THESIS

EFFECT OF TEXTUAL ENHANCEMENT AND EXPLICIT RULE PRESENTATION ON THE NOTICING AND ACQUISITION OF L2 GRAMMATICAL STRUCTURES: A META-ANALYSIS

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In partial fulfillment of the requirements

For the degree of Master of Arts

Colorado State University

Fort Collins, Colorado

Summer 2011

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ABSTRACT

EFFECT OF TEXTUAL ENHANCEMENT AND EXPLICIT RULE PRESENTATION ON THE NOTICING AND ACQUISITION OF L2 GRAMMATICAL STRUCTURES: A META-ANALYSIS

This meta-analysis examines whether two instructional treatments would have a positive effect on grammar "noticing" and/or acquisition in an EFL/ESL context. The instructional treatments represent two examples of input enhancement: textual input enhancement and explicit rule presentation. In order to test the effect of these two treatments, I synthesized and analyzed the results of 45 study reports that addressed these two treatments and that were published between the years of 1980 and 2010. Then, I calculated the effect size of each individual study report and the average effect size of all the study reports using a fixed method meta-analysis approach. The average effect size of the explicit rule presentation treatment showed a high effect size (d = 0.30) while the average effect size of the explicit rule presentation treatment showed a high effect size (d = 0.93). The study offers some pedagogical implications for ESL/EFL teachers and some suggestions for future researchers.

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CHAPTER I

INTRODUCTION

How language learners acquire a second/foreign language has been the main focus in SLA research. Researchers have tried to find answers to questions such as how does acquisition occur? How do language learners process the new language? And what might affect this process? Language teachers, on the other hand, are more concerned with narrow questions such as what is the role of implicit versus explicit instruction? Is focus on form or focus on meaning more effective? And what other factors that might affect language learning? In fact, teaching grammar, in particular, to speakers of other languages is a controversial issue in the TESL/TEFL research. "How do we go about teaching grammar items in the most effective way?" is a concern of almost all grammar teachers (Richards & Renandya, 2002, P. 145). Researchers have applied and tested many methods of teaching and the argument remains on how input should be presented to the language learners (see Chapter II).

Krashen (1982) stated that there are two independent processes related to second/foreign language development. The first one is called language acquisition which is the subconscious process of second/foreign language development. The second one is language learning which is the conscious process that results from instruction and knowledge of the grammatical rules. According to Krashen, the first competence is the one that enables the language learners to develop their second/foreign language to become a native-like. The second

one is only needed to edit the speech and think about the necessary grammatical rules that need to be applied. That assumption led to the "Input Hypothesis". Krashen (1982) proposed the "Input Hypothesis" which stated that in order for humans to acquire a language, they have to be presented with comprehensible input. For him, learning a second/foreign language could occur unconsciously without any awareness of the learning situation or any attention to the new target forms. Because of this claim, language teachers do not have to instruct the language learners explicitly. Their job is limited to providing sufficient comprehensible input that is slightly ahead of the learner's current level of knowledge. This input should have the sufficient amount of grammar that teachers should not teach. By following this process, language learners will acquire the language naturally (Krashen, 1985).

Other researchers have challenged this hypothesis. Gass and Selinker (2008) argued about the levels of knowledge and the amount of input that is sufficient. In addition, interactionists such as Long (1996) have argued that input alone is not enough. In fact, even Krashen himself admitted that comprehensible input alone might not suit beginning language learners (Krashen, 1994). Furthermore, language learners acquire new target forms when the input they are exposed to is transferred into intake (Gass, 1997; VanPatten, 1996). In order for this process to take place, input has to be enhanced so that the language learners can notice this input and convert it into intake (Gass, 1997; VanPatten, 1996). This is why "noticing" has become essential in second language acquisition.

Schmidt (1990) introduced the "Noticing Hypothesis" which stated that "noticing is the necessary and sufficient condition for the conversion of input to intake for

learning" (Schmidt, 1994, p. 17) and that "what must be attended to and noticed is not just the input in a global sense but whatever features of the input are relevant for the target system" (Schmidt, 1993, p. 209). Schmidt (1995) stated that "noticing" which represents the lower level of awareness is needed and attention to the new target form is necessary for second/foreign language acquisition. A large and probably growing number of researchers adopted the "Noticing Hypothesis" (e.g. R. Ellis, 1984; Fotos, 1993; 1994; Fotos & Ellis, 1991; Harley, 1993; Larsen-Freeman & Long, 1991; Long, 1991; Robinson, 1995; 1996). On the other hand, other researchers argued about what "noticing" means, whether it is conscious or not and how it could be measured (discussed in Chapter II). Despite all the controversies, "noticing" plays a major role in second/foreign language teaching/learning. In fact some philosophies of second/foreign language teaching/learning depend on "noticing". One of these is input enhancement.

Sharwood Smith (1991, 1993) introduced the concept of input enhancement as a way of developing grammar instruction in second/foreign language classrooms. Input enhancement has many different kinds that aim at making some forms of the second/foreign language more salient in order to draw the students' attention to them. Therefore, it is a process that cannot be achieved without "noticing". These kinds of input enhancement differ in the degree of explicitness and elaboration. Explicitness refers to the degree of sophistication used in attention-drawing. The highest degree of explicitness is in the form of meta-linguistic description of the target form(s) while the lowest degree of explicitness is in the form of textual enhancement of the target form(s). Elaboration, on the other hand, refers to the depth and amount of time given during the implementation of the input enhancement technique. Many studies have examined the

effectiveness of these different kinds of input enhancement on different kinds of English skills as will be discussed in Chapter II. However, it seems that the main focus of input enhancement in the history of research in second/foreign language acquisition has been the effect of input enhancement on the acquisition of grammatical forms (example studies are Alanen, 1995; Doughty, 1991; Leow, 1997, 2000, 2001; Leow et al., 2003; Overstreet, 1998, 2002; Robinson, 1997; Scott, 1989, 1990; Shook, 1994; White, 1998; Wong, 2003). This study will focus on the effect of only two kinds of input enhancement: textual (visual) input enhancement and explicit rule presentation (explicit instruction) on the "noticing" and/or acquisition of target grammatical structures.

Textual input enhancement is a technique that is used to increase the saliency of the new target form(s). When a form is textually enhanced, this means that the form has different typographical features from the rest of the other forms such as different color, different font style, use of italics, boldface or underlining and etc. (Wong, 2005). Sometimes, the teacher/researcher will use one of these text features (e.g. Alanen, 1995; Heo, 2007). Other times researchers combine two features or more together (e.g. De Santis, 2008; Grim, 2005; Ha, 2005; Izumi, 2002; Jourdenais et al., 1995; Lee, 2007; Leow, 2001; Leow, et al., 2003; Overstreet, 1998; Shook, 1994; White, 1998; Wong, 2003). In addition, textual enhancement can be combined with other enhancement techniques (see Chapter II).

Similar to textual input enhancement, explicit rule presentation can also be combined with other types of input enhancement as will be discussed in Chapter II. Explicit knowledge is the kind of knowledge that language learners are aware of and can express (DeKeyser, 1998). It could be either explicit declarative knowledge which means

conscious knowledge of the rules of the language or explicit procedural knowledge which is the ability to use the learned linguistic items. The term explicit or meta-linguistic means highly analyzed. Therefore, when teachers/researchers talk about explicit instruction, they mean the process of analyzing the structural part of the language in a way that makes it more available to the conscious introspection (Sharwood Smith, 1994). This means that explicit learning is a conscious and intentional process that requires focus on the linguistic structures of the language. It involves conscious perception of what is stored in the memory and conscious awareness of the rules that organize the stored information. On the other hand, implicit learning is the acquisition of the language through a natural, unconscious and incidental process that does not require attention and that results in implicit knowledge which is the basis for spontaneous performance (N. Ellis, 1994). The terms "explicit" and "implicit" are sometimes exchanged with the terms "deductive" and "inductive". However, the two sets of terms do not mean the same thing. Deductive learning occurs when the language learner uses additional knowledge such as parametric options possibly provided by Universal grammar rules to understand the new learned target forms. Inductive learning, on the other hand, occurs when the language learner forms generalizations based on presented examples (DeKeyser, 2003). Therefore, deductive and inductive learning could be used to describe a specific learning situation during implicit or explicit learning or instruction.

Explicit versus implicit instruction is basically a representation of the conscious/subconscious learning philosophy. Krashen's philosophy is that conscious learning results in knowledge about the language while unconscious learning results in knowledge of the language. Therefore, he suggested that second language acquisition

should be similar to first language acquisition in which the language learners are only provided with the input with no explicit instruction on the forms of the language. However, as will be discussed in Chapter II, focus on meaning approach in language teaching that is the result of Krashen's philosophy does not enable the language learners to achieve a native-like proficiency in the language. In addition, J. Williams (2009) stated that implicit learning could lead to explicit knowledge when the language learner becomes aware of the regularities in the input and forms knowledge of the language. Explicit learning could also lead to implicit knowledge. This happens as a result of the constant practice of the explicitly learned forms. The new target forms become automatised and used with no awareness. In fact, it seems that many researchers in the field of TESL/TEFL have started to realize that explicit instruction is not only a luxury of learning about the language, but it also results in language development (Han, 2008).

Some studies have examined the effectiveness of combining these two kinds of input enhancement (textual enhancement and explicit rule presentation) on the "noticing" and/or acquisition of grammatical forms. Other studies tested the effect of each kind separately. However, it seems that the results of these studies are contradictory. Therefore, there is a need for a meta-analysis study that shows the influence of such types of input enhancement on "noticing" and/or acquisition of target grammatical structures. This study will provide a synthesis of the previous research studies that have examined the effect of textual input enhancement and/or explicit rule presentation on the "noticing" and/or acquisition of target grammatical structures. This research will be useful for language teachers, in general, and ESL/EFL teachers and curriculum developers, in particular.

Glass (1976) defines meta-analysis as analysis of analysis. Meta-analysis research represents a synthesis of results from series of studies. Meta-analysis research has many purposes. In this study, the purpose of meta-analysis is to look at individual experimental studies that have examined the effect of textual input enhancement and/or explicit rule presentation on the "noticing" and/or acquisition of target grammatical structures and statistically synthesizes the results of these studies to draw conclusions on such an effect. Researchers have developed different methods to perform a metaanalysis. However, the most commonly used is the one developed by Glass (1976). This method calculates the effect size of each individual study. The effect size represents the impact of an intervention on test scores. It could also represent the relationship between any two variables such as the difference between the male scores and the female scores.

In this study, the effect size represents the impact of two interventions which are textual input enhancement and explicit rule presentation. It is calculated by dividing the difference between the mean scores of the treatment group and the mean scores of the control group by the standard deviation of the control group. Therefore, the measurements of the effect size represent the measurements of the mean differences. Another way of calculating the effect size is by dividing the difference between the mean scores of the treatment group and the mean scores of the treatment group by the standard deviation see Chapter III). It seems that most researchers prefer the second method because it is more reliable (Hedges et al., 1989). If the effect size is considered robust. The effect size is considered low if it is 0.20, medium if it is 0.50 and high if it is 0.80 (Cohen, 1988).

In a meta-analysis, there are certain steps that a researcher should follow in order to produce an unbiased synthesis and analysis of the primary research findings. The researcher has to decide a problem to search which means defining the variables that are to be examined in the meta-analysis. The second step is to decide the criteria for relevance of studies that are to be included in the meta-analysis. Then, the next step will be to locate these studies through extensive search of the literature. When locating the research studies, the synthesist develops a coding sheet to compare and contrast the characteristics of the located studies. After that, the researcher decides the unit of analysis, analyzes and interprets the data and reports the findings (Cooper, 1998, 2010; Hedges et al., 1989). These steps will be applied in the following chapters of this thesis.

The purpose of this study is to examine the effect of two kinds of input enhancement (textual input enhancement and explicit rule presentation) on the "noticing" and/or acquisition of target grammatical forms in a second/foreign language setting. This will be achieved through conducting a meta-analysis that statistically synthesizes the results of previous studies that have examined the effect of such variables on "noticing" and/or acquisition of grammar. Therefore, this study seeks to answer the following questions:

- 1. Does textual input enhancement have an effect on grammar noticing/acquisition in an ESL/EFL context?
- 2. Does explicit rule presentation have an effect on grammar noticing/acquisition in an ESL/EFL context?
- 3. Which one of these two kinds of input enhancement has a higher effect?

The study attempts to find evidence for the following hypotheses:

- 1. Textual enhancement has a significant effect on noticing and acquiring the grammatical forms.
- Explicit rule presentation has a significant effect on noticing and acquiring the grammatical forms.
- 3. Explicit rule presentation has a higher effect than textual input enhancement.

