was performed for Interpretation scores, and it revealed a main effect for Time, $F (2, 148) = 16.059, p = .00$, partial $\eta^2 = .178$, observed power = 1.00; and a main effect for Condition, $F (2, 74) = 4.954, p = .01$, partial $\eta^2 = .118$, observed power = .79. However, no significant interaction between Time and Condition was found $F (4, 148) = 2.225, p = .069$, partial $\eta^2 = .057$, observed power = .64. A post-hoc Scheffé analysis indicated that the Less explicit condition performed significantly better than the Baseline condition, $p = .013$. The graph (Figure 4) appeared to show
a similar performance for the More and Less explicit conditions at posttest, but a better retention of the target form for the Less Explicit group two weeks later when compared to the other two conditions. Two One-way ANOVAs were performed to further examine these differences at specific points in time (post and delayed tests). The first One-way ANOVA revealed a significant difference in performance at posttest, $F(2, 74) = 7.407, p = .00$, partial $\eta^2 = .167$, observed power = .93. The post-hoc analysis showed that both the More and the Less explicit groups scored significantly better than the Baseline group ($p = .007$, and $p = .004$ respectively). In contrast, a second One-way ANOVA comparing delayed test results did not yield any significant difference among groups, $F(2, 74) = 2.307, p = .107$, partial $\eta^2 = .059$, observed power = .45.

Table 14. Descriptive statistics for Interpretation of old items.

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest M</th>
<th>SD</th>
<th>Posttest M</th>
<th>SD</th>
<th>Delayed posttest M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More explicit</td>
<td>26</td>
<td>3.80</td>
<td>2.38</td>
<td>6.92</td>
<td>2.82</td>
<td>5.30</td>
<td>3.56</td>
</tr>
<tr>
<td>Less explicit</td>
<td>28</td>
<td>3.78</td>
<td>2.39</td>
<td>7.07</td>
<td>3.32</td>
<td>6.32</td>
<td>3.84</td>
</tr>
<tr>
<td>Baseline</td>
<td>23</td>
<td>3.52</td>
<td>2.23</td>
<td>4.17</td>
<td>2.58</td>
<td>4.21</td>
<td>2.85</td>
</tr>
<tr>
<td>Total</td>
<td>77</td>
<td>3.71</td>
<td>2.31</td>
<td>6.15</td>
<td>3.19</td>
<td>5.35</td>
<td>3.54</td>
</tr>
</tbody>
</table>

*Note.* Total possible score = 10.

Figure 4. Interpretation scores for old items per condition
A 3x3 ANOVA on old items for Controlled production scores (strict grading) (see Table 15 for Descriptive statistics) yielded a significant effect for Time, $F(2, 170) = 37.673, p = .00$, partial $\eta^2 = .307$, observed power = 1.00; a significant effect for Condition, $F(2, 85) = 8.572, p = .00$, partial $\eta^2 = .168$, observed power = .96; and a significant interaction between Time and Condition, $F(4, 170) = 6.340, p = .00$, partial $\eta^2 = .130$, observed power = .99. A post-hoc Scheffé analysis indicated that the More and the Less explicit conditions performed significantly better than the Baseline condition ($p = .009$, and $p = .001$ respectively). A closer examination of the graph (Figure 5) reveals that this difference probably took place at the immediate posttest,
and it also shows that the Less explicit group maintained the accuracy of the new target form at the delayed posttest, two weeks later, better than the More explicit group. In order to elucidate these differences, two One-way ANOVAs were conducted at posttest and at delayed tests to compare performances among groups. The first One-way ANOVA, as expected, revealed a significant difference at posttest, $F(2, 85) = 11.166$, $p = .00$, partial $\eta^2 = .208$, observed power = .99; and the subsequent post-hoc Scheffé analysis indicated that the More and the Less explicit conditions clearly outperformed the Baseline group ($p = .00$, and $p = .002$ respectively). The second One-way ANOVA showed a significant difference among groups at the delayed test, $F(2, 85) = 4.114$, $p = .02$, partial $\eta^2 = .088$, observed power = .71. A look at the post-hoc Scheffé analysis revealed that the Less explicit condition performed significantly better than the Baseline condition, $p = .021$, but the More explicit group, on the other hand, fell short of reaching significance when compared to the Baseline condition.

Table 15. Descriptive statistics for production of old items (Strict scoring)

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest M</th>
<th>Posttest SD</th>
<th>Delayed posttest M</th>
<th>Delayed posttest SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More explicit</td>
<td>28</td>
<td>.00</td>
<td>.00</td>
<td>5.07</td>
<td>3.66</td>
<td>2.57</td>
<td>3.73</td>
</tr>
<tr>
<td>Less explicit</td>
<td>31</td>
<td>.19</td>
<td>.65</td>
<td>4.29</td>
<td>4.14</td>
<td>4.22</td>
<td>4.49</td>
</tr>
<tr>
<td>Baseline</td>
<td>29</td>
<td>.10</td>
<td>.40</td>
<td>.89</td>
<td>2.71</td>
<td>1.44</td>
<td>2.87</td>
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<tr>
<td>Total</td>
<td>88</td>
<td>.10</td>
<td>.45</td>
<td>3.42</td>
<td>3.96</td>
<td>2.78</td>
<td>3.91</td>
</tr>
</tbody>
</table>

*Note.* Total possible score = 10.

Figure 5. Production scores for old items (strict scoring) per condition
A 3x3 Repeated-measures ANOVA was performed on old items for Controlled production results (Lenient grading) (see Table 16 for Descriptive statistics), revealing a significant effect for Time, $F(2, 170) = 45.094, p = .00$, partial $\eta^2 = .347$, observed power = 1.00; a significant effect for Condition, $F(2, 85) = 9.605, p = .00$, partial $\eta^2 = .184$, observed power = .98; and a significant interaction between Time and Condition, $F(4, 170) = 8.110, p = .00$, partial $\eta^2 = .16$, observed power = 1.00. The post-hoc Scheffé analysis revealed that the More explicit and Less explicit conditions performed significantly better across time than the Baseline condition ($p = .004$ and $p = .001$ respectively). An analysis of the graph (see Figure 6) shows that the More explicit group surpasses the Less explicit at posttest, but the delayed test
performance indicates a similar trend to that observed in prior analyses, that is, the Less explicit group outperforming the More explicit one, which shows a sharp decrease from posttest to delayed test. Two One-way ANOVAs at posttest and at delayed test were then performed to observe whether the differences between these two groups and the Baseline condition did actually reach significance. The first ANOVA revealed a significant difference in performance, \( F(2, 85) = 14.744, p = .00, \) partial \( \eta^2 = .258, \) observed power = 1.00. The post-hoc Scheffé analysis (Table 23) rendered a significant difference at posttest when comparing the More and Less explicit conditions with the Baseline condition \( (p = .00) \). The second ANOVA revealed again a significant difference at the delayed test, \( F(2, 85) = 3.774, p = .027, \) partial \( \eta^2 = .082, \) observed power = .67. The post-hoc analysis yielded a significant difference in performance between the Less explicit and the Baseline conditions, \( p = .029. \) In contrast, the difference between the More explicit and the Baseline conditions was not significant.

Table 16. Descriptive statistics for production of old items (Lenient scoring)

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest M</th>
<th>Posttest SD</th>
<th>Delayed posttest M</th>
<th>Delayed posttest SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More explicit</td>
<td>28</td>
<td>.00</td>
<td>.00</td>
<td>6.39</td>
<td>4.13</td>
<td>2.92</td>
<td>4.05</td>
</tr>
<tr>
<td>Less explicit</td>
<td>31</td>
<td>.32</td>
<td>1.30</td>
<td>5.25</td>
<td>4.51</td>
<td>4.70</td>
<td>4.79</td>
</tr>
<tr>
<td>Baseline</td>
<td>29</td>
<td>.13</td>
<td>.44</td>
<td>1.03</td>
<td>2.99</td>
<td>1.79</td>
<td>3.44</td>
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<tr>
<td>Total</td>
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<td>.81</td>
<td>4.22</td>
<td>4.53</td>
<td>3.18</td>
<td>4.28</td>
</tr>
</tbody>
</table>

*Note.* Total possible score = 10.

Figure 6. Production scores for old items (Lenient scoring) per condition
New items

A 3x3 Repeated-measures ANOVA was conducted on new items for Interpretation results (see Table 17 for Descriptive statistics) and it shed a main effect for Time, $F(2, 148) = 20.196, p = .00$, partial $\eta^2 = .214$, observed power = 1.00; for Condition, $F(2, 74) = 4.610, p = .013$, partial $\eta^2 = .111$, observed power = .76; and a non-significant interaction between Time and Condition, $F(4, 148) = 1.496, p = .20$, partial $\eta^2 = .039$, observed power = .46. A post-hoc Scheffé analysis revealed that the Less explicit condition significantly outperformed the Baseline condition, $p = .013$, unlike the More explicit group. The graph (Figure 7) suggests a better performance for the Less explicit condition at Posttest, and an apparent similar decrease from...
posttest to delayed test for both More and Less explicit conditions. Interestingly, the Baseline group seemed to actually slightly improve their results from post to delayed test. In order to figure out at which point in time the significant difference between the Less explicit and the Baseline conditions took place, two One-way ANOVAS were run with posttest and delayed test scores as dependent variables respectively. The first One-way ANOVA yielded a significant difference in performance, $F(2, 74) = 6.192, p = .00$, partial $\eta^2 = .143$, observed power $= .88$. A post-hoc Scheffé analysis revealed that the Less explicit condition performed significantly better than the Baseline condition, $p = .00$. On the contrary, the difference in performance between the More explicit and the Baseline conditions fell short of reaching significance. A second One-way ANOVA to compare performance among conditions at the delayed test did not reach significance, $F(2, 74) = 2.008, p = .14$, partial $\eta^2 = .051$, observed power $= .40$ suggesting that the significant difference at performance found at the posttest attenuated two weeks later.

Table 17. Descriptive statistics for the interpretation of new items

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest M</th>
<th>SD</th>
<th>Posttest M</th>
<th>SD</th>
<th>Delayed posttest M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>More explicit</td>
<td>26</td>
<td>4.42</td>
<td>2.28</td>
<td>6.76</td>
<td>2.98</td>
<td>5.88</td>
<td>3.30</td>
</tr>
<tr>
<td>Less explicit</td>
<td>28</td>
<td>4.42</td>
<td>2.36</td>
<td>7.92</td>
<td>3.02</td>
<td>6.96</td>
<td>3.50</td>
</tr>
<tr>
<td>Baseline</td>
<td>23</td>
<td>3.65</td>
<td>2.53</td>
<td>4.91</td>
<td>3.16</td>
<td>5.08</td>
<td>3.26</td>
</tr>
<tr>
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<td>77</td>
<td>4.19</td>
<td>2.38</td>
<td>6.63</td>
<td>3.25</td>
<td>6.03</td>
<td>3.40</td>
</tr>
</tbody>
</table>

*Note. Total possible score = 10.*

Figure 7. Interpretation scores for new items per condition
A 3x3 ANOVA was performed on new items for Controlled production results (Strict grading) (see Table 18 for Descriptive statistics), and it revealed a main effect for Time, $F(2, 170) = 33.001, p = .00$, partial $\eta^2 = .28$, observed power = 1.00; a main effect for Condition, $F(2, 85) = 5.433, p = .00$, partial $\eta^2 = .113$, observed power = .83, and a significant interaction between Time and Condition, $F(4, 170) = 4.635, p = .00$, partial $\eta^2 = .098$, observed power = .94. In line with the pattern found in previous analyses, the More and Less explicit conditions appeared to perform very similarly at posttest, but the More explicit condition showed a sharper decrease in performance from post to delayed test. The Baseline condition, on the other hand, showed a steady but significant improvement from pre to delayed test, as a Repeated-measures ANOVA
rendered a significant effect for the Baseline condition over time, $F (2, 56) = 3.441, p = .039$, partial $\eta^2 = .109$, observed power = .62. A look at the post-hoc Scheffé analysis indicated that the Less explicit condition clearly outperformed the Baseline group, $p = .01$, as did the More explicit condition, although barely surpassing the significance threshold, $p = .048$. Two One-way ANOVAs to compare these differences at post and delayed tests were subsequently conducted. The first ANOVA rendered a main effect for Condition, $F (2, 85) = 8.261, p = .00$, partial $\eta^2 = .163$, observed power = .96. The post-hoc Scheffé analysis revealed that the More and Less explicit conditions significantly outperformed the Baseline condition at posttest ($p = .003$). The second ANOVA, comparing differences at the delayed test, failed to reach significance, $F (2, 85) = 1.858, p = .16$, partial $\eta^2 = .042$, observed power = .38.