Chapter II will present a literature review of selected contradictory theories that concern input and "noticing" and the role they play in second/foreign language acquisition. It will also present some of the approaches that dominated language teaching, in general, and grammar teaching, in particular. The chapter will describe input enhancement techniques, in general, and textual input enhancement and explicit rule presentation, in particular. Chapter III will present the methodology of the study, discuss the procedure followed in choosing and coding the studies and provide the formulas that will be used to calculate the effect size. Chapter IV will display the results of the metaanalysis study. Chapter V will discuss the findings and provide some pedagogical implications and research suggestions.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

The review of the literature related to this study is divided into six interrelated sections. The first section presents arguments concerning "noticing" and second/foreign language acquisition. This leads into section two which shows the general approaches that have dominated English teaching, in general, and grammar teaching, in particular. Section three describes input enhancement, kinds of input enhancement and how they have been examined in English teaching/learning. Sections four and five present two kinds of input enhancement (textual input enhancement and explicit rule presentation) and discuss the effectiveness of applying these two kinds of input enhancement in second/foreign language teaching/learning. The last section in this chapter discusses the importance of meta-analysis research, shows examples of reviews that a meta-analysis can follow and represents summaries of meta-analysis research that have addressed topics related to the main focus of this study (textual input enhancement and explicit rule presentation).

2.2 Input, "Noticing" and Second/Foreign Language Acquisition

There are two kinds of input that language learners face in their second/foreign language acquisition. The first one is interactional input which refers to the target forms that the learners receive through communicating with at least one person, native or nonnative. The second kind of input is called non-interactional input which refers to the input that the learners receive in a non communicative way, for example, through reading a text in the second/foreign language (N. Ellis, 1994). Whether it is the first or the second kind, this input has to become intake in order for language acquisition to acquire. Gass (1988) suggested five stages of second language acquisition.

Language acquisition starts with the input that the learners are presented with. However, not all the input that learners hear or read becomes intake. Only some amount of the input is noticed. There are some factors that affect the "noticing" of the input such as frequency of the input, infrequency of the input that might attract advanced learners, affect factors (such as motivation and attitude), prior knowledge of the language and attention. These factors are not always independent from each other. For example, the learner's attention might be captured by the frequency of the input that he/she hears/reads. When that happens, the noticed input becomes apperceived input. This is the first stage of input utilization. "Apperception is an internal cognitive act, identifying a linguistic form as being related to some prior knowledge." (Gass & Selinker, 2008, p. 482). When the input is apperceived, it has to become comprehended before it is transferred into intake. The comprehension in this stage means that the language learner analyzes the input to extract meaning. In fact, this is a multistage process. This is because the learner can comprehend the input at the level of meaning which means that he/she has an idea of the general meaning of the input. On the other hand, the learner can analyze the input more deeply to understand the components of the input such as the syntactic structure of the input. When that happens, the input is transferred into intake. In fact, comprehended input does not always become intake. Sometimes, the input that the learner receives might become comprehended only temporarily for the purpose of the

current task.

Intake is the next stage of acquisition. Gass and Selinker (2008) defined it as "the mental activity that mediates between input and grammars" (p. 486). The level of analysis that the learner performs could determine whether the comprehended input becomes intake or not. It is suggested that the analysis at the level of meaning has little chance to be transferred into intake than the analysis at the level of syntax. There are three major processes that take place in the intake stage and that lead to the fourth stage which is integration. These processes are hypothesis confirmation, hypothesis testing and hypothesis rejection. Hypothesis conformation starts when the learner hears/reads a sentence in the target language and tries to analyze the grammatical structure of that sentence. The learner, then, will test that analysis against other sentences that are heard/read later on. If the analysis was wrong, the learner will reject the first analysis that was confirmed earlier. These three hypotheses lead to integration which could be defined as the process of using the information that has become intake to modify the learner's interlanguage system. The final stage in this model of acquisition is the output which is the learners' ability to produce in the second/foreign language using the new target forms (Gass & Selinker, 2008).

In a pilot study, Swain (1998) talked about how encouraging the language learners to produce in the target language helps them in testing the three hypotheses mentioned in Gass's model of second language acquisition. The subjects in her study were adult learners in French immersion programs in Canada. The study was designed mainly to test the effect of output on language learning. The subjects were eight grade students who were studying academic subjects some in French and others in English.

The task type used in this study was called "dictogloss". The researcher divided the subjects into two groups. Both received modeling of the task by the researcher and the teacher. The difference was that one group received modeling using meta-linguistic terms and rules while the other one did not. The results showed that the group who received the meta-linguistic modeling produced more accurate forms than the one that did not. Swain stated that the reason behind this is that the meta-linguistic explanations captured the subjects' attention and encouraged them to produce forms that are more accurate. In addition, Swain mentioned that when the subjects produced in the target language, they noticed the gap between their output and the input they primarily received which helped them in reconstructing their output. Therefore, producing the output helps the language learners to confirm, test and if needed reject or reformulate their output.

VanPatten (1996) suggested another model of second/foreign language acquisition. In his model, three sets of processes (input processing, system change and output processing) must take place in order for second/foreign language acquisition to occur. When the language learners are presented with input, they have to notice and attend to the input in order for form-meaning connection (connecting particular meanings to particular forms whether they are grammatical or lexical) to take place. Then, the form-meaning connection that represents the intake will be stored in the working memory before it is internalized. Form-meaning connection is the first sub-process in this model of language acquisition. The second one is parsing which is the process of mapping syntactic structure in the sentence in order for the learner to be able to recognize what the subject and what the object is in a sentence. The system change process takes place when the intake is internalized and becomes a developing part of the linguistic system. The last

process occurs when the learner starts to produce the new target forms.

Many studies have examined the effect of processing instruction (example studies are Allen, 2000; Benati, 2001, 2004, 2005; Collentine, 1998; Salaberry, 1997). VanPatten and Cadierno (1993) were the first to examine the effect of processing instruction on second/foreign language acquisition. Their study tested the effect of processing instruction on the acquisition of a Spanish grammatical structure (direct object pronouns) in university level classes that teach Spanish as a foreign language. The researchers had three groups: the first two were taught the target structure one using traditional grammar instruction and the second one using processing instruction and the third group received no instruction. The researchers assessed the groups using a sentences-level interpretation task and a production task. The results showed that the processing instruction group outperformed the other groups in the interpretation task and had equal gains with the traditional group in the production task.

Over the years, researchers have formulated and tested different hypotheses and methodologies depending on these two models of second language acquisition (as will be discussed in the next sections). However, it seems that the above-mentioned models of second language acquisition share a common theme. According to Gass's model of second language acquisition, input has to be noticed before it becomes intake and according to VanPatten's model in order for form-meaning connection to take place, the language learner has to notice and attend to the form first. Therefore, in both models of second/foreign language acquisition, the input has to be noticed before it becomes intake or before any form-meaning connections are made. This explains why "noticing" is an essential and necessary language skill that helps language learners acquire new aspects of

the target forms.

Several studies have argued about the type and amount of "noticing" and attention that is sufficient to transfer the second/foreign language input into intake (Gass, 1998; Gass & Selinker, 2008; Rutherford & Sharwood Smith, 1985, 1988; Schmidt, 1990, 1993, 1994, 1995; Schmidt & Frota, 1986; Sharwood Smith 1991, 1993; Tomlin & Villa, 1994). Schmidt (1993) claimed that "noticing" is the conscious awareness of the input. He explained that intake is chosen from the input to be stored in long-term memory while unattended items remain in the short-term memory and eventually disappear. Schmidt (1990; 1993; 1994; 1995) and Schmidt and Frota (1986) suggested two processes of "noticing" which must take place at the same time. First, the learners must notice the target forms provided in the input they are exposed to. Then, they must notice the differences between the use of these target forms in the input and their own use of these forms in their output.

Schmidt (1995) views "noticing" as the low level of awareness while the high level is the understanding. Therefore, "noticing" is the surface level which represents the conscious registration of the occurrence of some event. On the hand, understanding is the deeper level that is the recognition of a general principle whether it is rule or pattern. This means that "noticing" is the surface level of learning but understanding is the deeper level of abstraction related to different kinds of meaning whether semantic, syntactic or communicative meanings. Schmidt (1995) gave an example:

"In syntax, awareness that on some occasions speakers of Spanish omit subject pronouns is a matter of noticing. Being aware of that Spanish is a pro-drop language, which entails numerous syntactic consequences beyond such surface phenomena as the presence or absence of pronouns, is a matter of understanding". (Schmidt, 1995, p. 30) Schmidt (1995) stated that "attention and awareness at the level of noticing are flip sides of the same coin" (p. 18). In fact, even in psychology and cognitive science, many have agreed that there is no learning without attention (Carlson & Dulany, 1985; Kihlstrom, 1984; Logan, 1988; Posner, 1992; Velmans, 1991). Unattended items are stored in the short-term memory. Because of that, they tend to disappear in a short time. Only the attended items are stored in the long-term memory.

On the other hand, Tomlin and Villa (1994) contradicted Schmidt's (1994) "Noticing Hypothesis" and renamed "noticing" as detection with selective attention. They argued that "detection is the process by which particular exemplars are registered in memory and, therefore, could be made accessible to whatever the key processes are for learning, such as hypothesis formation and testing" (Tomlin and Villa, 1994, pp. 192-193). For them, detection does not need to be conscious and does not require awareness. Awareness is needed only to set up the circumstances for detection and, therefore, it does not lead directly to detection. As for attention, it is viewed as alertness which is the readiness to deal with incoming stimuli, orientation which is a specific aspect of the language such as form or meaning and detection which is the cognitive registration of the stimuli. Attention plays little or no role for automatic activities while for controlled processes attention is the major factor. Automaticity is the fast and unconscious processing of input when there has been already an association in the learner's mind between the input that the learner receives and the output he/she is supposed to produce. On the other hand, controlled processing refers to the planning and monitoring of the output when the learner consciously thinks about what to say and what structures to use (Gass & Selinker, 2008). However, Schmidt (1995) argued that the studies that Tomlin

and Villa have relied on (studies of subliminal perception and blind sight) prove that there is detection without awareness but they do not prove that there is learning without awareness.

To resolve that conflict, Robinson (1995) suggested that we can look at "noticing" as a combination of detection and rehearsal in short time memory. In fact, deciding the nature of "noticing", whether it depends on conscious awareness or not and whether it needs attention or not is always going to be a controversial issue (Carroll, 2001; Truscott, 1998). This is because the "Noticing Hypothesis" can never be proven to be right or wrong due to the difficulty of recording the internal process of language learning. However, many have agreed that attention is important and promotes language acquisition (Jourdenais et al., 1995; Leeman et al., 1995; Leow, 1997; Rosa & O'Neill, 1999). The question then becomes how to draw the language learners' attention to notice the new target forms.

According to N. Ellis (1994), there are numbers of factors that could increase the language learners' chance of "noticing" the new target forms. These factors include task demands, existing linguistic knowledge, frequency of the new target form in the input, salience of the new target form and interactional modification during negotiation of meaning. The last three factors are types of input enhancement that will be discussed in this chapter. However, before discussing input enhancement, it is worth looking at the approaches and teaching methods that dominated language teaching, in general, and grammar teaching, in particular, in the past. The purpose of that is to see which of these approaches or methods have relied on or encouraged "noticing".

2.3 Second/Foreign Language Approaches

In the history of second/foreign language teaching, researchers and teachers implemented three main approaches only one of them encouraged "noticing" The first approach was focus on forms approach which is also called synthetic approach (Wilkins, 1976). It is also referred to as synthetic syllabi, lexical, structural, notional-functional, in practice to date, topical or situational approach. In this approach, language acquisition is perceived as a gradual accumulative process of teaching. Therefore, language learners learn each part of the language separately in a gradual manner. For example, the teacher breaks down the language into grammatical rules and vocabulary. Each is taught separately from the other one. The language learners, then, have to synthesize these two language components to communicate in the second/foreign language. They also have to put the vocabulary they learned into sentences using structures that depend on previously learned grammatical rules (Long & Robinson, 1998).

Some methods emerged as a result of this approach such as Grammar Translation Method. This method started in the sixteenth century with the focus on grammar teaching. The aim of this method was to teach the students how to read the foreign language literature. The Grammar Translation Method claimed that when the language learners study the grammar of the target language, they become able to read and write in the foreign language. In addition, knowledge of the grammar of the second/foreign language increases the grammatical knowledge of the first language and, therefore, increases the written and oral communication in the first language. As a result, the focus at that time was on teaching and memorizing the grammatical rules and translating from L1 to L2 and vice versa (Larsen-Freeman, 2007; Wong, 2005).

In the mid nineteenth century, another method influenced by the focus on forms approach and inspired by the behaviorist psychology and structural linguistics appeared. This was the Audiolingual Method. Language learning was considered a habit formation process through repetition, imitation and reinforcement. Language learners learned grammar through analogy rather than analysis. In addition, teachers did not teach grammar explicitly. Language learners were expected to gain grammatical knowledge through drills (Larsen-Freeman, 2007; Wong, 2005). The problem with the focus on forms approach with its synthetic methods is that it does not enable the students to achieve a native like use of the target forms (Long & Robinson, 1998).

As an alternative to focus on forms approach, focus on meaning appeared on the stage of second/foreign language teaching. Using this analytic approach (Wilkins, 1976), second/foreign language teachers taught the learners incidentally without attention or implicitly without awareness in a setting that is similar to first language acquisition. Such a setting is similar to Prabhu's procedural syllabus, Krashen and Terrell's natural approach and immersion education contexts (Long & Robinson, 1998). Prabhu's procedural syllabus started in Bangalore, South India by a team led by Prabhu in 1987. The idea behind this syllabus was that language learners could learn through communication when presented with interaction tasks that expect them to negotiate meaning together with the supervision of the teacher and with no focus on any linguistic forms (Carter & Nunan, 2001). This is similar to Krashen and Terrell's natural approach that started in 1977. According to this approach, a second/foreign language should be learned naturally when it is used in a meaningful way with no focus on any linguistic forms. Immersion education, on the other hand, refers to the immersion programs that

started in Canada since the 1970's. These programs teach the children as well as the adults to use the target language in a communicative setting that focuses only on meaning. This happens when the language learners learn school subjects such as math and science using the second/foreign language as the medium of instruction.

Influenced by the focus on meaning approach, the Direct Method emerged in the early nineteenth century. Since the Grammar Translation method based on focus on forms approach did not lead to oral proficiency in the second/foreign language, the Direct Method emerged to compensate for the previous one. It argued that second/foreign language acquisition should be similar to child first language acquisition. Language teachers did not teach grammar explicitly but encouraged the learners to draw their own conclusions after being exposed to examples. Therefore, grammar teaching was inductive (Larsen-Freeman, 2007; Wong, 2005).

Researchers have claimed that the focus on meaning approach is not successful because older learners do not have the same ability that children have which facilitates their acquisition of a language through exposure only (Hyltenstam, 1988; Long, 1990, 1993; Newport, 1990). This was a major flaw in the Direct Method. Focusing on meaning only did not help in achieving a native-like language. In fact, the immersion programs have proved that lack of focus on form in second/foreign language teaching results in low level of proficiency in the second language. Studies have shown that after many years of learning, the learners were not able to use the target language fluently (Day & Shapson, 1991; Harley, 1993; Swain & Lapkin, 1989). Swain and Lapkin (1989) found that after years of meaning-based instruction, the language learners were still struggling with the language and had difficulty in producing accurate grammatical forms

such as the conditional tense. In addition, Swain and Lapkin (1989) compared early immersion programs that start at the age of five to late immersion programs that start at the age of eleven, twelve or thirteen in Ontario and Quebec. They found that the test scores of both kinds of learners (early learners and late learners of French) were similar. Both kinds of learners did not reach a proficient level in the target language. In fact, Swain and Lapkin (1989) stated that what immersion programs teach us is that language and content should be integrated. Another reason why focus on meaning was not successful is that some forms are too difficult to be learned from positive evidence alone (from comprehensible input alone) and some are rare or not salient enough for the language learners to be noticed. Therefore, input enhancement techniques whether they are implicit or explicit are necessary to draw the language learners' attention to these forms (Long & Robinson, 1998).

Neither the focus on forms approach that dominated the 1950's and 60's nor the focus on meaning approach that was popular in the 1970's and 80's addressed the needs of second/foreign language learners (Lightbown, 1985). This is because focus on meaning solely or on form solely is not sufficient to achieve a native-like proficiency in the target language. Therefore, classrooms that merge attention to form with attention to meaning were needed for second/foreign language acquisition (Leeman et al., 1995). This has raised the question of how to merge the formal proprieties of the language with the meaning in a communicative setting. To answer this question, researchers have developed new approaches, methods and teaching strategies. One of these approaches is the focus on form approach.

Long (1981, 1996) introduced the focus on form approach as an "Interaction Hypothesis". The "Interaction Hypothesis" suggested that negotiation of meaning between native and nonnative speakers of the language lead to some comprehension checks, clarification requests and repetitions which are called conversational repairs. These repairs aim to make the input more comprehensible and, therefore, they may lead to successful intake (example studies are presented in the input enhancement section). Focus on form indicates that a learner is presented with a linguistic form within a meaningful context. This means that language learners learn a new linguistic form in a communicative setting that requires the learners to interact with each other and negotiate the meaning in authentic language contexts (Long, 1991). Spada (1997) defined focus on form as a pedagogical approach that uses either an implicit or an explicit method to draw the learners' attention to the language. Focus of form contradicts the traditional grammar instruction that Long refers to as focus on forms. The latter entails that teachers teach the target forms in isolation from the meaning while the former encourages second/foreign language learners to notice the new target forms at the same time they are exposed to meaning (Jourdenais et al., 1995). One way of achieving this is through enhancing the input that the learners are exposed to.

2. 4 Input Enhancement

Before introducing input enhancement, Sharwood Smith (1981) presented consciousness-raising as an attempt to solve second/foreign language teaching/learning problems that appeared in focus on forms approaches. Consciousness-raising means that the language teacher tries to raise the language learners' consciousness of the new target form(s). However, the syllabus was still synthetic (Rutherford & Sharwood Smith, 1989;

Sharwood Smith, 1981). In addition, Sharwood Smith (1991) stated that even if the language learners paid attention to the enhanced target forms, this does not guarantee that they will be able to internalize the form. Moreover, many have criticized the term because of the lack of the theoretical support for the relationship between conscious and input processing. Therefore, Sharwood Smith (1991, 1993) exchanged the consciousness-raising term with input enhancement that the teacher can control.

The role of input enhancement is to make some forms of the second/foreign language more salient in order to draw the language learners' attention to them. In fact, Sharwood Smith (199, 1993) divided salience into two kinds: external salience that the teacher or researcher can manipulate and internal salience that language learners cause. There are some techniques that teachers or researchers could use to increase the external salience (discussed in the following paragraphs). As for the internal salience, Park and Han (2008) suggested some factors that can enhance such a kind of salience. These factors are comprehension failure, the learner's current interlanguage knowledge, the learner's bias for meaning over form, learners differences and the learner's first language. However, this study will focus only on how to enhance the first kind of salience which is the external salience through the use of some input enhancement techniques.

N. Ellis (1993, 1995) stated that input enhancement is an effective option in language teaching. Many studies have shown the effectiveness of the role of salient input (enhanced input) in directing the learners' attention to second/foreign language forms (discussed in the next paragraphs). Lee and Benati (2007) claimed that a review of the literature concluded that input enhancement is useful for language development. However, input enhancement does not guarantee that input becomes intake unless

language learners are able to notice the input. Wong (2005) makes a distinction between focus on form and input enhancement. The former requires that learning occurs incidentally in a communicative setting. The later, on the other hand, could be proactive or reactive and does not require a communicative interaction.

N. Ellis (1993, 1994, 1995) divided input enhancement into three main components. The first part is interpretation which is basically grammar comprehension of the new target form(s), "noticing" and cognitive comparing between the learners' use of these forms and the correct use of the forms. The second component is integration that is achieved when the completion of these three phases lead to the knowledge being integrated into the implicit system. The last one is production which refers to the automatic use of the new target forms. Lee and Benati (2007) divide the research on input enhancement into two main components. The first one is manipulating the input that the language learners are presented with using one of the input enhancement techniques (discussed in the following sections). The second component is manipulating how learners interact with the input they are presented with. This study will only focus on the first component which is making the input more salient in order to draw the learners' attention to it. This could be achieved through using different methods such as input flood (frequency), implicit negative evidence by the use of recasts, explicit negative evidence by the use of corrective feedback, use of textual enhancement techniques and finally explicit instruction of the linguistic form or what is referred to as explicit rule presentation.

Input flood means that the language learners are presented with frequent use of the new target form in order to increase the chance of noticing to take place. The idea

behind input flood is that frequent forms are noticed more than infrequent forms and this increases the chance of learning to take place (Wagner-Gough & Hatch, 1975). This could be carried out in both oral and written input. In a written situation, language teachers could present the learners with a passage that contains several usages of the new target form(s). In an oral situation, the teacher could include the new target form(s) in the speech more frequently than the other forms.

This kind of input enhancement is ideal for meaning-based classrooms that focus on meaningful interaction. In other words, it encourages incidental acquisition. This is because it is an obtrusive technique that does not require the teacher to stop an activity to point something out. The language learners are left on their own to make connections between form and meaning. On the other hand, input flood could be too implicit since the learners might not be able to notice the new target form(s) (Wong, 2005). Some studies have examined the effectiveness of using such a technique in facilitating the acquisition of the grammar of a second/foreign language, for example, Spanish future tense (Lee, 2002a, 200b), meanings and placements of English adverbs (Trahey & White, 1993), participial adjectives and passives in English (Williams & Evans, 1998) and English possessive determiners (White, 1998). Some of these studies showed positive results of the effect of input flood (Lee, 2002a, 200b; Trahey & White, 1993; White, 1998) while others showed negative results (Williams & Evans, 1998).

The second and third kinds of input enhancement are implicit and explicit negative feedback using recasts and corrective feedback. Long (2007) defined recasts as "a reformulation of all or part of a learner's immediately preceding utterance in which one or more non-target-like (lexical, grammatical, etc.) items is/are replaced by the

corresponding target language form(s), and where, throughout the exchange, the focus of the interlocutors is on meaning, not language as object" (p. 77). In fact, this same definition could be used for corrective feedback. This is because recasts and corrective feedback are both negative feedback that the learners get when misusing a specific from in the second/foreign language. The difference between these two kinds is that one is implicit (recasts) while the other one (corrective feedback) is explicit. An example of the first one could be a sign of communication breakdown that raises the learner's awareness of the incorrect form(s) without interrupting the flow of the conversation. An example of corrective feedback could be explicit error correction (Gor & Long, 2009). Such treatment of the leaner's errors may increase the noticeability and learnability of the new target form(s) (Lightbown & Spada, 1990).

Both kinds of feedback require interaction that is essential in second/foreign language acquisition. This is because these two kinds require negotiation of meaning which makes the input more comprehensible. Recasts are useful for both children and adults (Ishida, 2004; Oliver, 1995). They help in facilitating the acquisition of lexical, morphological and syntactic development (Iwashita, 1999). However, some researchers (Carpenter et al., 2006; Han & Kim, 2007; Mackey et al., 2000) reported in their studies that morphosyntactic recasts were the most frequent to occur in student-teacher interactions but the least recognized by the language learners while phonological recasts were the least frequent to occur but the most recognized. On the other hand, some studies have shown positive roles of recasts and/or corrective feedback in acquisition of the grammar of a second/foreign language, for example, English dative alternation (Carroll & Swain, 1993), English past tense (Doughty & Varela, 1998; McDonough, 2007;

Nobuyoshi & Ellis, 1993), English question formation (Mackey & Oliver, 2002), English past tense and plural (Takashima, 1995), French gender (Lyster, 2004) and French noun formation (Carroll et al., 1992).

As a matter of fact, Han (2008) suggested three pedagogical conditions that, when applied, make recasts more effective in acquiring morphosyntactic structures. Han (2008) stated that when using recasts, language teachers should be careful not to neglect the intended meaning that their students had in their minds. Therefore, if a learner gives an ambiguous utterance, the teacher should wait and see what the learner intended to say or negotiate with the learner to be able to identify the intended meaning. The second condition is that recasts should focus on one target structure at a time. The last condition is that recasts should be practiced more than once to increase the learner's chances of recognizing their mistakes or errors.

The above-discussed instructional treatments (input flood, recasts and corrective feedback) are three types of input enhancement. While these two instructional treatments are important in the study of second language acquisition, this study will only focus on the other two kinds of input enhancement (textual enhancement and explicit rule presentation). The remaining of this chapter will present and discuss each of these as well as provide some example studies that examined the effect of such treatments on the "noticing" and/or acquisition of target grammatical structures.

2.5 Textual Input Enhancement

This study will focus on, compare and contrast the results of only two kinds of input enhancement: textual input enhancement and explicit rule presentation. As mentioned in Chapter I, when using textual input enhancement or what might be referred

to as visual input enhancement, the target form(s) that the students are exposed to have different textual properties. These forms might be bolded, capitalized, italicized, underlined or highlighted with different colors (Sharwood Smith, 1993). When implementing such a technique, researchers and teachers either attract the students' attention or direct their attention. The first one happens when the teacher asks the learners to pay attention to the enhanced form(s). The second one, on the other hand, happens when the teacher does not say anything (Doughty & Williams, 1998).