Table 18. Descriptive statistics for the production of new items (Strict scoring)

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest M</th>
<th>Posttest SD</th>
<th>Delayed posttest M</th>
<th>Delayed posttest SD</th>
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</thead>
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<td>3.95</td>
</tr>
<tr>
<td>Less explicit</td>
<td>31</td>
<td>.03</td>
<td>.17</td>
<td>4.48</td>
<td>4.35</td>
<td>3.70</td>
<td>4.29</td>
</tr>
<tr>
<td>Baseline</td>
<td>29</td>
<td>.20</td>
<td>.77</td>
<td>1.00</td>
<td>2.90</td>
<td>1.79</td>
<td>3.23</td>
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<tr>
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<td>.50</td>
<td>3.37</td>
<td>4.15</td>
<td>2.73</td>
<td>3.89</td>
</tr>
</tbody>
</table>

*Note.* Total possible score = 10.

Figure 8. Production scores for new items (Strict grading) per condition
A third and last 3x3 ANOVA was performed on new items for Controlled production results (Lenient grading) (see Table 19 for Descriptive statistics). It yielded a main effect for Time, $F(2, 170) = 35.668, p = .00$, partial $\eta^2 = .296$, observed power = 1.00; a main effect for Condition, $F(2, 85) = 6.080, p = .003$, partial $\eta^2 = .125$, observed power = .88; and a significant interaction between Time and Condition, $F(4, 170) = 5.894, p = .00$, partial $\eta^2 = .122$, observed power = .98. Figure 9 shows a very similar pattern to that found in the previous analysis for new items graded strictly. A look at the post-hoc analysis indicated that the More and Less explicit conditions significantly outperformed the Baseline condition ($p = .027$ and $p = .007$ respectively), which, from Figure 9, appears to happen at posttest. Two One-way ANOVAs were
then run to further elucidate at which point in time this significance took place. The same trend observed with the ANOVAs for new items graded strictly appeared here. The first ANOVA rendered a significant difference among groups, $F(2, 85) = 10.262, p = .00$, partial $\eta^2 = .195$, observed power = .98. The post-hoc analysis showed that the more and Less explicit conditions performed significantly better at posttest than the Baseline condition ($p = .00$ and $p = .002$ respectively). The second ANOVA, in contrast, did not yield a significant difference in performance at the delayed test, $F(2, 85) = 2.040, p = .136$, partial $\eta^2 = .046$, observed power = .41.

Table 19. Descriptive statistics for the production of new items (Lenient grading)

<table>
<thead>
<tr>
<th>Condition</th>
<th>$N$</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Delayed posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
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<tr>
<td>Less explicit</td>
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<td>.06</td>
<td>.24</td>
<td>5.19</td>
</tr>
<tr>
<td>Baseline</td>
<td>29</td>
<td>.34</td>
<td>1.23</td>
<td>1.10</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>.15</td>
<td>.75</td>
<td>4.01</td>
</tr>
</tbody>
</table>

*Note. Total possible score = 10.*

Figure 9. Production scores for new items (Lenient grading) per condition
Table 20. Summary of findings for RQ 1

<table>
<thead>
<tr>
<th></th>
<th>Interpretation</th>
<th>Production (Strict)</th>
<th>Production (Lenient)</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Immediate</td>
<td>Delayed</td>
<td>Immediate</td>
</tr>
<tr>
<td>Total items</td>
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<td>*LE&gt;BL</td>
</tr>
<tr>
<td></td>
<td>*ME&gt;BL</td>
<td>*ME&gt;BL</td>
<td>*ME&gt;BL</td>
</tr>
<tr>
<td>Old items</td>
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<td>New items</td>
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<td>LE&gt;ME&gt;BL</td>
<td>*LE&gt;BL</td>
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<tr>
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<td>ME&gt;BL</td>
<td>*ME&gt;BL</td>
<td>*ME&gt;BL</td>
</tr>
</tbody>
</table>

* p < .05. ME = More explicit  LE = Less explicit  BL = Baseline

**Response to Research Question 2:** Do any of the three types of instructional conditions elicit deeper levels of processing as measured by think-aloud protocols?
In order to respond to RQ2, a non-parametric test, a 3x3 Chi Square (Condition x Level of Processing) was performed to address the frequency of instances of processing per level and per condition (see Table 21 for a detailed count), which rendered a significant result; Chi-square (4)= 36.907, \(p = .00\). Forty-three Think-aloud protocols\(^9\) (More Explicit: 15, Less Explicit: 14, Baseline: 14) produced a total of 504 instances of processing (examples for each of the levels of processing can be seen in Appendix J). As seen in Table 16, the More Explicit condition produced a larger number of instances of deep processing, followed by the Less explicit and by the Baseline conditions. When instances of intermediate processing were compared, the three conditions produced an approximately similar number of instances, with the Less explicit condition producing slightly more than the More explicit and the Baseline groups. With regards to the instances of low processing, the Baseline condition produced more instances than the Less explicit and the More explicit conditions. If the total number of instances of processing, regardless of its depth, is considered, all three conditions appeared to produce a roughly equal amount.

From these numbers, it seems that a more explicit instructional type was related to more instances of deep processing, and as the instructional explicitness decreases, so does the depth of processing, yielding more instances of lower processing.

| Table 21. Number of instances of Processing per level and per Condition. |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|
| Processing                  | Condition       | MoreExplicit    | LessExplicit    | Baseline        | Total           |
| Low                         |                 | 28              | 33              | 58              | 119             |
| Intermediate                |                 | 114             | 121             | 102             | 337             |
| Deep                        |                 | 31              | 12              | 5               | 48              |

\(^9\) Two think-aloud protocols could not be transcribed due to their poor sound quality and were not included in the analyses.
Response to Research Question 3: Is there a relationship between depth of processing, as measured by form-meaning connections in think-aloud protocols during a reading task, and subsequent interpretation and written production of the target form embedded in the reading task?

In order to respond to RQ3, a Generalized Linear Mixed Model analysis was performed using Stata, version 13 (see http://www.stata.com/stata13/). This analysis was conducted with Stata due to the non-independent nature of the data and to the binary coding (1 or 0) of the dependent variables. Prior to running this analysis, an item-by-item (IBI) codification had been conducted for each response provided for old items at the Interpretation and Controlled production posttests. These were coded as either interpreted or not interpreted, and assigned a value of 1 or 0 (variable name: Interpretation IBI); Produced or not produced (Strict grading), and assigned a value of 1 or 0 (variable name: Strict production IBI); and Produced or not produced (Lenient grading), and assigned a value of 1 or 0 (variable name: Lenient production IBI). The think-aloud protocols were then consulted to observe which level of processing (low, intermediate, or deep) participants had reached for each particular instance (variable name: Depth of Processing IBI). There were 421 instances of processing out of a possible total of 430 (43 participants x 10 items). Nine of the instances were not verbalized by participants. As no evidence of processing (at any level) could be extracted from the think-aloud data for those items, they were not included in the analysis. The analysis (see Table 22) yielded a non-significant correlation between Depth of Processing IBI and Interpretation IBI ($b = -.58$, $p = .56$, Confidence Interval= .48 to 1.49); a significant correlation between Depth of Processing IBI and

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10 For more information on this type of analysis, see Hardin and Hilbe (2012).
Strict Production IBI \( (b= 2.47, p= .01, \text{Confidence Interval}= 1.20 \text{ to } 4.82) \), and a non-significant correlation between Depth of Processing IBI and Lenient Production IBI \( (b= 1.59, p= .11, \text{Confidence Interval}= .86 \text{ to } 4.16) \). These findings would indicate that as Depth of Processing increased, it was more likely that participants produced the target form right. However, a deeper processing was not significantly related to a correct interpretation of the target form or to an accurate production when graded leniently.

Table 22. Stata correlations between Depth of Processing and Interpretation and Production of the target form.

<table>
<thead>
<tr>
<th></th>
<th>Coefficient (b)</th>
<th>Standard error</th>
<th>( p )</th>
<th>Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation IBI</td>
<td>-.58</td>
<td>.24</td>
<td>.56</td>
<td>.48 – 1.49</td>
</tr>
<tr>
<td>Strict production IBI</td>
<td>2.47</td>
<td>.85</td>
<td>.01*</td>
<td>1.20 – 4.82</td>
</tr>
<tr>
<td>Lenient production IBI</td>
<td>1.59</td>
<td>.76</td>
<td>.11</td>
<td>.86 – 4.16</td>
</tr>
</tbody>
</table>

Note: * \( p < .05 \)

**Response to Research Question 4:** Is there a relationship between the overall comprehension of a passage and depth of processing of the target form?

In order to respond to RQ4, a two-tailed Pearson correlation was run between participants’ level of processing and comprehension scores. In order to identify each participant’s level of processing, an examination of all instances of processing provided by the participant was conducted, and the most frequently reported level was selected. Overall, six participants (14% of the total) were coded for level 1 (Low); thirty-four (79%) were coded for level 2 (Intermediate), and 3 participants (7%) were coded for level 3 (Deep). The correlation analysis, \( r= .37, p= .013 \) rendered a significant positive relation between the variables: The deeper the processing as revealed by the think-aloud data, the higher the score obtained at the
Response to Research Question 5: Are there differences in the learning and the retention of the Spanish Imperfect subjunctive among L2 learners when their learning style preference (Deductive vs. Inductive) matches or mismatches the instructional condition they have been assigned to?

In order to respond to RQ5, two-tailed Pearson correlations were performed between Learning style preference and scores at Interpretation and Controlled production post and delayed tests in order to account for any type of relation between deductive/inductive preference for learning language rules and performance. For these analyses, the Less explicit and the Baseline conditions were merged into one group. The rationale for this merging is that the Baseline condition could be considered the less explicit type of all three conditions, since participants in this group were exposed to meaningful input containing the target form, but they were not exposed to any type of grammar explanation or hint whatsoever. Therefore, it could be argued that a participant preferring a deductive approach to language rules would mismatch this type of condition, as he would also mismatch the Less explicit condition. On the other hand, that same participant would match either the Less explicit or the Baseline conditions if he preferred an inductive approach to language rules. Table 23 shows how many participants matched or mismatched the experimental condition they were assigned to after merging the Less explicit and the Baseline groups. As can be seen there, most participants in the study showed a preference for a deductive approach to grammar instruction. As a result of this imbalance, many more participants ended up being mismatched when they ended up in one of the two less explicit conditions (less explicit inductive, baseline) through the random assignment to condition implemented in the study.
Table 23. Number of participants matching or mismatching the experimental condition they had been assigned to.

<table>
<thead>
<tr>
<th></th>
<th>Match</th>
<th>Mismatch</th>
</tr>
</thead>
<tbody>
<tr>
<td>More explicit</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Less explicit</td>
<td>7</td>
<td>53</td>
</tr>
</tbody>
</table>

Results for the correlation analyses are shown below in Table 24. Only a significant positive correlation was found between participants in the Less explicit condition and performance at the Interpretation posttest. This correlation also rendered a medium effect size, as indicated by $r \ (0.30)$. As seen in Table 23, most participants’ preference in this group mismatched the type of instruction they received. This would indicate that despite this large mismatch, participants still appeared to perform well at the Interpretation posttest. However, correlations where there was a large match between learning style preference and instruction (e.g., Participants in the More explicit condition) did not turn out to be significant when related to performance at any type of testing immediately or two weeks after treatment.

Table 24. Correlation analyses of Learning style preference and Interpretation and Production results for Immediate and Delayed tests.

<table>
<thead>
<tr>
<th></th>
<th>Interpretation</th>
<th>Production (Strict)</th>
<th>Production (Lenient)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immediate</td>
<td>Delayed</td>
<td>Immediate</td>
</tr>
<tr>
<td>More explicit</td>
<td>$r= -0.02$</td>
<td>$r= 0.091$</td>
<td>$r= 0.002$</td>
</tr>
<tr>
<td>Less explicit</td>
<td>$r= 0.30$</td>
<td>$r= -0.037$</td>
<td>$r= 0.145$</td>
</tr>
<tr>
<td></td>
<td>$p= .02^*$</td>
<td>$p= .78$</td>
<td>$p= .27$</td>
</tr>
</tbody>
</table>

Note: $^*p <.05$
Chapter 5: DISCUSSION AND CONCLUSIONS

Discussion

This section is structured following the format used in the previous chapter. Results for each individual RQ are discussed in light of their contribution to the existing literature in the field of SLA on the variables addressed in the present study. Discussion for RQs 2, 3, and 4 is presented under Depth of Processing. For the reader’s convenience, each RQ is presented again at the beginning of each discussion section.

Discussion for RQ1: Does the type of instructional condition have an immediate effect on L2 learners’ ability to:

a) interpret and produce all exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

b) interpret and produce old exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

c) interpret and produce new exemplars of the Spanish imperfect subjunctive as measured by Interpretation and Controlled production tests?

If so, do these abilities last for two weeks?