The purpose behind textual enhancement with its two types is to give the target forms features that are more salient in order to help the learners to notice these forms and to make form-meaning connections. Textual input enhancement has the advantage of directing the learners' attention to form while processing meaningful input. In addition, it can be easily merged with other types of input enhancement such as input flood (e.g. White, 1998). However, textual enhancement is similar to input flood because it does not always guarantee that the learners will notice the target forms and if they did, it does not guarantee that they will understand what it is supposed to be understood. In addition, the focus on the target form might hinder the focus on meaning (Wong, 2005).

This kind of input enhancement is only carried out in written contexts in which language teachers present the language learners with a reading material that contains textually enhanced target form(s). Over the years, researchers have studied textual input enhancement for several purposes. Some of them studied the effect of textual input enhancement when combined with other input enhancement techniques such as input flood (White, 1998) and explicit instruction (Alanen, 1995; Heo, 2007). Others combined textual enhancement with other instructional treatments such as focus on form

(Shook, 1994), output activities (Izumi, 2002), simplified input (Wong, 2003) or topic familiarity (Lee, 2007). Some studies, on the other hand, compared textual enhancement with other input enhancement techniques such as explicit instruction (Alanen, 1995; Doughty, 1991; Hayer, 1997; Kubota, 2000; Shook, 1994). A third group studied the effect of textual input enhancement on "noticing" (Alanen, 1995; Jourdenais et al., 1995; Leow, 2001, Leow et al., 2003). However, it seems that the major concern of researchers has been to study the effect of one or more textual enhancement techniques on the students' "noticing" and/or acquisition of grammatical structures in a second/foreign language setting (De Santis, 2008; Ha, 2005; Jourdenais, 1998; Leow, 2001; Leow et al., 2003; Overstreet, 1998). As will be discussed in Chapter IV, some of these studies have shown a positive effect of the textual input enhancement treatment on grammar "noticing" and/or acquisition while others have not.

In general, we can divide the effect of textual input enhancement into three categories. The first showed that textual input enhancement increases the "noticing" of the new target forms and has a positive effect on the language learners' subsequent output (Jourdenais et al., 1995; Berent and Kelly, 2008). The second showed that textual input enhancement has an effect on the students' "noticing" of the new target forms but with no gain in learning (Izumi, 2002). The last showed that textual input enhancement has no significant effect on "noticing" or comprehension (Leow, 1997). As mentioned earlier, this study will examine whether or not textual input enhancement has an effect on "noticing" and/or acquisition of target grammatical structures. The other kind of input enhancement that will also be examined is explicit rule presentation of the target grammatical structures that is discussed below.

2.6 Explicit Rule Presentation

The second type of input enhancement examined in this study is the explicit rule presentation. A crucial issue in second/foreign language teaching has been which method of instruction is more effective "implicit" or "explicit". Krashen (1985) stated that "the only contribution that classroom instruction can make is to provide comprehensible input that might not otherwise be available outside the classroom."(p. 33-34). Doughty and Williams (1998) explained that though it is possible that second/foreign language acquisition could take place without instruction, we should not limit ourselves to the possible and try to search for the most effective. In fact, Long (1983) was the first one who posed the question of whether second/foreign language instruction makes a difference or not.

In both cases of instruction (implicit or explicit), attention is available but what differs is the issue of awareness of the learning situation (Carr & Curran, 1994; Nissen & Bullemer, 1987; Tomlin & Villa, 1994). Many studies have shown an overall advantage for explicit over implicit instruction (Carroll & Swain, 1993; DeKeyser, 1994; Fotos, 1993; Lightbown & Spada, 1990; Master, 1994; Scott, 1990; Spada & Lightbown, 1993; White et al., 1991). In addition, some have shown a positive effect of explicit over implicit instruction in grammar learning of locative suffixes and four types of consonant alternation of semi-artificial Finnish (Alanen, 1995), English relative clauses (Doughty, 1991), easy rules and hard rules (Robinson, 1995, 1997), past counterfactual conditional sentences (Rosa & O'Neil, 1999) and categorical rules and prototypical rules of an artificial language (DeKeyser, 1995). Many have also argued that some rules are best learned explicitly such as the easy rules that refer to basic categories which could be

applied mechanically and which do not depend on other rules (Green & Hecht, 1992). As mentioned above, Swain (1998) has shown that talking about the grammatical rules and using meta-linguistic terms help in attracting the students' attention to the new target forms. As a matter of fact, there has been a great deal of argument over the issue of which approach is better. DeKeyser (1998) stated that the argument on this issue will remain always unresolved. However, the aim of this study is not to show which one is better than the other one. The goal is to show the difference between the two instructional approaches and to explain how teachers can use explicit rule presentation to increase the language learners' "noticing" of the target grammatical form(s).

When using explicit rule presentation, second/foreign language teachers present the learners with a meta-linguistic description of the new target form (White, 1998). However, the degree of explicitness and elaboration may differ. Explicitness means the extent of the use of meta-linguistic terms or, in other words, the amount of rules presented to the language learner. Elaboration means the amount of time spent in presenting the rules. A high degree of explicitness and elaboration takes place in the classroom when the language teacher presents the rule to the language learners with a detailed explanation that might take a long period of the class time. On the other hand, a low degree of explicitness and elaboration is achieved when the teacher simply presents an example with a quick hint to the rule. In explicit instruction, it is assumed that the language learners go through two processes: memorization and problem-solving. This happens when the learners have to memorize the grammatical rules such as verb conjugations. Then, they use such memorized knowledge to produce new target forms in the target language (N. Ellis, 1994).

Some researchers have argued that explicit knowledge about how a particular target grammatical structure works is helpful in increasing the learners' "noticing" of that form when provided in a communicative input. Others stated that explicit knowledge that results from explicit instruction helps in developing the interlanguage system and therefore acts as a kind of acquisition facilitator. A third group mentioned that explicit instruction is needed for some rules. For example, Krashen (1982) claimed that some rules are easy to acquire but hard to learn and some rules are easy to learn but hard to acquire. The second kind of rules, according to Krashen, is the ones that need focus on form. On the other hand, Hulstijn and De Graaff (1994) argued that easy rules do not need as much instruction as the hard rules.

The issue is that researchers disagree on what makes some rules simple and what makes some of them complex. An example of these rules is the third person singular "s". While Krashen (1982) thinks that this rule is structurally easy, R. Ellis (1990) believes that third person singular "s" is not an easy rule to learn because it is highly complex (DeKeyser, 1998). Some researchers argued that explicit knowledge could convert into implicit knowledge when the learner reaches a stage of development that allows this conversion to take place. In fact, it could contribute to the acquisition of implicit knowledge when the language learner notices the new target forms in the input and compares between the use of these forms and his/her own use of these forms (N. Ellis, 1994). In addition, other researchers claimed that explicit knowledge is of great importance for adult learners who do not have the children's ability of "noticing" the new target forms while focusing on the message (DeKeyser, 2003; Schmidt, 1990).

Second/foreign language researchers conducted several studies to test the effect of explicit teaching on second/foreign language grammar "noticing" and/or acquisition (Akakura, 2009; Alanen, 1995; Ayoun, 2001; Bitchener & Knoch, 2008; Brender, 2002; Day & Shapson, 1991; De Graaff, 1997; DeKeyser, 1995; Erlam, 2003; Fotos & Ellis, 1991; Harley, 1989; Hulstijn, 1989; Leow, 1998; Macrory & Stone, 2000; Master, 1994; N. Ellis, 1993; Rosa & Leow, 2004; Rosa & O'Neill, 1999; Robinson, 1995, 1996, 1997; Sanz & Morgan-Short, 2004; Scott, 1989, 1990; Spada & Lightbown, 1993; Wu, 2007). The form of explicit instruction in these studies differed. In some studies the explicit instruction was a form of meta-linguistic feedback (explicit rule presentation of the misused target form) provided to the learners (e.g. Ayoun, 2001). In other studies, the explicit instruction was explicit rule presentation provided at the beginning of the treatment followed by practice activities (e.g. Erlam, 2003). Some of the studies that examined explicit instruction have shown a positive effect of the explicit instruction on grammar "noticing" and/or acquisition while others have not as will be discussed in Chapter IV. As mentioned in Chapter I, the effect of both types of input enhancement (textual input enhancement and/or explicit instruction) will be examined through conducting a meta-analysis.

2.7 Meta-analysis Research

Meta-analysis research has gained a lot of focus and importance recently. This kind of research gives secondary researchers the chance to synthesize the existing research and statistically calculate the effect size of the treatment(s) in each individual study for the purpose of making comparisons (as discussed in Chapter I). Meta-analysis research can perform two tasks learning from combining the studies and learning from
comparing the studies. Learning from combining the studies means learning from summarizing and explaining the existing research. On the other hand, learning form comparing the studies means the kind of learning that the researcher gets when he/she reanalyzes the studies and makes comparisons of their effect sizes (Hall et al., 1994)

Norris and Ortega (2007) talked about the importance of such kind of research in the field of applied linguistics. This research provides future researchers with problems of interest in the area of applied linguistics. In addition, it enables the secondary researcher to test moderating variables that have not been investigated in individual studies such as task designs (Keck et al., 2006). Furthermore, meta-analysis research can help in discovering research gaps or weaknesses that have not been discovered before. Moreover, it offers recommendations for future researchers (see Chapter V and, for another example, see Norris & Ortega, 2000).

Two reviews have dominated the history of meta-analysis research: narrative review and systematic review. The narrative review dominated meta-analysis research until the 1990s. However, this review had some flaws. The major flaw was the subjectivity and lack of transparency that happens during the process of collecting the studies and calculating the results. There were not any definite rules that specified which studies should be included and which should be excluded. In addition, there were not any standards that decided which studies should be given more weight than others. To compensate for these flaws, the systematic review of meta-analysis emerged in the mid 1980s. This review uses a set of criteria to decide which studies should be included and which should be given higher weight than others. This makes the systematic reviews of

meta-analysis more objective and less biased with results that could be easily replicated (Borenstein et al., 2009).

In the history of second/foreign language acquisition, in general, and grammar learning/teaching, in particular, researchers have conducted meta-analysis research addressing different topics. For example, some researchers studied the effect of motivation and attitudes on second language acquisition (Masgoret & Gardner, 2003), reading and vocabulary learning (Wa-Mbaleka, 2006), effectiveness of recasts and corrective feedback (Li, 2010; Miller, 2003; Miller & Pan, 2009; Russell & Spada, 2006), effectiveness of instruction (Norris & Ortega, 2000) and effect of textual input enhancement on grammar learning (Lee & Haung, 2008). The last two examples are closely related to this study. Therefore, I will summarize these two meta-analyses in this chapter. In addition, I will compare their results to the results of this study in the last chapter.

Lee and Haung (2008) synthesized 16 studies (12 published articles and four unpublished dissertations) to examine the effect of textual input enhancement on grammar learning of second/foreign learners through presenting them with reading tasks. They chose experimental or quasi-experimental studies that appeared between the year of 1981 to the year of 2006 and that used post-tests to measure performance. The chosen studies compared the performance of textual enhancement groups with comparison or control groups. The results showed that the enhanced groups in the synthesized studies outperformed the unenhanced groups by a very small-sized effect (d = 0.22). The researchers argued that the effect size is small probably because the textually enhanced groups were actually compared with other enhanced groups. The comparison groups in

the synthesized studies were provided with input flood which is another input enhancement technique.

Norris and Ortega (2000), on the other hand, conducted a wider meta-analysis in which they synthesized the literature that addressed the effectiveness of second/foreign language instruction with its different approaches and methods: focus on form instruction, form-focused instruction, explicit and implicit instruction, corrective feedback, recasts, input flood and textual enhancement. Norris and Ortega (2000) studied the effect of these types of treatments on the acquisition of second/foreign language morphology, syntax or pragmatics. The researchers synthesized experimental or quasi-experimental studies published between the years of 1980 and 1998 and that used measurements to examine the effects of instructional treatments on language acquisition. The results showed that second/foreign language instruction had a positive effect on language learning (d = 1.00). The results also showed that the instructional treatments seemed to have a larger effect when the measures were selected response or constrained constructed response formats. On the other hand, treatments had a small effect when the measures were meta-linguistic judgments or free response tasks.

2.8 Conclusion

The review of literature in this chapter provided a theoretical background for the meta-analysis that will be conducted. Studies that examined the effect of textual input enhancement and explicit rule presentation have shown contracting results. Therefore, I chose a meta-analysis methodology to synthesize information across different studies. In the following chapter, the methodology of the study will be discussed. The chapter will start with the criteria followed for the inclusion and the exclusion of the study reports.

Then, it will present the procedure that will be used to collect and code the studies. It will also provide the process used in statistically synthesizing the results of individual study reports.

CHAPTER III

METHODOLOGY

3.1 Introduction

This chapter describes the methodology followed in this study. It includes a description of the process used in collecting and coding the studies reported in this metaanalysis. It also presents the formulas that will be used in calculating the effect sizes of the retrieved studies.

3.2 Retrieval of Research Studies

In meta-analysis research, the secondary researcher tries to retrieve an entire population of studies that have examined the targeted variables. Therefore, to locate the studies that have examined the effect of textual input enhancement and/or explicit instruction on the "noticing" and/or acquisition of grammar in a second/foreign language context, I performed an extensive search of the literature. I checked online databases from the years of 1980 to 2010 using a combination of the following search terms: (focus on form, input enhancement, textual enhancement, typographical enhancement, implicit/incidental learning/teaching/instruction, effect of second/foreign language instruction, explicit learning/teaching/instruction) and (attention to grammar, noticing of grammar, grammar teaching/learning).

According to In'nami and Koizumi (2010), collecting studies in a meta-analysis should not be limited to one database. In'nami and Koizumi (2010) have examined databases that were commonly used in meta-analyses in applied linguistics

and which combinations of these databases appeared most frequently. They answered these two questions by looking at the databases that were checked in all the metaanalyses conducted in the field of applied linguistics (for an explanation of the process used in retrieving the meta-analyses see In'nami & Koizumi, 2010). The authors found that the following databases were the most commonly used: ERIC (appeared in 12 metaanalyses, LLBA (Linguistics and Language Behavior Abstracts appeared in seven metaanalyses), ProQuest Dissertations and Theses (appeared in five meta-analyses) and PsycINFO (appeared in seven meta-analyses). In addition, In'nami and Koizumi (2010) found that a combination of two or three of these databases was very frequent in the examined meta-analyses. In fact, they suggested the use of these four databases in future meta-analyses. In'nami and Koizumi (2010) also wanted to know which of these databases provides a complete coverage of the journals in applied linguistics. They checked 24 journals that are very common in the field of applied linguistics (for a list of these journals see In'nami & Koizumi, 2010) to see which databases host these journals. The authors found that LLBA covered all the 24 journals, ERIC and MLA covered 22 of these journals, Linguistics Abstracts covered 20 and finally Scopus covered 18.

Therefore, in this meta-analysis, I chose to search the most frequently used databases by previous meta-analysts (ERIC, LLBA, ProQuest Dissertations and Theses and PsycINFO). This collection includes the database that covers the most frequently used journals in the field of applied linguistics (LLBA). The total then became three databases that cover journal articles and published studies and one database that covers theses and dissertations. In addition to online databases, I also checked manually the following journals from the years of 1980 to 2010 *Applied Language Learning, Applied*

linguistics, Applied Psycholinguistics, Canadian Modern Language Review, Language Learning, Language Teaching Research, The Modern Language Journal, RELC Journal, Second Language Research, Studies in Second Language Acquisition, System and TESOL Quarterly. Moreover, I checked chapters, footnotes and references of five edited books: Doughty and Williams (1998), Han (2008), Odlin (1994), Schmidt (1995) and Singleton and Lengyel (1995).

A complete synthesis of research means including published and unpublished research studies (Cooper, 2010). This is because there is bias in published research. The reason behind that is that significant findings are more likely to be published than non-significant findings. This problem is called the 'file-drawer' problem (Rosenthal, 1979). That is why it is important to include unpublished studies in the meta-analysis. However, this study includes only published articles, theses and dissertations (see limitations section in Chapter V). Therefore, it is possible that there are other unpublished studies that have examined the effect of textual input enhancement and/or explicit instruction on second/foreign grammar "noticing" and/or acquisition that are not included in this meta-analysis. Examples of this fugitive research are manuscripts in conference proceedings (e.g. Wijaya, 2000).

3.3 Criteria for Inclusion

The criteria for inclusion and exclusion of research studies depend on the questions asked in the meta-analysis (Field & Gillet, 2010). The questions in this study were:

1. Does textual input enhancement have an effect on grammar noticing/acquisition in an ESL/EFL context?

- 2. Does explicit rule presentation have an effect on grammar noticing/acquisition in an ESL/EFL context?
- 3. Which one of these two kinds of input enhancement has a higher effect?

Therefore, studies included in this meta-analysis met the following inclusion and exclusion criteria. First, the studies included were experimental or quasi-experimental that used a pre-test/post-test design to measure the effects of textual input enhancement and/or explicit instruction on "noticing" and/or acquisition of second/foreign grammar structures in an ESL/EFL context. Therefore, descriptive or correlational studies (e.g. Ellis, et al., 2001; Lightbown & Spada, 1990; Oliver & Mackey, 2003), studies that did not employ a pre/post test design (e.g. Alanen. 1995; Jourdenais et al., 1995; Overstreet, 2002), studies on first language acquisition or "noticing" (e.g. Lorch et al., 1995) or studies that compared the performance of L2 learners to native speakers (e.g. Gor & Cook, 2010; White, et al., 1991) were excluded. In addition to that, studies that studied the effect of these two variables on language gain, in general (e.g. Kim & McDonough, 2008; Sheen, 2004, 2006) skills other than grammar, for example vocabulary (e.g. Morimoto & Loewen, 2007; Nassaji, 2003), phonology (e.g. Trenchs-Parera, 2009) or oral communication (e.g. Nakatani, 2005) were also excluded. However, studies that examined grammar in addition to other skills such as vocabulary (e.g. Grim, 2005) were included. Moreover, studies that examined the effect of textual enhancement or explicit instruction and these two variables were the main variables along with other variables such as topic familiarity (e.g. Lee, 2007) or simplification (e.g. Wong, 2003) were also included. The analysis, however, will only look at the related variables to the current

study (textual enhancement and explicit instruction) and test their effect only on grammar noticing/acquisition.

The second criterion concerns the language and years of publication. The reported studies were the ones written in English and published between the years of 1980 and 2010. That excludes Simard (2001) that studied the effect of textual enhancement but was written in French. The third criterion is the use of comparison or control groups. Therefore, studies that used the textual enhancement or explicit instruction treatment in comparison groups (e.g. Sato, 2005 as a textual enhancement study) or studies that presented all the groups with explicit instruction (e.g. Benati, 2001; Kanda & Beglar, 2004; VanPatten, 1996) were excluded.

Furthermore, studies included were published studies only. Figurative resources (e.g. Wijaya, 2000) were not included. Another criterion is sufficient data for the calculation of effect sizes. So, the studies that did not report sufficient data to calculate the effect size (e.g. Leeman et al., 1995; Shook, 1994) were excluded. In addition, the reported studies studied the effect of textual enhancement and/or explicit instruction on the "noticing" and/or acquisition of natural and specific grammatical structures by subjects who have no apparent learning disabilities. That excludes the studies that tested artificial structures (e.g. Hulstijn, 1989; Robinson, 1996), studied the effect of grammar gain in general (e.g. Macaro & Masterman, 2006) or reported subjects with learning disabilities (e.g. Berent & Kelly, 2008; Finestack & Fey, 2009). The last criterion concerns textual input enhancement studies. The textual enhancement studies were the studies that used reading tasks. Studies that used single-sentence reading tasks (e.g. J. Williams, 1999) were excluded. This is because this study aims at examining the textual

enhancement studies that used textual enhancement to measure "noticing" and/or acquisition in a meaningful setting using natural reading tasks.

It should be noted that if the same study was reported across several sources, only one report is included. For example, if a study (e.g. Doughty, 1991; Izumi, 2002; White, 1998) and a dissertation (e.g. Doughty, 1988; Izumi, 2000; White, 1996) tested the same variables on the same subjects using the same treatments and measurements, the former (article) was included but the dissertation was referred to in case of missing data. In addition, if two identical articles were published in two different journals (for example, Rosa & Leow, 2004 published in *Applied Linguistics* and in *The Modern Language Journal*), only one report was included.

3.4 Coding Study Reports

After the retrieval of relevant studies and the exclusion of the studies that did not meet the inclusion criteria, the third step is to develop a coding sheet to identify the common characteristics among the different studies included in this meta-analysis. Though the coding scheme depends on the nature of the study itself, Cooper (2010) identified some common categories that should be included in every coding sheet. Every coding sheet should include the variables of investigation, setting, participants' characteristics, research design and statistical information of every individual study. The coding sheet for this study will include all the previously mentioned categories in addition to publication characteristics. Therefore, the coding sheet is divided into five main sections.

The first section concerns the publication characteristics of the retrieved studies. This includes the background information of each study: author(s), title, kind of

publication (a journal article, a study from an edited volume, a thesis or a dissertation), year of publication and journal or book it was retrieved from. The second section is the variables reported in the studies. The current study has two independent variables (textual input enhancement and explicit instruction). I coded studies as having a textual enhancement treatment if they used one or more of the textual enhancement techniques (see Chapter II) either implicitly without asking the learners to pay attention to the target form(s) or explicitly when the researcher(s) asked the learners to look at the enhanced form(s) but with no meta-linguistic explanation provided. On the other hand, I coded studies as having explicit treatments when the researcher either provided rule explanation of the target grammatical structure(s) or gave meta-linguistic feedback orally or in a written form. The dependent variables in this study were "noticing" and/or comprehension of the target grammatical form(s). I divided the measures of these dependent variables into two main categories: receptive and productive. The first category refers to meta-linguistic judgments when the subjects judged the accuracy of the grammatical form(s). The second category (productive) was divided into two subcategories: free constructed and constrained constructed tasks. The difference between these two is the amount of guidance given to the subjects. For example, I coded picture description and free written recall tasks as free constructed tasks while I coded short answer tasks as constrained constructed tasks.

Besides coding the publication characteristics and dependent and independent variables, I coded come methodological features that focus on two categories: learner characteristics and research design. These are the third and fourth sections in the coding sheet. The learner characteristics category includes five subcategories: age of

participants, number of participants in each study as well as number of participants in each group, the proficiency level of the participants and how it was measured in the studies, the participants' knowledge of the target grammatical form(s) and finally the learning context of the participants whether it was a second language context or a foreign language context. As for research design, I divided this category into four subcategories: target language, number of target forms, treatment sessions and materials used in treatments and pre/post tests. I divided the treatment category into number of treatment sessions, duration of each treatment session, amount of time between pre-test and treatment and between treatment and post-test and finally the total amount of time of the treatment session(s). The materials category included task type and length and amount of time spent on these tasks.

The last section in the coding sheet is the statistical information section. This section includes the statistical results reported in the studies: mean, standard deviation, t test or F test scores and the p value. I coded the results of each study individually to calculate the effect size of the treatment(s) in each study.

3.5 Calculating the Effect Size

Until recently, research synthesists used to interpret data in the primary research depending on intuitive rules that are not known even to them. "Analysis methods were idiosyncratic to the perspective of that particular synthesist. Therefore, a description of the common rules of inference used in research syntheses was not possible." (Cooper, 2010, p. 147). Because the methods that synthesists used were unreliable, the results of their research were also unreliable. That led methodologists to develop more reliable methods that could be used to interpret data from the primary studies.

To examine the relationship between the dependent and independent variables in each study, the effect size will be calculated. As explained in Chapter I, the effect size measures the impact of an intervention. Cohen (1988) defines effect size as "the degree to which the phenomenon is present in the population". This definition could also mean "the degree to which the null hypothesis is false" (Cohen, 1988, p. 9-10). Effect size has different metrics that describe the strength of the relationship between the variables: *d*index, *r*-index and *odds ratio*. The decision on which one to use depends on the characteristics of the variables under investigation. Since the aim of this meta-analysis is to measure the effect that the independent variable has on the dependent variable, the first metric (the *d*-index) is the one that is used to calculate the effect size (for an explanation of the other two metrics, see Cooper, 2010).

The *d*-index is the standard mean difference measure that is used when the researcher wants to measure the difference between two means or in other words to compare two groups or experimental conditions. It is calculated by dividing the difference between the mean score of the treatment group and the mean score of the control group by the pooled standard deviation. The formula is as follows:

$$d = \frac{X_1 - X_2}{SD}$$

Where:

 X_1 and X_2 represent the mean scores of the treatment group and the control group respectively.

SD represents the pooled standard deviation of both groups. To calculate the *SD*, the following formula has been used:

$$SD = \sqrt{\frac{(N1-1)SD1 + (N2-1)SD2}{N1+N2}}$$

Where:

 SD_1 and SD_2 represent the standard deviation of the treatment group and the control group respectively.

 N_1 and N_2 represent the sample size in the treatment group and the control group respectively.