Since RQ1 was divided in three different sections, and extensive analyses were performed to address these questions, a summary of the findings will first be presented for the reader’s convenience, before contextualizing them in relation to previous research. Results for RQ1 revealed a main trend that, for the most part, held equally for total, old, and new items, with some differences when contrasting learners’ intake or knowledge, as measured via interpretation and controlled production tests. Starting with the findings rendered by the Interpretation tests, the
More and Less explicit conditions showed significant gains in intake from pretest to posttest. At that point in time, immediately after treatment, both conditions significantly outperformed the Baseline condition. An exception was found for the interpretation of new items, where only the Less explicit condition outperformed the Baseline group in a significant manner, which seems to suggest that learners in the less explicit group were able to generalize the intake to new items. At the delayed test, two weeks after treatment, the More and Less explicit conditions showed a decrease in performance and no significant differences were found among conditions. The Baseline condition, just receiving exposure to meaningful input, showed a steady improvement from pre to delayed test, albeit non-significant.

With regards to knowledge of the target form, as yielded by the Controlled production tests, both the More and Less explicit conditions significantly improved immediately after treatment and outperformed the Baseline condition on all types of items. The main contrasts appear 2 weeks after treatment, where the More explicit and the Less explicit groups experience a decrease in performance while the Baseline group does actually show a steady and significant improvement from pretest to delayed test. At this point in time, 2 weeks after treatment, there is a strong trend towards significance when the performance of the Less explicit condition is compared to the Baseline condition considering all items. This trend becomes statistically significant when comparing processed exemplars present at the experimental task, but not with respect to the generalization of rules to new exemplars. These findings are consistent across total, old and new items regardless of whether accuracy was observed for both mood and tense (strict scoring), or only for mood (lenient scoring).

Some interesting conclusions can be extracted from these findings: 1) It seems that the mere exposure to meaningful input in the absence of any deductive or inductive instructions to
attend to the target structure (for the Baseline group) in a relatively short treatment is sufficient to trigger participants’ intake and knowledge of the Spanish imperfect subjunctive in conditional sentences, and to increase these abilities over time, consolidating their language development; 2) A Less explicit instructional condition, receiving a hint to find the target form, seems to be equally (in the short-term) or more beneficial (in the longer term) for L2 learners of Spanish than a More explicit instructional type, which provided metalinguistic information of the target form prior to practice. This benefit is more pronounced especially two weeks after treatment, at both intake and knowledge of the imperfect subjunctive. 3) With regards to old and new exemplars, different trends are observed for Interpretation and Production tasks. The Less explicit condition seems to be able to generalize the intake of the target form to new items immediately after treatment, as it significantly outperforms the Baseline condition on new items, but appears to have retained the knowledge of the new mood and tense only with old exemplars two weeks after treatment, when compared again to the Baseline condition.

Norris and Ortega (2000) and Spada and Tomita (2010), in their extensive meta-analyses, concluded that explicit instructional conditions were more effective than implicit ones with regards to L2 outcomes. The explicit instructional condition in most of the reviewed studies consisted of explicit grammar information administered prior or during practice. In that sense, the More explicit and the Baseline conditions in the present study would mirror very closely the explicit and implicit conditions reviewed in these two meta-analyses. Present findings suggest that the More explicit condition significantly outperformed the Baseline condition at Posttest, but not at the delayed posttest, at both intake and knowledge levels, except for the intake of new items. These findings would be in line with those reported by Norris and Ortega (2000) and Spada and Tomita (2010), which rendered an overall advantage for the explicit condition over
the implicit condition immediately after treatment. However, the non-significant difference at performance two weeks after treatment would not support the greater significant effect reported for the explicit conditions at delayed testing (Spada & Tomita, 2010). A different picture emerges when we add the Less explicit condition into the equation. Norris and Ortega (2000) consider this condition an “inductive explicit” type of instruction, which would differ from a “pure” implicit type. Other studies (e.g., Robinson, 1996; Rosa & O’Neill, 1999; Erlam, 2003, 2005, Tagarelli et al., 2014) have employed the term ”rule-search”, or “Guided induction” (Herron & Tomasello, 1992), describing it as a more implicit, rather than explicit, type of instruction. Results from the present study would support studies like Herron and Tomasello (1992) or Rosa and O’Neill (1999) in their findings, as the Less explicit condition did not perform in a significantly worse manner than the More Explicit group. Interestingly, it did actually perform better than the More explicit condition at intake of the target form immediately after treatment and at both intake and knowledge of the form two weeks later. Both Herron and Tomasello and Rosa and O’Neill argued that other less explicit treatments might have not revealed any positive effects because they did not emphasize any meaningful practice or a more active hypothesis testing.

Results for the Less explicit condition would be along the lines of Tagarelli et al. (2014) and Sanz et al. (forthcoming). The former found a positive effect for their rule-search condition, which outperformed their incidental condition. Their rule-search condition, similarly to the Less explicit condition in this study, did not receive feedback nor explicit rule presentation prior to practice. Their incidental condition, as the Baseline condition in the present study, also showed a learning effect. The lack of a delayed posttest in their design does not allow us to observe whether the significant difference between intentional and incidental groups was retained over
time. WMC, addressed in their study, was only found to predict performance for the Intentional condition. The latter study, Sanz et al. (forthcoming) did not find significant benefits for the condition receiving pre-practice explicit information when comparing it to a condition where learners were engaged in meaning-focused practice in conjunction with explicit feedback. WMC was found to predict performance for their implicit group, but not for the group receiving pre-practice grammar explanation. At first sight, this finding could seem to contradict Tagarelli et al.’s results with regards to WMC, but Sanz et al. argue that the intentional condition in Tagarelli et al. could actually be considered more implicit than explicit, since it did not receive pre-practice grammar information or explicit feedback, but just instructions to search for a rule. From these two studies, it could be suggested that WMC seems to predict performance when the learning condition leans towards an implicit type, where learners are pushed to rely on their own devices, as the Less explicit condition in the present study.

Current findings would also lend support to a strand of research, Morgan-Short et al. (2010, 2012), that compared explicit and implicit conditions and that examined both behavioral and neural outcomes. As in the present study, Morgan-Short and colleagues found an advantage for the implicit condition for the noun-adjective agreement (2010) and no significant difference in performance between conditions (2012). The authors concluded that providing EI had not appeared to shed any additional benefit. Additionally, their ERP data suggested a more native-like processing pattern for the implicit conditions.

In line with these findings, Sanz and Morgan-Short (2005) posited that the effectiveness of providing explicit information prior to task (understood as grammatical information) would mainly depend on the nature of the task itself. When the input-based task was also task-essential (Loschky & Bley-Vroman, 1993), incorporating meaningful practice, the effect of EI on learning
appeared to diminish or disappear when compared to other conditions that did not include EI (e.g., Rosa & O’Neill, 1999; Benati, 2004; Sanz, 2004; Sanz & Morgan-Short, 2004; Stafford et al., 2012; Sanz et al., forthcoming). Other studies that employed input-based tasks that lacked this *task-essentialness* component, seemed to yield an advantage for the use of EI prior to treatment (e.g., DeKeyser, 1995; Robinson, 1996; Erlam, 2003). The task employed in the present study, following Loschky and Bley-Vroman’s definition, cannot be considered task-essential, since it provided input to participants in a reading passage, but did not engage them in any meaningful practice with that input. Considering this lack of task-essentialness, we could have hypothesized that the More explicit condition receiving metalinguistic information should have rendered a larger positive effect when compared to the other two experimental conditions, and not only to the Baseline group. However, this result was not found.

Rosa and O’Neill (1999) provided a possible explanation suggesting that different types of instruction varying in explicitness might lead to different input processing, with a less explicit type of instruction promoting data-driven (bottom-up) processing, and a more explicit type developing concept-driven (top-down) processing. It could be considered that when participants are basically left *on their own* to try to learn a new grammar form, may actually put in more cognitive effort to process the form when compared to participants provided with the grammatical rule. Additionally, the SDs seen in the Results section, larger for the Less explicit condition, would suggest that benefits for learners at this condition vary more depending on their individual differences. It is important to note that 80% and 84% of DOP instances for the LETA and META fell into the intermediate and deep categories. Hsieh et al. (forthcoming), in line with the present results, found that participants in a less explicit instructional condition processing the problematic *gustar* verb in Spanish performed as well as participants who received the
grammatical explanation for this verb on the immediate posttest and outperformed this explicit group on the delayed posttest. Interestingly, their less explicit condition elicited more cognitive effort during the experimental task and the effect was maintained two weeks later. This amount of cognitive effort could explain why the Less explicit condition in the present study interpreted the target form more accurately than the More explicit condition immediately and two weeks after treatment.

In relation to knowledge of the target form, previous research has indicated that the provision of metalinguistic information (prior and as part of the practice) might facilitate a higher accuracy with a complex form (e.g. VanPatten & Oikkkenon, 1996; Erlam, 2003; Farley, 2004; Rosa & Leow, 2004; Stafford et al., 2012). In this study, the More explicit condition performed better than the Less explicit group, although minimally and non-significantly, and only immediately after treatment, as seen in the accuracy of the posttest scores. However, the Less explicit and the Baseline conditions significantly improved over time, which would entail that the absence of metalinguistic information prior to task does not impede that learners demonstrate a better retention of their productive abilities, as seen especially with the Less explicit condition over time. As Stafford et al. (2012) suggested, leaving participants to their own devices could be the best way for them to induce patterns and develop their own intuitions. It is also very interesting that learning that took place in an input-based treatment without grammar explanation was not only reflected at the intake stage, but also successfully developed into knowledge, as observed at production. Wong (2004) argued that this accomplishment would be evidence of nonnegligible interlanguage change.

With respect to the Less explicit condition knowledge and its retention over time, previous studies have yielded results that support the current findings. Morgan-Short et al.
(2012) found that five months after being trained in Brocanto2, the implicit condition performed as well as the group receiving pre-practice grammar information. Moreover, their ERP data showed more native-like processing mechanisms for participants in the implicit condition. Stafford et al (2012) found that the advantage that the group receiving pre-practice grammar explanation and less explicit feedback showed immediately after treatment vanished three weeks later, not being significantly different from the groups not receiving explicit information. Cox (2013) yielded somehow mixed results. Conditions receiving grammar explanation still showed a positive effect on production two weeks after treatment, but this advantage blurred with older participants, who also showed an increase in their productive abilities in less explicit contexts. DeKeyser (2003) indicated that learning under more implicit (or less explicit) learning conditions results into an implicit knowledge that leads to long-term gains. Since older people rely more on implicit learning mechanisms, and considering DeKeyser (2003), Cox suggested that her observed results for the older group could be expected. From the present results, it seems that the implicit knowledge derived from a less explicit learning condition can be better retrieved by participants two weeks after treatment, rather than from a condition receiving metalinguistic information prior to practice.

Another aspect to consider in the interpretation of results is the complexity of the target form. Farley (2004) and Fernández (2008), unlike other PI studies, posited that the provision of EI prior to practice was useful to learn the present subjunctive, and claimed that for a complex form like this one, EI yielded positive effects when combined with Structured Input. However, in the present study, and despite the complexity of the target form, the provision of a hint to participants to learn the target form seemed to be sufficient to promote the interpretation and the production of the imperfect subjunctive over time. The exposure to metalinguistic information
before treatment did not shed any significant advantage for L2 learners when compared to those just receiving the hint that led them to the clause containing the target form. Additionally, the imperfect subjunctive in this study was not presented in isolation, but within a hypothetical conditional clause structure that was also unknown to participants.

Rosa and Leow (2004), based on Rosa’s unpublished dissertation (1999), targeted the same form as this study, the imperfect subjunctive in conditional clauses, and found an advantage for the explicit treatments over the less explicit treatments. Interestingly, their Control condition received the same treatment as the Baseline condition in this study, mere exposure to the target form in a reading passage. It was significantly outperformed by all experimental conditions, +/- explicit and +/- feedback, on immediate and delayed recognition and production tests. The task-essentialness of its experimental task, a problem-solving task (jigsaw puzzles) that required them to combine a main clause with the appropriate subordinate clause to build conditional clauses, could lead the reader to think that the effect of the explicit conditions would have been minimized. It could be argued that their less explicit groups had a practice of only 18 exemplars and that might have not been enough evidence for participants to induce a rule; but it is important to recall that participants in the present study in the Baseline and Less explicit conditions were only exposed to 12 exemplars in the reading passage. From the findings, it looks like this was enough input to reduce the differences in performance among conditions. Ellis (2002) suggested that limited or very limited instruction addressing a complex structure appeared to be effective in the development of implicit knowledge, as long as the target structure/form was sufficiently available in the input.