In some studies, primary researchers did not provide the mean and standard deviation scores of the groups but provided the t test or the F test scores. In this case, another formula is used to calculate an approximate d-index:

$$d = \frac{2t}{\sqrt{df}}$$

Where:

t is the value of the *t* test.

 df_{error} represents the degrees of freedom associated with the error term of the *t* test ($n_1 + n_2 - 2$).

When the F test score is provided, the same formula is used substituting the t test value with a square F value but only when the df value is single.

3.6 Conclusion

The chapter presented a detailed description of the criteria used in including and excluding the reported studies. The chapter also provided how I coded the studies. It concluded with the formulas that will be used in calculating the effect sizes of each included study. The next chapter will present the results of the meta-analysis. Then, the last chapter will discuss these results.

CHAPTER IV

RESULTS

4.1 Introduction

To synthesize the results of the retrieved studies, this chapter provides a comparison among these studies. Areas of comparison are publication, subjects, study design and analysis of research findings. Each one of these areas has a separate section that presents in detail the comparisons among the retrieved studies. The last section in this chapter displays the results of the quantitative meta-analysis of this study. It discusses the statistical analyses used to interpret the data. A thorough discussion of the results will be presented in the next chapter.

4.2 Publication Characteristics

Over 300 articles and 40 theses and dissertations that studied the effect of textual enhancement or explicit instruction on second/foreign language learning were retrieved from the literature. However, only 39 studies (23 journal articles, three studies from edited volumes, one thesis and 12 dissertations) met the inclusion and exclusion criteria for the current study. Of the 39 retrieved studies, 23 articles were retrieved from 11 different journals (see appendix A). I divided the retrieved studies into three kinds: studies that examined the effect of textual enhancement (11 studies), studies that examined the effect of both treatments on separate groups (three studies) and studies that tested the effect of both treatments on the same group (Heo, 2007). This is actually the only retrieved study

that tested the effect of both treatments on the same group and, therefore, I reported that study twice once in the textual enhancement study reports and the other time in the explicit instruction study reports. It seems that explicit instruction has been examined more that textual enhancement across the years (see figure 1 for publication frequency). In addition, a large number of studies aimed at examining the effect of textual enhancement or explicit instruction along with the effect of other treatments such as content familiarity, language experience, input flood, feedback, language aptitude, output, task types or input processing tasks. However, in this meta-analysis, I will compare only the groups that were exposed to textual enhancement treatment or explicit instruction treatment (see research analysis section).



4.3 Learner Characteristics

Different kinds of learners were involved in the studies that examined the effects of textual enhancement and/or explicit instruction on noticing/acquisition of target grammatical forms. The learners differed in their ages, first languages, proficiency levels and previous knowledge of the target structures. They also differed in their learning contexts and target languages as we will see in the research design section.

It seems that the majority of the studies reported adult subjects. Only in one study the participants were children (grade six students) and in three studies the participants were high school students. However, in the rest of the studies, the participants were adults who were enrolled in ESL programs or writing programs or who were taking undergraduate courses at colleges or universities. Not all studies mentioned the proficiency level of the subjects. Of the 39 studies, only 19 reported the proficiency level of the subjects. Three studies examined advanced level participants, eight studies reported intermediate level subjects and two studies had basic level subjects. Other studies examined the influence of the independent variables on more than one level of subjects. For example, one study had three levels of intermediate subjects (low, mid and high intermediate subjects), one examined advanced, intermediate and beginners, two studies reported intermediate and advanced level subjects and one study tested beginning and intermediate subjects. Finally, one study mentioned two levels of proficiency: low and high. The rest of the studies either neglected to mention the level of the subjects (seven studies) or provided some information about the level of the language courses that the subjects were taking

Thirteen studies stated the courses that the subjects were taking at their colleges or universities, for example, first year/semester Spanish course. I used this information to predict the proficiency level of the subjects. Therefore, I assumed that subjects in their first or second level of study of the target language were beginning students (in seven studies), those who were in their third or fourth semesters were medium level subjects (in three studies) and the ones who were studying in a level five or above classified as high level participants (in one study). Two studies reported subjects with two levels low and medium. As mentioned above, seven studies neglected to mention the proficiency level of the subjects and did not provide information that could be used to estimate the proficiency level (see appendix B for information on the learners' age and proficiency level in each study).

Not all the studies that reported the proficiency level of the subjects provided proficiency measurements that the researchers relied on. In fact, only four studies reported proficiency measurements. Three of these studies used well know proficiency tests. For example, one study reported using the Michigan English Language placement test or sub-scores of that test and another one assigned the subjects to different levels of proficiency according to their IELTS scores. The third study used the TOEFL scores of the participants as a screening process to decide which subjects should be included. Finally, one study used departmental developed materials to assess the proficiency level of the subjects.

4.4 Study Design

Some of the retrieved studies tested homogenous groups of subjects in terms of their first language (16 studies), others targeted participants with different first languages

(15 studies). Eight studies did not mention the background of the subjects (see table 1 for information on the subjects' background across the studies). In fact, the retrieved studies did not only test different learners but also targeted different languages and form(s) in different contexts. English was the most examined target language appeared in 20 studies followed by Spanish and French that were examined in eight studies, Japanese studied twice and finally Chinese examined once. The majority of the studies examined one target form (23 studies), some examined two (13 studies), two studies tested four target forms and one study tested 12 target forms. Six of the studies that tested more than one target form used different groups for the different forms while ten studies used the same groups for the same forms. It should be noted that the studies that examined the effect of the different target forms using different groups were considered as having two study reports. This means that the total number of the studies is 39 but the total number of the study reports is 45.

Not all the examined target form(s) were new to the subjects. Only 12 studies showed that the subjects had little or no knowledge of the target form(s) according to their pre-test scores and/or answers to questionnaires. On the other hand, 10 studies showed that the subjects were familiar with the target form(s) and that was the aim behind the selection of the target form(s) or the subjects; to be familiar with the target form. Seventeen studies neglected to mention whether the participants were familiar with the form(s) or not (see appendix B for information on the learners' previous knowledge in each study). The subjects in these studies were either EFL or ESL learners. However, it seems that the majority of the contexts of the studies were EFL contexts (26 studies) while ESL contexts appeared in only 13 studies.

All the 39 studies reported the number of the subjects. That number differed across the studies. It ranged from fewer than 50 subjects (12 studies), more than 50 but fewer than 100 subjects (18 studies) and more than 100 subjects (9studies). In fact, De Santis (2008) was the study that had the least number of subjects (total number was 15) while Lee (2007) had the largest number (259 subjects). In addition to the total number of subjects, all the studies except for three reported the N size of each group included.

Table 4.1.

First Language	Number of Studies	First Language	Number of Studies
Afrikaans	1	Italian	2
Arabic	7	Japanese	14
Bengali	1	Khmer	1
Bulgarian	1	Korean	14
Chinese	12	Malay	2
Czech	1	Portuguese	3
English	17	Romanian	2
Farsi	5	Russian	5
Filipino	1	Spanish	11
French	7	Tamil	2
German	1	Thai	4
Hebrew	1	Turkish	3
Indian	5	Vietnamese	4
Indonesian	4		

Number of First Languages across the Studies

The majority of the studies divided the groups randomly (27 studies). On the other hand, only few studies used the subjects' pre-test scores (two studies) and the TOEFL scores (one study) to divide the subjects into groups with similar levels. Nine studies neglected to mention on what basis the researcher(s) divided the groups. At least two kinds of groups appeared in each study: experimental group and comparison/control group. Not all the studies used true control groups that did not receive any treatment. Of

the 39 studies, only 12 studies used true control groups that were not exposed to the target form(s) at all and that only participated in the assessment tasks (see appendix B for information on the kind of group used in each study).

The treatments were either held in classes (22 studies), in labs through computers (14 studies) or individually with the researcher (three studies). The number of treatments also differed across the studies. Twelve studies used only one treatment session while ten studies used two treatment sessions, 16 studies used three or more sessions and one study neglected to mention the number or the length of the treatment sessions. The time length of the testing process was not always reported in the studies. Not all studies reported the time length between the pre-test and the treatment(s), between the treatment(s) and the post-test or the whole testing process. Three studies used the pre-test on the same day that the treatment was conducted while others used them days (eight studies), weeks (15 studies) or months (one study) prior to the treatment. Fifteen studies measured the post effect of the treatment immediately or few days after the treatment(s) (ten studies). On the other hand, some studies kept a more time interval that lasted for weeks (four studies) or months (three studies) after the treatment(s). It is also worth mentioning that 21 studies used a second post-test that sometimes took place weeks (eight studies) or months (11 studies) after the treatment(s) (see appendix B for number of treatments and duration of treatments in every study).

As mentioned in the publication characteristics section, 14 studies examined the effect of textual enhancement on "noticing" and/or acquisition of the target form(s) and one study examined the effect of textual enhancement along with explicit instruction. Each one of these studies used different enhancement techniques using passages that

differed in their length and number of target forms (see table 2 for passage length, number of tokens and enhancement technique(s) in every textual enhancement study). When looking at the passages that the researcher(s) used in their studies, I found that in four studies the researchers adapted the reading texts from reading books while in one study the researcher adapted the text from a magazine. In addition, in two studies, the researchers adapted the passages from previous studies. On the other hand, in one study, the researcher developed the passages. Six studies neglected to mention whether the passages were adapted or developed.

Table 4.2.

Length of Passages, Number of Tokens and Enhancement Techniques across the Textual Studies

Study	Length of Passage(s)	Number of	Enhancement
		Tokens	Technique
De Santis (2003)	291	32	Boldface,
			enlargement and
			coloring
Doughty (1991)	n.t	n.t	Capitalization and
			highlighting
Grim (2005)	About 500	About 150 for	Boldface and
		each rule	coloring
Ha (2005)	6673	About 2000	Boldface and
			underlining
Hayer (1997)	Over 1000	Over 500	Boldface and italics
Heo (2007)	About 1500	About 1000	Capitalization
Izumi (2002)	890	46	Boldface, different
			fonts, enlargement,
			shadowing and
			underlining
Jourdenais (1998)	Over 1000	72	Boldface,
			enlargement and
			underlining
Kubota (2000)	About 248	24 for each rule	Boldface, shadowing
			and underlining
Lee (2007)	n.t	36	Boldface,
			enlargement and

			different font
Leow (2001)	242 words	17	Boldface and
			underlining
Leow et al. (2003)	n.t	10	Boldface,
			enlargement and
			underlining
Overstreet (1998)	210 words	28	Boldface,
			enlargement,
			shadowing and
			underlining
White J. (1998)	n.t	n.t	Boldface,
			enlargement, italics
			and underlining
Wong (2003)	1508 words	48	Boldface,
			enlargement, italics
			and underlining
37			

Note. n.t = not mentioned

The retrieved studies examined the effect of textual enhancement, explicit instruction or both treatments on the "noticing", acquisition or noticing and acquisition of the target form(s). The decision of which depended variables were tested in each study relied on the research questions provided in the primary studies. According to the research questions, 31 studies examined the effect of textual enhancement and/or explicit instruction on the acquisition of target form(s) and eight studies examined the effect on "noticing" and acquisition. The studies measured the "noticing" variable using thinkaloud protocols (appeared in five studies) or questionnaires (used in seven studies). The measurement of the acquisition variable was either receptive or productive. The first category refers to meta-linguistic judgments when the subjects judged the accuracy of the grammatical form(s) (used in 18 studies). The second category (productive) refers to free production tasks and constrained production tasks. The difference between these two is the amount of guidance given to the subjects.

The free production measurements used in these studies were composition tasks (used in four studies), free written or oral recall tasks (four studies), picture description

tasks (11 studies) and translation tasks (two studies). On the other hand, the constrained production tasks were: interviews (used in two studies), fill in the blanks tasks (15 studies), matching tasks (four studies), multiple choice questions (14 studies), sentence combination tasks (three studies), sentence rewriting tasks (four studies), short answer questions (five studies), spot the difference tasks (two studies) and true/false questions (one study). Most of the studies used the same set of measurements for the pre and the post tests. Six studies used the same versions of the pre-tests in the post-test(s). On the other hand, 21 studies used the same kind of measurement(s) but with a different version in the post-test(s). Two studies used same and different versions of the pre-tests. Four studies neglected to mention whether the versions of the pre-tests and the post-tests were the same or different. On the other hand, six studies used a set of measurements in the pre-test but chose only a number of these to be included in the post-tests and added some other types of measurements that were not used in the pre-tests. In fact, two studies (Kubota, 2000; Li, 2009) used completely different sets of measurements in the pre-tests and the post-tests.