In relation to the intake of old exemplars, previous studies (e.g., DeKeyser, 1995; Robinson, 1997; Rosa & Leow, 2004) have posited that the interpretation of old items is made on
the basis of memorization of previous occurrences, finding that most conditions significantly improved regardless of the instruction received. Present findings would be in line with Rosa and Leow (2004), who found that all experimental conditions showed a similar ability to recognize old items, significantly outperforming the Control group, but not with Robinson (1997), whose findings revealed a significant improvement for all conditions.

With regards to the production of old items, it has been claimed that a more explicit type of instruction providing metalinguistic information will likely increase participants’ ability to develop knowledge of the target form, as findings from previous empirical studies suggest (e.g., Ellis, 1993; Alanen, 1995; Robinson, 1997; Wong, 2004; Cox, 2013). These findings would be consistent with the view that memory does not play such an important role as it does with the recognition and interpretation of old exemplars, and learners would additionally need to access some knowledge stored in their developing system to produce the correct form, implying a deeper cognitive effort (VanPatten, 1995). Findings from this study would partially contradict previous results. If we only compare the More explicit and the Baseline conditions, the former outperforms the latter at posttest, but not two weeks after treatment. However, if we consider the condition that just receives a hint to find the target form, it performs similarly or better than the metalinguistic condition at posttest, and, more interestingly, it significantly outperforms the Baseline group at the delayed test, which the metalinguistic condition fails to do. These findings could be explained in light of Ellis (1993), who indicated that learning under more implicit instructional conditions should be slower, and that exposure to many instances of the target form might be necessary to promote L2 development over time. We could argue that the provision of a hint and the exposition during treatment to 12 exemplars of the Spanish imperfect subjunctive
was a number large enough to produce that language development, development that was not found when explicit information prior to practice was added.

The ability for learners to generalize intake and knowledge to new items deserve a different explanation. Previous research has suggested that learners would need of an additional ability to generalize their learning to new exemplars, which could be provided by the addition of metalinguistic information (DeKeyser, 1995; Robinson, 1997; Rosa & Leow, 2004). Present findings seem to contradict the necessity of providing metalinguistic information to accurately interpret or produce new exemplars. The More explicit condition did not outperform significantly neither of the two other conditions in the ability to generalize the intake to new items immediately after treatment or over time. However, the Less explicit condition fared better than the More explicit group at both points in time, and, additionally, it significantly outperformed the Baseline condition at the posttest.

Findings for the generalization of knowledge to new items are somehow more in line with DeKeyser, Robinson, or Rosa and Leow, with the More explicit condition significantly outperforming the Baseline condition at posttest, but not two weeks after treatment. As observed with the production of old items, the Less explicit condition performs as well as the More explicit group right after treatment and better two weeks later. This would imply that the Less explicit condition would not need metalinguistic information to generalize their implicit learning of the imperfect subjunctive to new items and to retain that learning over time. This would seem to contradict Cox (2013), who found an advantage for the provision of explicit information for the production of new items at the delayed posttest. In short, when learners are just provided with a hint and left on their own to figure out the new grammatical pattern seems to significantly trigger their ability to generalize the intake to new items; but it is not sufficient for knowledge to
be generalized in a significant manner. That significant effect, however, does not hold over the course of two weeks.

Discussion on the effects of Processing:

In this section, results that addressed the issue of depth of processing in relation to the instructional conditions (RQ2), to the measurement of intake and knowledge of the target form (RQ3), and to reading comprehension (RQ4) will be discussed.

Discussion for RQ2: Do any of the three types of instructional conditions elicit deeper levels of processing as measured by think-aloud protocols?

Upon evaluation of the results, this question can be answered positively. The More explicit condition yielded more instances of deep processing than the other two conditions. As the instructional explicitness decreased, so did the level of processing of the instances of the target forms, as indicated in the TAs. In other words, participants who received metalinguistic information about the target form were able to provide more instances of deeper processing, such as (in)accurate metalinguistic comments, or correct translations to English of the target form and the conditional structure.

Previous studies addressing the specific relationship between level of processing and different degrees of instructional explicitness in the L2 have not been identified. Most studies tackling depth of processing have found a positive relation between deeper processing and performance (e.g., Hulstijn & Laufer, 2001; Laufer, 2003; Leow et al., 2008; Morgan-Short et al., 2012), but whether that deeper processing was related to a more explicit instructional type remained unaddressed. Within the construct of awareness, some studies have examined this
relation (Rosa & O’Neill, 1999; Rosa & Leow, 2004b). Rosa and O’Neill (1999) found that participants who received explicit information about the target form produced more instances of awareness at the level of understanding than participants in the less explicit condition, but the difference was not significantly different. This difference in instances at the level of understanding did not relate to subsequent performance, as the More explicit condition did not outperform the rule-search condition. Rosa and Leow (2004b) found that participants in their more explicit conditions did report higher levels of awareness, and these levels of awareness were related to higher accuracy at intake and knowledge after task, as the more explicit conditions outperformed the less explicit ones. As the authors put it:

“When only one source of information was available to learners, techniques such as a pre-task or explicit feedback were more effective than implicit feedback in helping learners develop higher and more sophisticated levels of awareness” (p. 286).

In addition to the awareness at the level of understanding, they also found that awareness at the level of noticing still promoted learning, supporting Leow (1997), but contradicting Robinson (1996, 1997). Robinson found that only awareness at the level of understanding promoted learning. Rosa and Leow (2004) argued that the lack of task-essentialness in Robinson’s studies and the different assessment tools used (GJT instead of Interpretation test) could explain that participants in his studies needed to reach a higher level of awareness to show an impact on learning.

Within the limitations of comparing levels of awareness and levels of processing, current findings would be in line with Rosa and O’Neill (1999) and Rosa and Leow (2004b) in that the More explicit condition produced a higher number of instances of deep processing (19 more than the Less explicit condition). However, if we examine these findings in light of the results
discussed for RQ2, this deeper processing extracted from the think-aloud data did not translate in an equal L2 development when compared to the Less explicit group. It could be argued that an intermediate processing, where instances were roughly similar between the two conditions, is sufficient to trigger learning of the target form. The long-term effects of learning under explicit or more implicit conditions could offer an alternative explanation. It was mentioned above that knowledge derived from implicit, or less explicit, learning conditions produces longer-term effects. In contrast, explicit learning conditions effects will hold for the short-term, but will show a decay in the long-term. Participants receiving pre-task grammar information produced the accurate mood and tense equally or slightly better than those not receiving it right after treatment. However, that explicit knowledge of the imperfect subjunctive was not maintained two weeks after treatment. Further evidence was provided by Morgan-Short et al. (2012), which yielded neurolinguistic evidence of a more native-like processing for their implicit condition in the long-term. Whereas this neural evidence cannot be necessarily compared to an intermediate or deep level of processing, it would probably indicate a cognitive effort mechanism more in line with native patterns of processing. More interestingly, if we consider the Baseline condition significant improvement in productive abilities from pretest to delayed test and we take a look at their instances of intermediate processing, 102, not that distant from the 121 (Less explicit) and 114 (More explicit), it could further suggest that processing the target form deeply is not strictly necessary to promote L2 development of the imperfect subjunctive in a conditional clause.

**Discussion for RQ3:** Is there a relationship between depth of processing, as measured by form-meaning connections in think-aloud protocols during a reading task, and subsequent interpretation and written production of the target form embedded in the reading task?
The answer for this question would be negative with respect to the interpretation of the target form, and positive with respect to the production of the target form. In other words, the deeper the processing of a specific target form, the more likely it was for that participant to have gained knowledge of both the subjunctive mood and the imperfect tense. On the contrary, this same likelihood was not observed when measuring the intake of the target form.

Schmidt’s (1993) model of attention in SLA proposed the noticing hypothesis, by which he posited that attention controls access to awareness and is responsible for noticing, which is the necessary condition for the conversion of new input into intake. Robinson (1995) also suggested that awareness is a key element in the subsequent intake and knowledge of a lexical or a grammatical item. Therefore, the input cannot be processed at a minimum level to be fully internalized, but will require a higher cognitive effort by the learner.

Within the construct of awareness, empirical studies have provided evidence to support Schmidt’s hypothesis (Leow, 1997, 2001; Rosa & O’Neill, 1999; Rosa & Leow, 2004). Leow (1997, 2001), at the level of item learning, investigated how different levels of awareness related to the recognition and controlled production of several morphological forms on immediate posttests. Participants who reported higher levels of awareness performed significantly better at gains of intake and knowledge of the new structure. Rosa and O’Neill (1999), only at the level of intake, and Rosa and Leow (2004), for both intake and knowledge, yielded similar trends. Martínez (2010, unpublished dissertation) also found a correlation between levels of awareness and recognition and production of a grammatical target form for both old and new items. The form targeted was the present subjunctive used in adverbial clauses introduced by cuando (when), which, as the target form in the present study, makes reference to an action happening in a hypothetical future.
Very recently, Calderón (2014, unpublished dissertation), within the construct of Depth of processing, found a positive relation between a deeper processing of the grammatical target form, the preterite 3rd person singular, and subsequent knowledge of the form in a Controlled production test. However, she found no relationship with the subsequent intake of the form.

Present findings would be in line with Calderón’s, and would partially support Leow (1997, 2001); Rosa and Leow (2004); and Martínez (2010, unpublished dissertation). In order to explain why this relation has only been found with learners’ productive abilities, we could argue that a deeper level of cognitive effort is necessary to promote successful knowledge of the target form, while in order to intake the latter, a lower level appears to be sufficient. Considering the L2 learning process, where intake of a new form/structure comes at an earlier stage than knowledge of that form, a deeper processing seems to be necessary to transform that intake into knowledge within this learning system. This assumption, however, does not seem to be correlated with the complexity of the target form, since Calderón’s target form (simple), would differ from Martínez and the present study’s target forms (complex). When referring to learners’ productive abilities, it is also revealing to examine the contrast between the accurate production of both mood and tense or just mood. The fact that the relation between deeper levels of processing and the production of the subjunctive mood but not of the right tense did not turn out to be significant could indicate that a lower level of processing is sufficient to produce a quasi-accurate target form (e.g., tú hablara instead of tú hablaras), but a deeper processing will be necessary to produce a total accurate version that combines the right mood and tense. In sum, present findings seem to be in line with previous research that has addressed the relation between higher and deeper levels of awareness and processing, and subsequent measurement of intake and knowledge of the target form.
Discussion for RQ4: Is there a relationship between the overall comprehension of a passage and depth of processing of the target form?

The response for RQ4 would be positive. Deeper levels of processing were correlated with a better comprehension of the reading passage. These findings would be in line with Morgan-Short et al. (2012)\textsuperscript{11}, and Calderón (2014, unpublished dissertation), who found that participants performing a dual task (reading a passage for form and meaning), showed higher comprehension scores when their overall processing had been deeper. Leow et al. (2008), while not making any strong conclusion due to its small sample size, had suggested that the marginal differences found among experimental conditions in their study could be due to the low number of instances of processing reported.

In the field of cognitive psychology, Craik and Lockhart’s (1972) seminal study on levels of processing, revisited by Craik (2002), suggested that deeper levels of processing were necessary for a better “recall” of information. In other words, a deeper processing would entail a better recognition of meaning, while a “shallow” processing, that of surface aspects, would not be sufficiently deep for the participant to recall the meaning he had been exposed to. In SLA, Norris and Ortega (2000) posited that instructional conditions seemed to be more effective when they addressed learners’ attention to both meaning and form rather than just meaning or form alone.

On the other hand, these findings would refute VanPatten’s (2004) Primacy of meaning principle, which stated that L2 learners, when exposed to input, will process meaning rather than

\textsuperscript{11} When comparing present findings with Morgan-Short et al.’s study, it is important to keep in mind that while participants coded for an intermediate level of processing were roughly equal in both studies: 79% and 67% (M-S), those coded for a deep level of processing represented 23% in their study, and only 7% in the present experiment.
form, and that a dual task where attention has to be allocated to both of them will affect negatively the comprehension of the input. It is important to note that the present study, as well as Morgan-Short et al. (2008), and Calderón (2014, unpublished dissertation) provided written input to participants. However, VanPatten (1990) found evidence that supported his principle when input was presented in the aural modality. In that study, attention to both meaning and form decreased participants’ comprehension of the listening passage. Two other studies that replicated VanPatten’s yielded different patterns with respect to the dual task impact on comprehension: Greenslade et al. (1999), in the written modality, found evidence to support VanPatten, while Wong (2001), who presented the input both in the aural and written modalities, supported VanPatten’s results when attending to the aural modality, but rendered support for findings from this study when participants received written input (cf. also Leow et. al., 2008).

Revesz and Brunfaut (2013) also addressed a receptive skill, learners’ listening abilities, and how task characteristics could affect task difficulty. One of these characteristics was syntactic complexity, whose subcategories included subordination and phrasal complexity. Neither of these components was found to predict task difficulty. Keeping in mind the differences between listening and reading modalities, we could argue that syntactic complexity could be the main difficulty of the current experimental task. Participants were exposed to a number of subordinate sentences containing an unknown grammar structure and form. Revesz and Brunfaut added that learners identified syntactic complexity as a clear predictor of task difficulty, which did not correspond with their performance. Based on this, it could be hypothesized that learners would also consider the syntactic complexity of the reading passage with the new target forms embedded in conditional sentences as a main indicator of its task difficulty, and that could be detrimental for their comprehension of the passage, in line with
VanPatten’s argument. However, this was not the case, and Revesz and Brunfaut suggested that participants might have actually allocated a higher cognitive effort to comprehending the meaning of the text in addition to processing and gaining knowledge of the new target form, as they were aware of the presence of new grammatical information in the passage in two of the three instructional conditions.

In sum, it appears that the type of presentation modality of the input (written vs. aural) could play a role in decreasing comprehension, as seen above. However, except for Leow et al. (2008), Morgan-Short et al. (2012), and Calderón (2014, unpublished), no claims or comparisons can be made with the rest of studies with regards to how levels of processing related to comprehension scores, as they did not address the variable of Depth of processing in their designs.

**Discussion for RQ5:** Are there differences in the learning and the retention of the Spanish Imperfect subjunctive among L2 learners when their learning style preference (Deductive vs. Inductive) matches or mismatches the instructional condition they have been assigned to?

The response for RQ5 would be positive. A significant positive correlation was found between a mismatch (participants’ preference for a deductive approach being randomly assigned to the Less explicit condition) and performance at the Interpretation posttest. However, no significance arose when a matching situation was produced (participants with a deductive preference being randomly assigned to the More explicit condition).

Previous studies in Learning styles had addressed the issue of style-matching, but none of them had tackled a grammatical target form comparing different degrees of instructional explicitness with a deductive/inductive style preference. Thus, while no direct comparison can be
made, present findings seem to contradict results from past empirical studies that found a positive effect for matching visual or auditory instructional methods with their corresponding learning style (Farr, 1971; Shen, 2010). On the other hand, other studies found no positive correlation between instructional condition and learning style preference, like Lee (1992) and Pouwels (1992), who also compared visual and auditory styles for L2 vocabulary learning. More recently, Tight (2005), employing a variety of visual conditions, did not find a correlation between any of the conditions and vocabulary learning; and in an extension of the previous study (2010), he found an advantage for a mixed-modality preference (visual, auditory, tactile) immediately after treatment.

In sum, most studies to date have focused on participants’ sensory preferences, which obviously differ from participants’ preference to learn grammar rules in a deductive or inductive way. However, the lack of a significant positive correlation for a matching condition in this study would lend some support to the lack of significant correlations reported in the previous studies.

Peacock (2001) reported that a large percentage of ESL students in Hong Kong, 72%, considered that a mismatch between instruction and learning style preference caused them to get frustrated and explained their lack of academic success. Interestingly, 80% of instructors agreed with students. This statement would be in line with Reid (1995) and with Dornyei (2005), who stated that a mismatching situation could potentially affect learners negatively. Present results seem to refute these statements, showing that learners do actually interpret and produce accurately a grammatical target form despite a mismatch situation.

One possible explanation for these findings resides in the fact that learners might not be aware of the most effective treatment for them to learn a new grammatical form, and they tend to choose the most popular style. That popular style could well be the traditional form of
instruction that presents all grammatical information to L2 learners in the textbook or in a classroom context before engaging learners in any type of practice. As Griffiths (2012, p.161) put it:

“Perhaps more important than popularity is the question of what the relationship between stylistic preferences and effective learning is. It is, after all, possible that a popular style may not be effective in terms of learning outcomes, or that an unpopular style preference may in fact help lead to good results.”

Griffiths arrived at this conclusion after observing that none of the style preferences, popular or unpopular, from 33 ESL students correlated with their final grades in the class. Oxford (2011) argued that despite showing some strong tendencies and being relatively stable, learners’ styles are not “set in stone”, and can vary and render a certain flexibility to adapt to a particular learning context. It could be hypothesized that L2 learners with a deductive preference could have actually adapted their style to the type of learning context (i.e., Less explicit) that they received, with a subsequent positive effect on performance. With regards to the flexibility mentioned by Oxford (2011), Cohen and Dornyei (2002) suggested that it could benefit learners to leave some room for stylistic flexibility in order to maximize learning opportunities. In sum, it looks like Griffiths’ idea with respect to the popularity or lack of popularity of a certain style might very well serve as an explanation for the present findings.

Limitations

As in all empirical studies, this study presents some limitations that need to be considered when interpreting its findings, and, at the same time, these limitations open new paths for future investigation.
First, the lack of reactivity could be due to the highly controlled characteristics of the testing instruments employed, as previous reactivity has been found, for the most part, in less controlled materials. Different testing tools that measure participants’ *free* production, for instance, could be affected positively or negatively by the use of think-aloud protocols. An additional limitation related to verbal protocols is the issue of *veridicality*, or lack of, referring to the omission of information by participants thinking aloud. It cannot be taken for granted that they verbalized every single line of thought. It could also be possible that, at an individual level, some participants whose protocols revealed a lower processing in terms of amount and/or quality did actually perform better than another participant whose processing was actually deeper.

A second limitation is related to the effect that exposure three times to testing materials can have on the learning process, especially for participants at the Baseline condition. While the time between sessions, 2 weeks, and the three versions of the tests would reduce that exposure effect, it cannot be completely ruled out that it added to the gains obtained from exposure to the reading passage meaningful input at treatment.

A third limitation derives from the learning styles correlation analyses and their subsequent interpretation. The fact that a scale was created ranging from a positive to a negative value and then correlated only with a positive value (score) could present a potential validity issue when interpreting the results. Similarly, combining the less explicit and the Baseline conditions in one group resulted in a largely unequal sample size when comparing the deductive and inductive approaches to grammar learning. This could affect the validity and subsequent interpretation of results, as larger sample sizes are statistically more likely to yield significant correlations. Finally, the positive or negative values assigned to each participant’s learning styles translated into a score reflecting a deductive or inductive preference, *excluding* learners that
manifested a strong preference for both approaches, or who slightly leaned towards one of them. Taking all this together, findings for RQ5 should be interpreted with caution, and future investigation on learning styles should build on these limitations to produce finer-grained results.

Finally, preliminary analyses showed that there were not significant differences among conditions before treatment. However, it is important to note the low observed powers, around .20 for each of the tests. Therefore, the possibility that greater differences did not emerge could also be due to a lack of power, probably a result of the low number of participants per group (10-15).

**Future research**

Future research could build on the present findings to further elucidate other aspects that remain to be addressed within the field of SLA. One possibility would be to include more than one grammatical item in the design, differing in the degree of complexity (i.e., imperfect subjunctive vs. imperfect/preterite indicative). This would allow the researcher to probe deeper into how +/- complexity of the target item can impact the findings obtained under different types of instruction, and whether this varying complexity elicits different levels of processing.

Future research could also examine other Learning styles categories, and observe how these interact with the results yielded by the treatment. One of these categories addresses the Field dependence/Field Independence approach to L2 learning (Cohen et al., 2001, 2006). When exposed to a dual task where attention has to be put on both meaning and form, Field-dependent learners are assumed to be better at understanding the overall meaning of a communicative task. Field-independent learners, on the other hand, are expected to be better at inferring grammar rules from that passage (Chapelle, 1995). Whether the L2 learner identifies himself as one type
or the other could predict a better or worse performance at a) Comprehension tests (focus on meaning), and b) Interpretation and Controlled-production tests (focus on the grammatical target item). Analyzing and examining whether these predictions are actually confirmed or unconfirmed could shed more light into the importance of individual differences (i.e. learning styles) and how they relate to learning outcomes.

Future studies could also compare different levels of proficiency to assess whether more or less years of formal exposure to the target language do affect performance at testing under different treatments. Most interestingly, a different level of proficiency could also engage various levels of processing, and a deeper level of processing (i.e., higher cognitive effort) might be elicited by a lower level of proficiency. Finally, as learners’ preference for a deductive or inductive approach to learning L2 grammar rules was used in this study to create a *match* or a *mismatch* with the treatment received, other individual differences (i.e., aptitude, working memory), as suggested by Vatz et al. (2013) could be measured before treatment to create a match/mismatch situation and to observe whether it offers a possible explanation to understand the study’s learning outcomes. Vatz et al. concluded that there is still very limited research that has employed matched-mismatched designs in the SLA field and that more studies are necessary to shed more light into this issue.

**Conclusions**

In addition to addressing the issue of reactivity in this study’s research design, the present study sought to investigate the following: (1) whether different degrees of instructional explicitness had an effect on the interpretation and production of the Spanish imperfect subjunctive in conditional clauses using an input-based experimental task (reading passage) with
the target form embedded in it; (2) whether different levels of processing emerged with different levels of instructional explicitness and whether a deeper processing was correlated with a more accurate performance at the subsequent testing phase; and (3) whether a learner’s preference for a deductive or inductive approach to learning grammar rules correlated with performance at testing after being placed in a condition that matched or mismatched the said learning preference.

The study aimed to address some of the gaps identified in the SLA literature. While research comparing the effectiveness of explicit versus implicit types of instruction with different types of experimental tasks has been extensive, as reviewed in Norris and Ortega (2000) and Spada and Tomita (2010), as well as comparing different degrees of instructional explicitness (e.g., Rosa & O’Neill, 1999; Erlam, 2003; Rosa & Leow, 2004; Stafford et al., 2012), its effects had not been investigated in relation to other variables such as depth of processing, or an individual difference, like Learning styles. Therefore, the present study addressed whether the latter variables could provide an explanation for the results observed as a consequence of the exposure to different instructional types varying in explicitness.

First, results showed that the More and Less explicit conditions significantly improved from pretest to posttest, and then yielded a decrease from posttest to delayed test two weeks later. Findings revealed that they did not outperform significantly each other immediately or two weeks after treatment at either Interpretation or Controlled production tests. Both conditions seemed to perform very similarly at posttest, but the Less explicit condition appeared to maintain higher gains at both intake and knowledge than the More explicit condition two weeks later. The Baseline condition, on the other hand, seemed to benefit from the mere exposure to input, and significantly improved over time in relation to their productive abilities. While being
significantly outperformed by the other two conditions immediately after treatment, that significant difference disappeared two weeks after treatment.

With regards to the measurement of intake and knowledge of old items, the More and Less explicit conditions significantly outperformed the Baseline condition immediately after treatment, but two weeks later it was only at production that the Less explicit condition outperformed the Baseline group. For the interpretation and production of new items, only the Less explicit condition outperformed the Baseline group at posttest for Interpretation results, and both the More and Less explicit conditions outperformed it for production. No significant differences appeared two weeks after treatment.

Overall, these findings would provide some new evidence and cast some doubt over the effectiveness of providing metalinguistic information prior to task considering that: (1) Norris and Ortega (2000) and Spada and Tomita (2010) concluded that an explicit type of instruction was more effective than an implicit type (and the treatment provided by the Less explicit instruction does not differ ostensibly from implicit treatments reviewed by these two meta-analyses; (2) the experimental task was input-based and presented 12 instances of the target form embedded in the passage, but did not engage learners in meaningful practice, which has been shown to diminish the positive effects of providing metalinguistic information prior to task (e.g., Rosa & O’Neill, 1999; Sanz & Morgan-Short, 2004; Stafford et al., 2012); (3) No feedback (+/- explicit) was included in the design of the study (during or post-treatment), which has been shown to reduce any differences created by the provision of instruction prior to task and to level the field among conditions (Li, 2010); and (4) the target form addressed in the study, the imperfect subjunctive in conditional clauses, reveals a high complexity, and previous studies addressing the subjunctive have yielded a beneficial role for the addition of metalinguistic
information prior to experimental task. It seemed that the provision of a hint to learners to try to figure out the target form together with the exposure to meaningful input where the target form was embedded was sufficient to trigger an accurate interpretation and production of the target form over time.

Second, results on processing yielded instances of deeper processing for the More explicit condition, and this processing became more shallow as the instructional explicitness decreased. When compared to the performance yielded by each condition, it could be suggested that reaching an intermediate level of processing might be sufficient to trigger learning of the target form. Additionally, deeper processing was positively correlated with a subsequent accurate performance at production (but not interpretation), and higher scores at comprehension. The latter findings would support previous studies that also found a positive correlation between deeper levels of processing and post-task performance at comprehension (e.g., Morgan-Short et al., 2012; Calderón, 2014, unpublished) and at Controlled production (Calderón, 2014, unpublished).