4.5 Research Analysis

The retrieved studies were experimental or quasi-experimental studies and, therefore, all the primary researchers used quantitative analyses to examine the effect of the variables. However, in some studies, primary researchers used also some descriptive strategies such as think-aloud protocols (in five studies) or questionnaires presented after the treatment (in seven studies). The primary researchers used a variety of strategies to evaluate the measures of performance: dichotomous criteria (correct or incorrect),

polytomous criteria (subjective ratings), suppliance frequency counts and/or error frequency counts.

It is worth mentioning that the studies always reported the performance of the subjects as an average outcome at the group level except for Doughty (1991) that provided mean scores for individual subjects and average scores for each group. Most of the studies reported means and standard deviations of the subjects' performance on pretests and post-tests (32 studies). The rest of the studies either reported t scores (six studies) or F scores (one study). All the studies described the measurements of the subjects' performance which represent the measurements of the dependent variables (described in the study design section above). In fact, most of the studies presented examples of these measurements, number of items in each measurement, duration of time subjects were allowed to finish each measurement and whether the same version of the measurement was used in both tests (pre and post) or another version was used (discussed above).

Primary researchers used different statistical tools (ANCOVA, ANOVA, MANOVA, chi square tests, Mann Whitney U test, post hoc tests, *t* tests) to analyze and report the results of the studies. Most of the time, studies used a combination of these tools. The most commonly used combination was ANOVA and *t* tests. The primary researchers always reported which analytic tool they used and discussed the findings of their studies sometimes in general and other times by referring to every research question addressed at the beginning of the research. Furthermore, in almost half of the studies (22 studies), the primary researchers used graphic techniques (for example, figures) to display the results of their studies.

4.6 The Quantitative Meta-analysis

To measure the effect of different treatments discussed in this study (textual enhancement and explicit instruction) on the noticing/acquisition of target grammatical forms, I calculated effect sizes from individual studies following the formulas presented in Chapter III. As mentioned before, most of the studies provided mean and standard deviation values for the pre and post tests. I calculated the effect sizes of these studies by using the mean and standard deviation values of the experimental groups and the control or comparison groups of each first post-test and each second post-test if provided. Then, I calculated the average of the effect sizes of the first and the second post-tests for each study (see table 3 for textual enhancement study reports effect sizes and table 4 for explicit instruction study reports effect sizes). I also calculated the pre-post treatment effect size to measure how much of the effect size is actually due to the treatment. For the studies that did not provide mean or standard deviation values, I calculated their effect sizes by using the t test scores (six studies) or the F test scores (one study) that compared the experimental groups to the control groups. These studies did not provide sufficient information to calculate the pre-post effect size value. In addition to these studies, one study (Wu, 2008) did not provide standard deviation scores of the experimental group in the pre-test and, therefore, the pre-post effect size was not calculated.

Table 4.3.

Study	Post-Test 1 Effect	Post-Test 2 Effect	Average
	Size	Size	Effect Size
De-Santis (2008)	2.15	1.83	1.99
Doughty (1991)	0.45	n.a	0.45
Grim (2005)1	0.55	0.44	0.50
Grim (2005)2	0.15	0.04	0.10
Ha (2005)	0.14	n.a	0.14
Hayer (1997)	1.43	n.a	1.43
Heo (2007)	0.23	n.a	0.23
Izumi (2002)	-0.18	n.a	-0.18
Jourdenais (1998)	0.05	-0.01	0.02
Kubota (2000)1	-0.37	-0.43	-0.40
Kubota (2000)2	-0.10	-0.20	-0.15
Lee (2007)	0.34	n.a	0.34
Leow (2001)	0.51	n.a	0.51
Leow et al. (2003)1	-0.22	n.a	-0.22
Leow et al. (2003)2	-0.22	n.a	-0.22
Overstreet (1998)	0.03	n.a	0.03
White (1998)	0.25	-0.05	0.10
Wong (2003)	0.26	n.a	0.26
Average	0.30	0.23	0.27

Post 1 and post 2 Effect Sizes for Textual Enhancement Study Reports

Note. n.a = not available

Table 4.4.

Post 1 and post 2 Effect Sizes for Explicit Instruction Study Reports

Study	Post-Test 1 Effect Size	Post-Test 2 Effect Size	Average Effect Size
Akakura (2009)	0.63	0.83	0.73
Ayoun (2001)	-0.19	n.a	-0.19
Bitchener and Knoch (2008)	1.20	1.15	1.18
Brender (2002)	0.54	n.a	0.54
Doughty (1991)	-0.07	n.a	-0.07
Ellis et al. (2006)	0.58	1.12	0.85
Erlam (2003)	1.49	0.74	1.12
Fotos and Ellis (1991)	3.19	1.65	2.42
Haight (2008)	-0.45	-0.04	-0.25

Hayer (1997)	1.47	n.a	1.47
Heo (2007)	0.23	n.a	0.23
Kubota (1994)	0.03	0.44	0.24
Kubota (2000)1	0.79	0.89	0.84
Kubota (2000)2	1.28	0.91	1.10
Li (2009)	0.68	0.35	0.52
Master (1994)	1.20	n.a	1.20
Melendez (1993)	3.22	1.50	2.36
Robinson (1997)	0.45	n.a	0.45
Rosa and Leow (2004)	2.19	1.49	1.84
Rosa and O'Neil (1999)	0.68	n.a	0.68
Sanz and Morgan (2004)	-0.19	n.a	-0.19
Sato (2005)	0.51	-0.48	0.02
Scott (1989)1	0.71	n.a	0.71
Scott (1989)2	1.22	n.a	1.22
Scott (1990)1	0.65	n.a	0.65
Scott (1990)2	0.81	n.a	0.81
Sheen (2007)	0.63	0.95	0.79
Sheen (2010)	0.72	0.94	0.83
Tanaka (1996)	1.72	0.44	1.08
Williams and Evans (1998)1	1.59	n.a	1.59
Williams and Evans (1998)2	1.32	n.a	1.32
Wu (2007)	0.89	n.a	0.89
Average	0.93	0.81	0.84

Note. n.a = not available

When looking at the average effect size of studies, it seems that textual enhancement had a low average effect size (d = 0.30). On the other hand, explicit instruction had a high effect size value (d = 0.93). In addition, when looking at the individual effect sizes of individual explicit instruction studies, the majority of the studies seemed to have a high effect size. Eleven studies had a medium effect size (above 0.5 but less than 0.8) and 14 had a high effect size (above 0.8). In fact, 12 of these studies showed an effect size that is above 1.00 while only three studies showed a low effect size value (below 0.5) and four studies had a negative effect size. On the other hand, textual enhancement studies all except for De Santis (2008) and Hayer (1997) that reported very high effect size values (d = 2.15) and (d = 1.43) respectively and Grim (2005) and Leow (2001) that showed a medium value had either a low effect size value (nine studies) or a negative effect size value (five studies). Thirteen studies examined the effect of textual enhancement while 27 studies tested the effect of explicit instruction, four examined the effect of both treatments but on separate groups. Only one study tested the effect of both treatments on the same group and this study did not show a high effect size value (d =0.23) for the effect of both treatments on grammar acquisition.

It should be noted that the above-mentioned effect sizes represent the effect of the treatments (textual enhancement and/or explicit instruction) on acquisition. This is because only eight studies examined noticing and only five of them provided separate values for the effect of the treatment on acquisition and the effect of the treatment on noticing. The treatment in these five studies (Ha, 2005; Izumi, 2002; Leow, 2001; Leow et al., 2003; Jourdenais, 1998) was textual enhancement and the average effect size of that treatment on noticing was low (d = 0.43). In addition, three of the eight studies (Leow, 2001; Leow et al., 2003; Robinson, 1997) tested the effect of noticing caused by the treatment (textual enhancement or explicit instruction) on the intake of the target form(s). However, only one of them (Robinson, 1997) provided values that could be calculated into an effect size. The effect size of this study was actually low (d = 0.14). The treatment in this study was explicit instruction. The other two studies (Leow, 2001; Leow et al., 2003 which were textual enhancement studies), on the other hand, provided values that cannot be calculated into an effect size (z scores) (see limitations section in Chapter V).

In addition to the post-test effect size, I calculated the pre-post effect size difference to examine how much of the effect size value is due to the treatment. This difference represented values that are caused by the treatment (see table 5 for pre-post difference for textual enhancement studies and table 6 for pre-post difference for explicit instruction studies). In these two tables, one could notice that some studies did not provide enough information that contributed to the calculation of such a difference. Some studies reported t test scores (Leow, 2001; Leow et al., 2003; Fotos & Ellis, 1991; Master, 1994; Scott, 1989; Scott, 1990) while one (Robinson, 1997) provided F test scores. In addition, two studies used different tests in the pre-test form the post-test (Kubota, 2000; Li, 2009) and calculating a pre-post difference in this case would have been impossible due to the different kind of measurement used during both periods of time (pre and post exposure to treatment). It is also worth mentioning that four studies (Haight, 2008; Lee, 2007; Overstreet, 1998; Wong, 2003) used the same tasks used in the pre-tests but added more tasks during the post-test period. The calculation of the pre-post effect sizes in this case looked only at the similar tests used in both periods. However, this was not possible in the case of one study (Ayoun, 2001) because the author provided one mean value and one standard deviation value for two tasks used in the pretest while she used only one of them in the post-test. That made it impossible to look only at the same measurement used in both periods. In addition, Wu (2007) did not provided standard deviation values for the calculation of the pre-test. Moreover, in one study (Rosa and Leow, 2004), the subjects scored zero on the production task and, therefore, only the recognition task pre-test scores and post-test scores were compared.

Table 4.5.

		Post-Test 1 Effect	Pre-Post
Study	Pre-Test Effect Size	Size	Difference
De-Santis (2008)	-0.13	2.15	2.28
Doughty (1991)	-0.40	0.45	0.85
Grim (2005)1	0.02	0.55	0.53
Grim (2005)2	0.08	0.15	0.07
Ha (2005)	-0.05	0.14	0.19
Hayer (1997)	0.31	1.43	1.12
Heo (2007)	0.01	0.23	0.22
Izumi (2002)	-0.21	-0.18	0.03
Jourdenais (1998)	-0.08	0.05	0.13
Kubota (2000)1	n.a	n.a	n.a
Kubota (2000)2	n.a	n.a	n.a
Lee (2007)	0.18	1.30	1.12
Leow (2001)	n.a	n.a	n.a
Leow et al. (2003)1	n.a	n.a	n.a
Leow et al. (2003)2	n.a	n.a	n.a
Overstreet (1998)	-0.09	-0.13	-0.03
White (1998)	0.10	0.25	0.15
Wong (2003)	0.11	0.24	0.13

Pre-Post difference for Textual Enhancement Study Reports

Note. n.a = not available

Table 4.6.

Pre-Post Difference for Explicit Instruction Study Reports

Study	Pretest Effect Size	Post-Test 1 Effect Size	Pre-Post Difference
Akakura (2009)	0.09	0.63	0.54
Ayoun (2001)	n.a	n.a	n.a
Bitchener and Knoch (2008)	0.25	1.20	0.95
Brender (2002)	-0.18	0.54	0.72
Doughty (1991)	-0.84	-0.07	0.77
Ellis et al. (2006)	0.59	0.58	-0.01
Erlam (2003)	0.12	1.49	1.37
Fotos and Ellis (1991)	n.a	n.a	n.a
Haight (2008)	-0.09	-0.04	0.05
Hayer (1997)	0.50	1.47	0.97

Heo (2007)	0.01	0.23	0.22
Kubota (1994)	0.41	0.03	-0.38
Kubota (2000)1	n.a	n.a	n.a
Kubota (2000)2	n.a	n.a	n.a
Li (2009)	n.a	n.a	n.a
Master (1994)	n.a	n.a	n.a
Melendez (1993)	0.03	3.22	3.19
Robinson (1997)	n.a	n.a	n.a
Rosa and Leow (2004)	-0.07	1.49	1.56
Rosa and O'Neil (1999)	-0.51	0.68	1.19
Sanz and Morgan (2004)	-0.03	-0.19	-0.16
Sato (2005)	-0.28	0.51	0.79
Scott (1989)1	n.a	n.a	n.a
Scott (1989)2	n.a	n.a	n.a
Scott (1990)1	n.a	n.a	n.a
Scott (1990)2	n.a	n.a	n.a
Sheen (2007)	0.05	0.63	0.58
Sheen (2010)	0.11	0.72	0.61
Tanaka (1996)	-0.05	1.72	1.77
Williams and Evans (1998)1	-0.01	1.59	1.60
Williams and Evans (1998)2	0.61	1.32	0.71
Wu (2007)	n.a	n.a	n.a

Note. n.a = not available

When looking at the pre-test effect size value for each explicit instruction study and comparing it to the first post-test effect size value, it can be said that the subjects seemed to benefit from the treatment. This of course excludes three studies (Ellis et al., 2006; Kubota, 1994; Sanz & Morgan-Short, 2004) that showed a negative effect of the treatment on the subjects' performance in their first post-test. The same applies to the textual enhancement studies. Most of the studies showed that the subjects made some progress (if not very significant) between the pre-test and the post-test. However, (Overstreet, 1998) showed a negative effect of the textual enhancement treatment on the first post-test. To provide some statistical trustworthiness of the produced effect sizes, I calculated 95% confidence intervals of the average effect size of each treatment (see figure 2). The confidence interval indicates the reliability of the effect size estimate. The lower and upper confidence limits for the mean are the interval estimate of that mean. The confidence interval for the explicit instruction studies ranges between medium to large effect size. On the other hand, the upper and lower confidence interval for the textual enhancement treatment ranges between low to medium effect size.