Third, the analysis of participants’ learning styles in relation to their performance rendered a significant correlation with performance at interpretation immediately after treatment but only when a mismatch between style preference and instructional condition had been observed. However, as noted in the Limitations section, caution is necessary when interpreting these findings. On the other hand, a matching situation did not render any positive relation with performance. These findings would somehow contradict Reid (1995), Peacock (2001), or Dornyei (2005), who had claimed that a style matching the type of instruction received would benefit the L2 learner and its subsequent performance. However, as suggested by Griffiths
(2012), a feasible explanation could be that the most popular style (i.e., receiving a detailed grammar explanation) would not necessarily relate to better performance.

In sum, a feasible line of argumentation to explain the Less explicit condition performance could lie in the quality of its processing. It appears that the hint provided pushed them to process the target form to an extent that is not different from that of the more explicit condition at the intermediate level of processing. In line with the results reported in Hsieh et al. (forthcoming), processing may explain why the Less explicit condition retained the information two weeks after treatment more accurately than the more explicit group. This argumentation for the importance of depth of processing gains special relevance when we consider that the learning style preference of participants in the Less explicit conditions mismatched the treatment received.

Overall, this is the first study that has brought together the three variables addressed (i.e., degrees of Instructional explicitness, Depth of Processing, and Learning styles (with a focus on deductive/inductive preference)), rendering some interesting findings as to how the last two can explain the findings of the first one. These findings contribute to the extensive literature published on instructional types from two very different angles.
Appendix A

Instructions for participants in the more explicit condition

You are going to read a passage in Spanish and then you will be asked some questions in English to see how well you understood the passage. You will be asked to think aloud while you read the passage (as you did in the practice exercise). Also, there is a new structure in the passage that you haven’t learned in class yet. So, I will explain it to you.

The new structure is called “past subjunctive” and it is used in hypothetical (contrary-to-fact) situations. It is formed by taking the stem from the third-person plural form of the preterite minus –on.

So, if the third-person plural form of the preterite of hablar is hablaron, we would eliminate -on and have hablar-. We would add the past-subjunctive endings -a, -as, -a, -amos, -ais, -an, and we would have the following forms:

<table>
<thead>
<tr>
<th>hablara</th>
<th>habláramos</th>
</tr>
</thead>
<tbody>
<tr>
<td>hablaras</td>
<td>hablarais</td>
</tr>
<tr>
<td>hablara</td>
<td>hablaran</td>
</tr>
</tbody>
</table>

When we have a situation that is perceived as hypothetical (contrary to fact), the past subjunctive is used in the if clause (or hypothetical clause) and the conditional is used in the result clause (or main clause). The clauses can occur in either order. Observe the following sentences:

Si tú participaras más en clase, recibirías una nota más alta.

Juan se graduaría en mayo si aprobara la clase de español.

Ok, now we are ready. You are going to read the passage in Spanish where this new structure I have just explained to you will appear several times, and then you will answer some comprehension questions in English based on the text. And remember you have to think aloud while you read the passage!

Good luck!
Appendix B

Instructions for participants in the less explicit condition

You are going to read a passage in Spanish and then you will be asked some questions in English to see how well you understood the passage. You will be asked to think aloud while you read the passage. Also, there is a new structure in the passage that you haven’t learned in class yet. So your goal will be to try to figure out the rule.

You will see it several times throughout the passage. Your goal is to figure out the grammar rule or rules for that structure. Paying attention to the sentences that contain a *si* clause might help you!

Ok, now we are ready. You are going to read the passage in Spanish, and then you will answer some comprehension questions in English based on the text. And remember you have to think aloud while you read the passage!

Good luck!
Appendix C

Instructions for control participants

You are going to read a passage in Spanish and then you will be asked some questions in English to see how well you understood the passage. You will be asked to think aloud while you read the passage.

Ok, now we are ready. You are going to read the passage in Spanish, and then you will answer some comprehension questions in English based on the text. And remember you have to think aloud while you read the passage!

Good luck!
Appendix D

Estudiar mejor: Claves del éxito

Texto adaptado de: http://centros5.pntic.mec.es/ies.de.bullas/revista/estudiar.htm

La sabiduría popular dice que el éxito en la vida depende de dos ingredientes: inteligencia y ganas de triunfar, pero que el primero fracasa sin el segundo: lo importante es la voluntad. Los expertos en educación añaden que si no se motivara a los estudiantes lo suficiente, sólo su inteligencia no bastaría para tener éxito. Cualquier ser humano que sepa leer es capaz de aprender, pero aprendería más rápido si trabajara con más esfuerzo. Es cierto que algunas personas parecen haber nacido dotadas para el estudio, ya que asimilan y retienen los datos más rápidamente que otras, pero en general aprender es, simplemente, una cuestión de disciplina. Incluso un superdotado físico no conseguiría ni un triunfo deportivo si no entrenara muchas horas cada día. Aprender es sencillo, sólo hay que proponérselo. Y para empezar, nada mejor que establecer cuáles son tus prioridades.

"Mens sana in corpore sano". Cerebro y cuerpo forman el mismo conjunto, y cuando estás enfermo o débil pierdes capacidad para pensar. Si cuidaras tu salud, sería más fácil concentrarte en los estudios. Del mismo modo, serías más productivo si practicaras ejercicio físico de manera regular. De igual manera, si descansaras una media de 8 horas, tu cerebro se fortalecería y procesaría mejor la información.

El primer paso al disponerte a estudiar es motivarte, poner toda tu energía en el empeño de aprender. Estructurarías mejor tu aprendizaje si te marcaras unos objetivos a corto plazo. Ten un buen nivel de autoestima: incluso si alguna asignatura te causara dificultades, deberías confiar en ti. Fortalece tu sentido de superación: Si te preocupara no mejorar con rapidez, deberías pensar en las ventajas de tu esfuerzo. Cada día, al ponerte a estudiar, repasa lo aprendido el día anterior, y comprobarás lo que realmente has avanzado. Concéntrate poniendo los cinco sentidos en el estudio. Si no controlaras tus emociones, podrían restarte energía y concentración, como la tensión, la angustia y la ansiedad. Supéralas relajando tu cuerpo.

Es importante estudiar siempre en el mismo sitio porque la familiaridad con el entorno ayuda. Crea tu propio espacio cerca de una ventana, instala una mesa.
grande para distribuir apuntes, libros... Si estudiaras cada día en un sitio diferente, te distraerías con mucha facilidad. Es importante el orden en tu mesa para que no pierdas el tiempo. Finalmente, el frío impide concentrarse y el calor produce agotamiento, por lo que lo ideal es conseguir unos 64 o 68 grados. Te costaría mucho concentrarte si la temperatura cambiara con mucha frecuencia.
Appendix E

Learning Style Survey*:
Assessing Your Own Learning Styles

Andrew D. Cohen, Rebecca L. Oxford, and Julie C. Chi

The Learning Style Survey is designed to assess your general approach to learning. It does not predict your behavior in every instance, but it is a clear indication of your overall style preferences. For each item, circle the response that represents your approach. Complete all items. There are eleven major activities representing twelve different aspects of your learning style. When you read the statements, try to think about what you generally do when learning. It generally takes about 30 minutes to complete the survey. Do not spend too much time on any item – indicate your immediate feeling and move on to the next item.

For each item, circle your response:

0 = Never
1 = Rarely
2 = Sometimes
3 = Often
4 = Always

Part 1: HOW I USE MY PHYSICAL SENSES

1. I remember something better if I write it down. 0 1 2 3 4
2. I take detailed notes during lectures. 0 1 2 3 4
3. When I listen, I visualize pictures, numbers, or words in my head. 0 1 2 3 4
4. I prefer to learn with TV or video rather than other media. 0 1 2 3 4
5. I use color-coding to help me as I learn or work. 0 1 2 3 4
6. I need written directions for tasks. 0 1 2 3 4
7. I have to look at people to understand what they say. 0 1 2 3 4
8. I understand lectures better when professors write on the board. 0 1 2 3 4
9. Charts, diagrams, and maps help me understand what someone says. 0 1 2 3 4
10. I remember peoples’ faces but not their names. 0 1 2 3 4
Learning Style Survey: Assessing Your Own Learning Styles

A - Total

11. I remember things better if I discuss them with someone.
   0 1 2 3 4

12. I prefer to learn by listening to a lecture rather than reading.
   0 1 2 3 4

13. I need oral directions for a task.
   0 1 2 3 4

14. Background sound helps me think.
   0 1 2 3 4

15. I like to listen to music when I study or work.
   0 1 2 3 4

16. I can understand what people say even when I cannot see them.
   0 1 2 3 4

17. I remember peoples’ names but not their faces.
   0 1 2 3 4

18. I easily remember jokes that I hear.
   0 1 2 3 4

19. I can identify people by their voices (e.g., on the phone).
   0 1 2 3 4

20. When I turn on the TV, I listen to the sound more than I watch the screen.
   0 1 2 3 4

B - Total

21. I’d rather start to do things, rather than pay attention to directions.
   0 1 2 3 4

22. I need frequent breaks when I work or study.
   0 1 2 3 4

23. I need to eat something when I read or study.
   0 1 2 3 4

24. If I have a choice between sitting and standing, I’d rather stand.
   0 1 2 3 4

25. I get nervous when I sit still too long.
   0 1 2 3 4

26. I think better when I move around (e.g., pacing or tapping my feet).
   0 1 2 3 4

27. I play with or bite on my pens during lectures.
   0 1 2 3 4
28. Manipulating objects helps me to remember what someone says. 0 1 2 3 4
29. I move my hands when I speak. 0 1 2 3 4
30. I draw lots of pictures (doodles) in my notebook during lectures. 0 1 2 3 4

C -Total

Part 2: HOW I EXPOSE MYSELF TO LEARNING SITUATIONS

1. I learn better when I work or study with others than by myself. 0 1 2 3 4
2. I meet new people easily by jumping into the conversation. 0 1 2 3 4
3. I learn better in the classroom than with a private tutor. 0 1 2 3 4
4. It is easy for me to approach strangers. 0 1 2 3 4
5. Interacting with lots of people gives me energy. 0 1 2 3 4
6. I experience things first and then try to understand them. 0 1 2 3 4

A -Total

7. I am energized by the inner world (what I’m thinking inside). 0 1 2 3 4
8. I prefer individual or one-on-one games and activities. 0 1 2 3 4
9. I have a few interests, and I concentrate deeply on them. 0 1 2 3 4
10. After working in a large group, I am exhausted. 0 1 2 3 4
11. When I am in a large group, I tend to keep silent and listen. 0 1 2 3 4
12. I want to understand something well before I try it. 0 1 2 3 4

B -Total

Part 3: HOW I HANDLE POSSIBILITIES
1. I have a creative imagination. 0 1 2 3 4
2. I try to find many options and possibilities for why something 0 1 2 3 4 happens.
3. I plan carefully for future events. 0 1 2 3 4
4. I like to discover things myself rather than have everything 0 1 2 3 4 explained to me.
5. I add many original ideas during class discussions. 0 1 2 3 4
6. I am open-minded to new suggestions from my peers. 0 1 2 3 4

A -Total

7. I focus in on a situation as it is rather than thinking about how 0 1 2 3 4 it could be.
8. I read instruction manuals (e.g., for computers or VCRs) before 0 1 2 3 4 using the device.
9. I trust concrete facts instead of new, untested ideas. 0 1 2 3 4
10. I prefer things presented in a step-by-step way. 0 1 2 3 4
11. I dislike it if my classmate changes the plan for our project. 0 1 2 3 4
12. I follow directions carefully. 0 1 2 3 4

B -Total

Part 4: HOW I DEAL WITH AMBIGUITY AND WITH DEADLINES

1. I like to plan language study sessions carefully and do lessons 0 1 2 3 4 on time or early.
2. My notes, handouts, and other school materials are carefully 0 1 2 3 4 organized.
3. I like to be certain about what things mean in a target language. 0 1 2 3 4
4. I like to know how rules are applied and why. 0 1 2 3 4

A - Total

5. I let deadlines slide if I’m involved in other things. 0 1 2 3 4
6. I let things pile up on my desk to be organized eventually. 0 1 2 3 4
7. I don’t worry about comprehending everything. 0 1 2 3 4
8. I don’t feel the need to come to rapid conclusions about a topic. 0 1 2 3 4

B - Total

Part 5: HOW I RECEIVE INFORMATION

1. I prefer short and simple answers rather than long explanations. 0 1 2 3 4
2. I ignore details that do not seem relevant. 0 1 2 3 4
3. It is easy for me to see the overall plan or big picture. 0 1 2 3 4
4. I get the main idea, and that’s enough for me. 0 1 2 3 4
5. When I tell an old story, I tend to forget lots of specific details. 0 1 2 3 4

A - Total

6. I need very specific examples in order to understand fully. 0 1 2 3 4
7. I pay attention to specific facts or information. 0 1 2 3 4
8. I’m good at catching new phrases or words when I hear them. 0 1 2 3 4
9. I enjoy activities where I fill in the blank with missing words I hear. 0 1 2 3 4
10. When I try to tell a joke, I remember details but forget the punch line. 0 1 2 3 4
Part 6: HOW I FURTHER PROCESS INFORMATION

1. I can summarize information easily.
0 1 2 3 4

2. I can quickly paraphrase what other people say.
0 1 2 3 4

3. When I create an outline, I consider the key points first.
0 1 2 3 4

4. I enjoy activities where I have to pull ideas together.
0 1 2 3 4

5. By looking at the whole situation, I can easily understand someone. 0 1 2 3 4

Learning Style Survey: Assessing Your Own Learning Styles 3

6. I have a hard time understanding when I don’t know every word. 0 1 2 3 4
7. When I tell a story or explain something, it takes a long time.
0 1 2 3 4
8. I like to focus on grammar rules.
0 1 2 3 4
9. I’m good at solving complicated mysteries and puzzles.
0 1 2 3 4
10. I am good at noticing even the smallest details regarding some task. 0 1 2 3 4

Part 7: HOW I COMMIT MATERIAL TO MEMORY

1. I try to pay attention to all the features of new material as I learn. 0 1 2 3 4
2. When I memorize different bits of language material, I can retrieve these bits easily – as if I had stored them in separate slots in my brain.
3. As I learn new material in the target language, I make fine distinctions among speech sounds, grammatical forms, and words and phrases.
0 1 2 3 4

4. When learning new information, I may clump together data by eliminating or reducing differences and focusing on similarities.
5. I ignore distinctions that would make what I say more accurate in the given context.
6. Similar memories become blurred in my mind; I merge new learning experiences with previous ones.
Part 8: HOW I DEAL WITH LANGUAGE RULES

1. I like to go from general patterns to the specific examples in learning a target language.
2. I like to start with rules and theories rather than specific examples.
3. I like to begin with generalizations and then find experiences that relate to those generalizations.

Part 9: HOW I DEAL WITH MULTIPLE INPUTS

1. I can separate out the relevant and important information in a given context even when distracting information is present.
2. When I produce an oral or written message in the target language, I make sure that all the grammatical structures are in agreement with each other.
3. I not only attend to grammar but check for appropriate level of formality and politeness.

Part 10: HOW I DEAL WITH RESPONSE TIME
1. I react quickly in language situations. 0 1 2 3 4
2. I go with my instincts in the target language. 0 1 2 3 4
3. I jump in, see what happens, and make corrections if needed. 0 1 2 3 4
   A - Total

4. I need to think things through before speaking or writing. 0 1 2 3 4
5. I like to look before I leap when determining what to say or write in a target language.
6. I attempt to find supporting material in my mind before I set about producing language.
   B - Total

Part 11: HOW LITERALLY I TAKE REALITY

1. I find that building metaphors in my mind helps me deal with language (e.g., viewing the language like a machine with component parts that can be disassembled).
2. I learn things through metaphors and associations with other things. I find stories and examples help me learn.
   A - Total

3. I take learning language literally and don’t deal in metaphors. 0 1 2 3 4
4. I take things at face value, so I like language material that says what it means directly.
   B - Total

Learning Style Survey: Assessing Your Own Learning Styles 5
Understanding your totals

Once you have totaled your points, write the results in the blanks below. Circle the higher number in each part (if they are close, circle both). Read about your learning styles starting below.

Part 1: Part 5: Part 9:
A ___ Visual A ___ Global A ___ Field-Independent
B ___ Auditory B ___ Particular B ___ Field-Dependent
C ___ Tactile / Kinesthetic

Part 2: Part 6: Part 10:
A ___ Extraverted A ___ Synthesizing A ___ Impulsive
B ___ Introverted B ___ Analytic B ___ Reflective

Part 3: Part 7: Part 11:
A ___ Random-Intuitive A ___ Sharpener A ___ Metaphoric
B ___ Concrete-Sequential B ___ Leveler B ___ Literal

Part 4: Part 8:
A ___ Closure-Oriented A ___ Deductive
B ___ Open B ___ Inductive

Note:

Before reading the next section, understand that this is only a general description of your learning style preferences. It does not describe you all of the time, but gives you an idea of your tendencies when you learn. Note that in some learning situations, you may have one set of style preferences and in a different situation, another set of preferences. Also, there are both advantages and disadvantages to every style preference.

If on the sensory style preferences (visual, auditory, tactile/kinesthetic) you prefer two or all three of these senses (i.e., your totals for the categories are within five points or so), you are likely to be flexible enough to enjoy a wide variety of activities in the language classroom. On the other dimensions, although they appear to be in opposition, it is possible for you to have high scores on both, meaning that you do not have a preference one way or the other. Here are three examples: on the extroverted-introverted distinction, you are able to work effectively with others as well as by yourself; on the closure-open distinction, you enjoy the freedom of limited structure and can still get the task done before the deadline without stress; on the global-particular distinction, you can handle both the gist and the details easily.

Furthermore, learning style preferences change throughout your life, and you can also stretch them, so don’t feel that you are constrained to one style.

Part 1: HOW I USE MY PHYSICAL SENSES

If you came out as more visual than auditory, you rely more on the sense of sight, and you learn best through visual means (books, video, charts, pictures). If you are more auditory in preference, you prefer listening and speaking activities (discussions, lectures, audio tapes, role-plays). If you have a tactile/kinesthetic style preference, you benefit from doing projects, working with objects, and moving around (games, building models, conducting experiments).

6 Maximizing Study Abroad
Part 2: HOW I EXPOSE MYSELF TO LEARNING SITUATIONS

If you came out more extraverted on this survey, you probably enjoy a wide range of social, interactive learning tasks (games, conversations, discussions, debates, role-plays, simulations). If you came out more introverted, you probably like to do more independent work (studying or learning with a computer) or enjoy working with one other person you know well.

Part 3: HOW I HANDLE POSSIBILITIES

If you scored more random-intuitive, you are most likely more future-oriented, prefer what can be over what is, like to speculate about possibilities, enjoy abstract thinking, and tend to disfavor step-by-step instruction. If your style preference was more concrete-sequential, you are likely to be more present-oriented, prefer one-step-at-a-time activities, and want to know where you are going in your learning at every moment.

Part 4: HOW I APPROACH TASKS

If you are more closure-oriented, you probably focus carefully on most or all learning tasks, strive to meet deadlines, plan ahead for assignments, and want explicit directions. If you are more open in your orientation, you enjoy discovery learning (in which you pick up information naturally) and prefer to relax and enjoy your learning without concern for deadlines or rules.

Part 5: HOW I RECEIVE INFORMATION

If you have a more global style preference, you enjoy getting the gist or main idea and are comfortable communicating even if you don’t know all the words or concepts. If you are more particular in preference, you focus more on details and remember specific information about a topic well.

Part 6: HOW I FURTHER PROCESS INFORMATION

If you are a synthesizing person, you can summarize material well, enjoy guessing meanings and predicting outcomes, and notice similarities quickly. If you are analytic, you can pull ideas apart and do well on logical analysis and contrast tasks, and you tend to focus on grammar rules.

Part 7: HOW I COMMIT MATERIAL TO MEMORY

If you are a sharpener, you tend to notice differences and seek distinctions among items as you commit material to memory. You like to distinguish small differences and to separate memory of prior experiences from memory of current ones. You can easily retrieve the different items because you store them separately. You like to make fine distinctions among speech sounds, grammatical forms, and meaningful elements of language (words and phrases). If you are a leveler, you are likely to clump material together in order to remember it, by eliminating or reducing differences, and by focusing almost exclusively on similarities. You are likely to blur similar memories and to merge new experiences readily with previous ones. If you are concerned about accuracy and getting it all right, then the sharpener approach is perhaps preferable. If you are concerned about expediency, then being a leveler may be the key to communication.

Part 8: HOW I DEAL WITH LANGUAGE RULES

If you are a more deductive learner, you like to go from the general to the specific, to apply generalizations to experience, and to start with rules and theories rather than with specific examples. If you are a more inductive learner, you like to go from specific to general and prefer to begin with
examples rather than rules or theories.

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Part 9: HOW I DEAL WITH MULTIPLE INPUTS

If you are more field-independent in style preference, you like to separate or abstract material from within a given context, even in the presence of distractions. You may, however, have less facility dealing with information holistically. If you are more field-dependent in preference, you tend to deal with information in a more holistic or “gestalt” way. Consequently you may have greater difficulty in separating or abstracting material from its context. You work best without distractions.

Part 10: HOW I DEAL WITH RESPONSE TIME

If you are a more impulsive learner, you react quickly in acting or speaking without thinking the situation through. For you, thought often follows action. If you are a more reflective learner, you think things through before taking action and often do not trust your gut reactions. In your case, action usually follows thought.

Part 11: HOW LITERALLY I TAKE REALITY

If you are a metaphoric learner, you learn material more effectively if you conceptualize aspects of it, such as the grammar system, in metaphorical terms. You make the material more comprehensible by developing and applying an extended metaphor to it (e.g., visualizing the grammar system of a given language as an engine that can be assembled and disassembled). If you are a literal learner, you prefer a relatively literal representation of concepts and like to work with language material more or less as it is on the surface.

Tips for the learner

Each style preference offers significant strengths in learning and working. Recognize your strengths to take advantage of ways you learn best. Also, enhance your learning and working power by being aware of and developing the style areas that you do not normally use. Tasks that do not seem quite as suited to your style preferences will help you stretch beyond your ordinary comfort zone, expanding your learning and working potential.

For example, if you are a highly global person, you might need to learn to pay more attention to detail in order to learn more effectively. If you are an extremely detail-oriented person, you might be missing out on some useful global characteristics, like getting the main idea quickly. You can develop such qualities in yourself through practice. You won’t lose your basic strengths by trying something new; you will simply develop another side of yourself that is likely to be very helpful to your language learning.

If you aren’t sure how to attempt new behaviors that go beyond your favored style, then ask your colleagues, friends, or teachers to give you a hand. Talk with someone who has a different style from yours and see how that person does it. Improve your learning or working situation by stretching your style!

*Author’s Note: The format of the Learning Styles Survey and a number of the dimensions and items are drawn from Oxford’s Style Analysis Survey, 1995, in J. Reid (Ed.), Learning styles in the ESL/EFL classroom (pp. 208-215). Boston: Heinle & Heine/Thomson International. Other key dimensions and some of the wording of items comes from Ehrman and Leaver’s E&L Questionnaire, 2001. For more information on this questionnaire, see the Resources Section of this Guide
Appendix F

Interpretation test

You are going to read some situations and then you will need to select the option that better describes it.

1. Pablo is a senior in high school and he is not sure he wants to attend college. He should consider doing something different if he is not very motivated.
   a) Si a Pablo no le motivara asistir a la universidad, debería hacer algo diferente.  
   b) Si a Pablo no le motivaría asistir a la universidad, debería hacer algo diferente.  
   c) Si a Pablo no le motivaba asistir a la universidad, debería hacer algo diferente.

2. Juan is a disciplined student who goes to class every day. However, he is not that disciplined when it comes to doing his homework and his results are not that good.
   a) Juan conseguiría mejores resultados si trabajaba con más regularidad.  
   b) Juan conseguiría mejores resultados si trabajara con más regularidad.  
   c) Juan conseguiría mejores resultados si trabajará con más regularidad.

3. María is a physically-gifted athlete at Georgetown, and she trains with less intensity than her teammates. She knows she needs to train harder to win more races.
   a) Si María entrenaría más, ganaría más carreras.  
   b) Si María entrenó más, ganaría más carreras.  
   c) Si María entrenara más, ganaría más carreras.

4. You do not take very good care of your health, and get sick quite often. You are aware that taking better care of your health would boost your academic performance.
   a) Mejorarías tu rendimiento académico si cuidarás tu salud.  
   b) Mejorarías tu rendimiento académico si cuidaras tu salud.  
   c) Mejorarías tu rendimiento académico si cuidaste tu salud.

5. You used to do exercise every day. Nowadays, you barely do any exercise and feel very tired. You wish you could do more exercise to have more energy.
   a) Si practicaras ejercicio físico con frecuencia, serías más productiva.  
   b) Si practicabas más ejercicio físico con frecuencia, serías más productiva.  
   c) Si practicarás más ejercicio físico con frecuencia, serías más productiva.

6. You do not sleep more than 5-6 hours at night, and as a result you are tired all day long. You know that being able to sleep more hours is good for your productivity.
a) Procesarías mejor la información si lograras dormir más horas.
b) Procesarías mejor la información si lograrías dormir más horas.
c) Procesarías mejor la información si lograras dormir más horas.

7. María has a low self-esteem because she is struggling in some of her courses. A higher confidence in herself is very important for her to succeed.

a) María debería tener más confianza si alguna asignatura le causaba dificultades.
b) María debería tener más confianza si alguna asignatura le causará dificultades.
c) María debería tener más confianza si alguna asignatura le causara dificultades.

8. Roberto works very hard on his courses but with little improvement, which worries him. He knows that being more positive will be better for him.

a) Si a Roberto le preocuparía mejorar muy despacio, debería ser más positivo.
b) Si a Roberto le preocupara mejorar muy despacio, debería ser más positivo.
c) Si a Roberto le preocupó mejorar muy despacio, debería ser más positivo.

9. You normally get very tense and anxious before finals. Your advisor recommended you to do some relaxation exercises to increase your concentration.

a) Aumentarías tu concentración si controlaras tus emociones.
b) Aumentarías tu concentración si controlarás tus emociones.
c) Aumentarías tu concentración si controlabas tus emociones.

10. You love studying at different places, at home, at the library, at the cafeteria, but you do not know it actually distracts you even more than studying at one place.

a) Si estudiaras en el mismo lugar todos los días, no te distraerías tanto.
b) Si estudiaste en el mismo lugar todos los días, no te distraerías tanto.
c) Si estudiarias en el mismo lugar todos los días, no te distraerías tanto.

11. Mario is considering dropping out of school because he does not like studying, even if he knows he could regret it in the future.

a) Mario tendría problemas en el futuro si dejaría los estudios.
b) Mario tendría problemas en el futuro si dejará los estudios.
c) Mario tendría problemas en el futuro si dejara los estudios.

12. You do not have a Facebook or Twitter account, but you know you need to open one if you want to stay in touch with many people.

a) Si no te adaptaras a las nuevas tecnologías, permanecerías en el pasado.
b) Si no te adaptabas a las nuevas tecnologías, permanecerías en el pasado.
c) Si no te adaptaste a las nuevas tecnologías, permanecerías en el pasado.

13. Pablo might abandon that research project because he has run out of funds. However, he is aware of its importance for his research career.

a) Su carrera de investigación peligraría si abandonara el proyecto de investigación.
b) Su carrera de investigación peligraría si abandonó el proyecto de investigación.
c) Su carrera de investigación peligraría si abandonará el proyecto de investigación.

14. You always forget to clean your room, which gets your mother quite upset, and you know you should clean it more often.

a) Si no olvidaste limpiar tu habitación, tu madre no se enfadaría.
b) Si no olvidaras limpiar tu habitación, tu madre no se enfadaría.
c) Si no olvidabas limpiar tu habitación, tu madre no se enfadaría.

15. María wants to announce to her parents her marriage with Luis very soon. She knows they will be very surprised when they know.

a) Sus padres estarían sorprendidos si María anunciara su boda con Luis.
b) Sus padres estarían sorprendidos si María anunciará su boda con Luis.
c) Sus padres estarían sorprendidos si María anunció su boda con Luis.

16. You know that not finishing that project in May means that it will keep you busy all summer long.

a) Si terminarias tu proyecto en mayo, tendrías todo el verano libre.
b) Si terminabas tu proyecto en mayo, tendrías todo el verano libre.
c) Si terminaras tu proyecto en mayo, tendrías todo el verano libre.

17. People speak very loudly at María’s favorite restaurant, which makes it hard for Luis to hear what she is saying.

a) Luis podría escuchar a María si la gente hablara más bajo.
b) Luis podría escuchar a María si la gente hablaría más bajo.
c) Luis podría escuchar a María si la gente hablará más bajo.

18. You barely eat anything for breakfast, just some cereal, and you feel very tired during your soccer practice. Having a bigger breakfast could probably help you.

a) Si tomaras un desayuno más grande, entrenarías mejor a fútbol.
b) Si tomas un desayuno más grande, entrenarías mejor a fútbol.
c) Si tomaste un desayuno más grande, entrenarías mejor a fútbol.
19. Juan never travels anywhere and spends his holidays at home with his family. Pablo told him that traveling is a good way to learn about new cultures.

a) Juan descubriría nuevas culturas si viajaría a otros países.
b) Juan descubriría nuevas culturas si viajara a otros países.
c) Juan descubriría nuevas culturas si viajaba a otros países.

20. You are always late to class because you are waiting for your roommate to be ready. You know that you could make it on time if you did not have to wait for your roommate.

a) Si no esperarás a tu compañero, llegarías temprano a clase.
b) Si no esperarías a tu compañero, llegarías temprano a clase.
c) Si no esperaras a tu compañero, llegarías temprano a clase.
Appendix G

Controlled written production test

1. The Spanish instructor knows he needs to motivate Pablo more so that he is able to pass his exams in May.

Si el profesor no (MOTIVAR) _________________ a Pablo, éste no aprobaría los exámenes.

2. Luis has a lot of stress when he works at his office. He knows that tele-working from home could be better for him.

Luis tendría menos estrés si (TRABAJAR) __________________ desde casa.

3. Pablo is a great swimmer but he knows he needs to keep training really hard to stay at the top.

Si Pablo no (ENTRENAR) __________________ más horas, no sería el mejor.

4. You have a very good friend at your hometown, but you have not really called her lately. You know you should call her more often to keep your friendship alive.

Mantendrías una muy buena amiga si (CUIDAR) __________________ tu amistad.

5. You have midterms in two weeks and you are starting to feel stressed. You might sign up for yoga classes to feel more relaxed.

Si (PRACTICAR) _____________________ yoga, te sentirías más relajado.

6. Your roommates are very noisy and they do not let you sleep at night. You want to talk to them so that you can sleep more hours.

Serías más productivo si (DESCANSAR) __________________ más horas.

7. Juan is not good at math, and might struggle at his Calculus class. He is going to try to remain positive and self-confident.

Juan intentaría ser optimista si la clase de cálculo le (CAUSAR) ________________ problemas.

8. Pablo has a lot of pressure from his parents to get straight A’s. He is afraid he might not be able to achieve that goal, but he is going to remain calm.

Si a Pablo le (PREOCUPAR) __________________ no obtener A’s en todas sus clases, debería permanecer tranquilo.
9. You are a very emotional student and you know that your emotions make it difficult for you to concentrate, and that you should control them.

Te concentrarías mejor si (CONTROLAR) ______________________ tus emociones.

10. You find it hard to study at the library and you think you might focus better on your studies in your room.

Si (ESTUDIAR) ______________________ en tu habitación, aprenderías más rápido.

11. Your room is always a mess and you leave your clothes all over the floor, which annoys your roommate. He would appreciate a bit more of organization.

Si no (DEJAR) _________________ toda tu ropa por el suelo, tu compañero de cuarto sería más feliz.

12. Manuel just found a new job but he is not very happy with his new co-workers. He is going to talk to his boss, who looks very understanding, in case the situation does not change.

Manuel necesitaría hablar con su jefe si no se (ADAPTAR) ______________________ a su nuevo trabajo.

13. You really like partying and you have reached a point where you feel tired all day long. Taking a break for a while could help you feel better.

Si (ABANDONAR) ______________________ tu estilo de vida actual, tu cuerpo te lo agradecería.

14. Juan is very forgetful and might have left his keys at home. That is a problem because nobody else could open his office.

Juan no podría entrar en su oficina si (OLVIDAR) ____________________ las llaves en casa.

15. You have lived in the US all your life and are considering moving to Europe next year. You do not know how to announce it to your parents because they might not like the idea.

Si (ANUNCIAR) ______________________ a tus padres tu marcha a Europa, se llevarían una gran sorpresa.

16. Miguel is running out of food and he does not have any money left to buy groceries this week. He might need to ask his roommate to share some of his.

Miguel le pediría comida a su compañero si se le (TERMINAR) ______________________ la suya.
17. The new president only speaks English. He knows that speaking Spanish would increase his popularity among Hispanic voters.

Si el presidente (HABLAR) ________________ español, sería más popular entre los hispanos.

18. You are taking too many painkillers to fight that headache you have had for days, and now you have a stomachache. You are considering taking less painkillers.

No tendrías dolor de estómago si (TOMAR) ________________ menos medicamentos.

19. Juan wants to travel abroad this summer and he is considering going to Spain, because he has heard their food is amazing.

Si Juan (VIAJAR) ________________ a España este verano, probaría comida deliciosa.

20. You are considering taking French II in the spring rather than in the fall because you have heard the instructor is better and it could be easier.

La clase de francés II sería más fácil si tú (ESPERAR) ________________ a la primavera.
Appendix H

Comprehension test

Based on what you have just read, circle the right answer.

1. According to popular knowledge…
   a) Intelligence is what really matters to succeed in life.
   b) Intelligence and willingness to succeed are equally important.
   c) Willingness to succeed is what really matters to succeed in life.

2. Being able to learn…
   a) occurs if we know how to read, despite an additional effort.
   b) occurs if we know how to read and put some additional effort.
   c) is not related to either a) or b).

3. A highly gifted individual…
   a) will not need as much discipline to succeed as an average individual.
   b) will need the same discipline to succeed as an average individual.
   c) will need more discipline to succeed than an average individual.

4. Mens sana in corpore sano refers to…
   a) the importance of doing exercise before studying to obtain better results.
   b) the fact that doing physical exercise is actually more important than studying.
   c) the importance of physical exercise as a complement to mental exercise.

5. Students would better process the information if…
   a) they took short breaks every 2-3 hours of study.
   b) they ate small snacks (like energy bars) that enhance productivity.
   c) they slept between 7 and 9 hours a day.

6. Better structuring the information will depend on…
   a) setting long-term goals.
   b) setting short-term goals.
   c) a combination of both.

7. In case learning is not happening at the desired pace…
   a) students will have to modify their studying habits.
   b) students will need to value their effort.
c) students will need to seek external advice.

8. Not controlling their emotions…

a) will negatively affect their energy and concentration.
b) will affect their sleep and subsequent performance.
c) will negatively affect their relations with other students.

9. Studying always at the same place…

a) might become tedious, discouraging the student.
b) could actually enhance productivity.
c) might be distracting for the student, reducing productivity.

10. The temperature to study…

a) should be a bit cool to help the student better concentrate.
b) will have an impact on the student’s performance.
c) will not really have an impact on the student’s performance.
Appendix I
Language Background Questionnaire

*Please provide the following information, if you have any questions about one of the items please ask for clarification from the researcher. Thank you.*

Name: _______________________________    Age: __________________   Sex (circle one): M    F
Childhood language(s): _______________________
Years of Education: ___________________________
Are you majoring in Spanish?    Yes    No
Are you minoring in Spanish?    Yes    No
1. How many years/semesters have you studied Spanish in a classroom setting? _____
2. At what age did you begin learning Spanish? _________
3. Please rate how often you use Spanish in the following contexts using the following scale:
(Please write the number in each blank)

<table>
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<th>Always = 5</th>
<th>Often = 4</th>
<th>Sometimes = 3</th>
<th>Rarely = 2</th>
<th>Never = 1</th>
</tr>
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6 a. Have you studied, or do you speak, any other languages aside from Spanish?
   _____ Yes    Language: _______________ Years studied: ____________
   ____________________    ____________________
   ____________________    ____________________

   _____ No

6 b. If you answered yes to 6a, please rate the perception of your skills in that language in the following areas:
5 = very confident; 4 = mostly confident; 3 = I'm not sure; 2 = somewhat confident; 1 = not at all confident

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7. Please rate your perception of your skills in English and Spanish in the following areas:

5 = very confident; 4 = mostly confident; 3 = I'm not sure; 2 = somewhat confident; 1 = not at all confident

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**Spanish:**

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8. Have you traveled to a Spanish-speaking country for more than 2 weeks in the past year?

Yes  No

If yes, please explain:

__________________________________________________________________________________

__________________________________________________________________________________

_____________________________
9. Do you think that thinking aloud was helpful to comprehend better while you were reading the text?

10. Do you think that thinking aloud while reading the text was helpful in learning the new grammar structure?

11. Had you already studied the grammatical form that you learned in this study, the Spanish imperfect subjunctive? Did you learn about this form outside the laboratory? (i.e., asking your instructor or checking your Spanish textbook)
Appendix J

Instances of processing:

Deep level of processing:
“if you eat salad, if you think, no, its not salad geez, salad salud seria mas facil concentrate en los estudios What?! If … so that’s the new thing, the hypothetical .. if you seria mas facil … its easier to concentrate on your studies, so if you do something its easier…” (Participant 16)

“if one is not motivated, or if one does not motivate students, if one were not to motivate students enough only their intelligence no bastaria, would not be enough to have success.” (Participant 43)

Intermediate level of processing:
“If you worry yourself you won’t umm improve your speed, you should think in the…. Ventajas de tu esfuerzo, I don’t know what ventajas is, maybe windows? You’ll see into something?” (Participant 49)

“If you don’t control your emotions podrian… put.. you should put.. or put… no you should… no you can restart, regain energy and concentration.” (Participant 52)

Low level of processing:
“Include si alguna asignatura te causara dificultades, deberías confiar en ti.” (Participant 37)

“and study every day in a different site, distra..I think you’ll be distracted.” (Participant 21)
References