In addition to the calculating the effect size of different treatments on grammar "noticing" and/or acquisition, the study compared the effect sizes of the different individual studies. The reason behind this is to test the effect of other moderating variables such as age, proficiency level and previous knowledge of the subjects and number and duration of the treatment sessions on the "noticing" and/or acquisition of grammatical target structures. In addition, the study compared the effect sizes between studies that used true control groups and the studies that used comparison groups. Studies that used true control groups did not expose the subjects to the target form(s) at all or exposed them to different target grammatical structures and the subjects participated in pre and post test measurements. On the other hand, studies that used comparison groups exposed the subjects to the target forms in a meaningful context using meaningful activities (seven studies), input flood (15 study reports) or corrective feedback or recasting (two study reports each). In order to compare the effect sizes of the studies and these six different variables, I performed a t test or an F test depending on the number of categories in each variable.

The first moderating variable is the age variable. I only compared this variable in explicit instruction studies because textual enhancement studies examined only adults except for one study that examined children (White, 1998) and another one that examined high school students (Lee, 2007). Therefore, it was not possible to perform an *F* test on these studies. However, as for the explicit instruction studies, most of them examined adults except for two that examined high school students. The *t* test that compared the effect size of the treatment on the adult subjects to the effect size of the treatment on the high school students showed significant results (t = -3.950, df = 6.178, p = 0.007).

The next independent variable was proficiency level of the subjects. One would think that high level subjects would benefit more from the textual enhancement treatment than low level subjects. Comparing the effect size of the study reports that examined low and medium level subjects showed that there is no significant difference between the performance of medium level subjects and low level subjects (t = -0.925, df = 9.034, p = 0.378). Moreover, proficiency level seems not to make a difference in the performance of the subjects that tested low, medium and high level subjects (explicit instruction studies). An *F* test comparing the effect size of the explicit instruction treatment on the performance of three different proficiency level subjects (low, medium and high) showed no significant difference between the performance of these subjects (f = 1.3496, df = 3, p = 0.2854).

The subjects' previous knowledge of the target forms did not seem to have a significant effect on their performance. I compared the effect size of the studies that had subjects with some previous knowledge of the target forms and the effect size of the studies that examined subjects with almost no previous knowledge at all. The comparison did not show a significant difference. The results were not significant for textual enhancement studies (t = -1.278, df = 4.608, p = 0.261). The results were also not significant for explicit instruction studies (t = -1.531, df = 7.776, p = 0.165).

The fourth and fifth moderating variables compared across the studies were the number and duration of the treatments applied in each study. I classified the number of the treatments as one, two or three and more in both types of treatments (textual enhancement and explicit instruction). Similar to the above-mentioned variables, the number variable did not seem to have a significant effect on the performance of the subjects exposed to different number of treatments in the different studies (f = 0.645, df =2, p = 0.538 in textual enhancement studies and f = 0.645, df = 2, p = 0.538 in explicit instruction studies). I compared the duration of the treatment variable only in textual enhancement studies. This is because the treatment duration in the explicit instruction studies was always short except for one study (Wu, 2007) that applied a medium treatment and this is not enough to apply a comparison test. The comparison *t* test for the textual enhancement studies, on the other hand, comparing long treatments to short treatments showed no significant effect for such a variable on the performance of the subjects (t = -1.123, df = 11.73, p = 0.283).

The last moderating variable compared across the studies was the control versus comparison group. As mentioned above, not all studies used true control groups. Therefore, it was necessary to examine if the effect size of the studies that used true control groups is different from the effect size of the studies that used comparison groups in which the researchers exposed the subjects to the target form(s) using other instructional treatments. I compared the effect sizes of the textual enhancement treatments and the explicit instruction treatments that used control or comparison groups. The results of the *t* test showed no significant effect of this variable on either treatment (t = -1.429, df = 15.841, p = 0.172).

4.7 Conclusion

The chapter displayed a synthesis of the results of the retrieved studies. It compared 45 study reports in terms of publication, subjects, study design and analysis of research findings. Each one of these areas had a separate section that showed the comparisons among the retrieved studies in depth. In addition, the last section in this chapter
displayed the results of the quantitative meta-analysis. This section showed the effect size results, confidence interval values and the inferential statistical results. The next chapter will discuss the results of all of these tests, presents limitations of the study and provides some pedagogical implications and suggestions for future research.

CHAPTER V

CONCLUSION

5.1 Introduction

The last chapter in this study serves as a conclusion to the meta-analysis. It consists of three sections. The first section discusses the results presented in the previous chapter. This section presents a discussion of every research question in an attempt to confirm or reject the hypotheses of the study. The second section presents the shortcomings and limitations of this study. The last section provides some pedagogical implications for ESL/EFL teacher s as well as some suggestions for future researchers.

5.2 Discussion of Results

The main goal of this study was to examine if two instructional treatments (textual input enhancement and explicit instruction or what is sometimes referred to as explicit rule presentation) have a positive effect on the "noticing" and/or acquisition of target grammatical structures. The first research question examined whether or not textual enhancement of the grammatical structures in the target language would have an effect on the subjects' noticing/acquisition of these forms. As mentioned in Chapter IV, the average effect size of the retrieved study reports (18 study report) showed a low effect size (d = 0.30). The individual studies had either a low effect size value (nine studies) or a negative effect size value (five studies). That excludes De Santis (2008) and Hayer (1997) that reported a very high effect size values (d = 2.15) and (d = 1.43) respectively. It should be noted that of the 18 study reports, only five had true control

groups. This is because, as mentioned in the previous chapter, the retrieved studies compared the explicit instruction treatment and the textual enhancement treatment most of the time to comparison groups that engaged in meaningful activities or that received input flood, corrective feedback or recasting of the target form(s). In addition to the control/comparison variable, when comparing the performance of the subjects in individual studies prior to the treatment and after the treatment, it is obvious that the participants in almost all the studies that provided enough information of the pre-post treatment to be calculated made a progress from the pre to the post test. This of course excludes Overstreet (1998) in which the performance of the subjects was negatively affected. On the other hand, when looking at the seven studies that reported enough information for the calculation of the delayed pos-test, it is found that the subjects performance was negatively affected over the time (d = 0.23). However, it should be noted that the number of the study reports was less than half (seven out of 18). Generally speaking, I could say that the findings of the effect of this instructional treatment moderately support the first hypothesis which stated the textual enhancement would have a positive effect on the subjects' noticing/acquisition. This is because the average effect size was low and even the effect size of most of the individual study reports was either low or negative. This conclusion resembles the one Lee and Haung (2008) reached. In their meta-analysis (discussed in Chapter II), the authors reported a low effect size for the textual enhancement treatment. However, in this study, when comparing the pre-test and post-test scores, the treatment seemed to increase the subjects' performance.

The second research question examined whether or not explicit instruction of target grammatical forms would have an effect on the subjects' noticing/acquisition of

these forms. The average effect size of 32 study reports showed a high effect size for such a treatment on the performance of the subjects on post-tests (d = 0.93). It is worth mentioning that this effect size was not always the result of comparing the explicit instruction treatment to a zero treatment. This is because of the 32 studies, only ten had true control groups that received no treatment on the target form(s). The rest of the studies had comparison groups that received other treatments (as discussed above). In spite of that fact, the average effect size of the explicit instruction treatment was still high.

In addition to the average effect size of all the studies, individual effect sizes of individual explicit instruction studies seemed to have a high effect size since 14 studies had a high effect size (above 0.8) 12 of them showed an effect size that is above 0.10. As mentioned in the previous chapter, four studies had a negative effect size. One of the eleven studies that showed a medium effect size is Sato (2005) which tested the explicit instruction treatment against the textual enhancement treatment. This means that the comparison group in this study received textual enhancement treatment. In addition to that, one of the three studies that showed a low effect size is Heo (2007) that tested the effect of both treatments (explicit instruction and textual enhancement) against two comparison groups, one of them received explicit instruction and the other one received textual enhancement.

Besides the subjects' performance on the post-test, when comparing their performance prior to the treatment and after the treatment, it is obvious that the participants in nearly half of the studies that provided enough information of the pre-post treatment to be calculated made a progress from the pre to the post test. The performance

of the subjects in the other half of the reports increased from a negative effect size to a high effect size except for one study (Sanz & Morgan Short, 2004). This suggests that explicit instruction had a significant effect on the subjects' performance. In fact, even when looking at the pre to post progress of the subjects' performance in the studies that showed a medium (seven studies), low (two studies) or negative effect size (three studies), the subjects in these studies (except for two studies) showed some improvement from the pre to the post tests. In addition to these to tests, of the 32 study reports that examined the effect of explicit instruction, 16 provided results to be calculated for a delayed post-test that tested the effect of the treatment weeks or months after the treatment. The average effect size of the delayed post- test (second post-test) was also high (d = 0.81). Generally speaking, I can say that the findings of the effect of this treatment confirm the second hypothesis of this study that explicit rule presentation has a significant effect on the subjects' noticing/acquisition. This result actually resembles what Norris and Ortega (2000) (described in Chapter II) found in their meta-analysis about the effect of explicit instruction. The authors reported that explicit instruction seemed to have a high effect size.

The last question in this study was which of the two treatments would have a more significant effect on the noticing/acquisition of the target grammatical structures. The above-mentioned discussion of the first two questions answered this last question. Obviously, the more explicit treatment (explicit instruction) had a more significant effect than the implicit treatment (textual enhancement) on the subjects' performance. The average effect size of all the studies and the effect size of each individual study show that explicit instruction had more significant effect than textual enhancement. This actually

confirms the third and last hypothesis in this study. It should be noted, however, that the number of the studies that examined this more explicit treatment is almost the double (31 study reports) than the number of the studies that examined the effect of the textual enhancement treatment (17 study reports) excluding the one study that examined the effect of both treatments on the same group. As a matter of fact, the number of the studies in this meta-analysis (for each treatment separately) is fairly small which does not allow for generalizations (as will be discussed in the limitations section).

The comparison of each one of the moderating variables and the effect sizes of individual study reports did not show a significant effect of these variables on the performance of the subjects in their first post-tests in either treatment. This excludes the comparison between the age variable and the subjects' performance in the explicit instruction studies. It should be noted that I did not compare all the 45 study reports to the moderating variables of proficiency level, previous knowledge, number of treatments or duration of treatments. This is because not all the primary authors provided adequate information of these variables in their studies. For example, primary researchers provided information about the previous knowledge of the subjects only in 17 studies (out of 32) in the explicit instruction studies and only in 11 studies (out of 18) in the textual enhancement studies. On the other hand, almost all the studies provided or implied the proficiency level variable, but I only compared 25 explicit instruction and 13 textual enhancement studies. This is because there were not sufficient categories to be compared using the *t* test or *F* test.

In fact, even when nearly all the studies were compared, sometimes the comparison was not balanced. An example of this is the duration of the treatment(s)

variable in the textual enhancement studies that reported such a variable was always short except for two studies that reported a long duration. Another example is the age variable in the explicit instruction studies. All the subjects in these reports were adult subjects except for two reports that used high school students. The last example is the control/comparison group variable that was always reported but not balanced among the comparisons of both treatments.

5.3 Limitations

The conclusions drawn from the present meta-analysis are tentative rather than definite. This is because not all studies provided adequate information about the subjects or the treatments to be used in comparisons (as discussed above). The second reason is the publication bias since this meta-analysis did not examine unpublished studies. Cooper (2010) stated that a complete synthesis of the research literature should include published as well as unpublished research. This is because published research is sometimes biased since most journals only publish studies that show significant results (as discussed in Chapter II). The estimation is that significant findings are eight times more likely to be published than non-significant findings (Greenwald, 1975). In addition, studies that show positive findings are seven times published more than studies that support the null hypothesis (Coursol & Wagner, 1986). In fact, Cooper (2010) stated that some studies show significant results but they do not get published because they do not meet the journals' requirements. Moreover, some studies are not published because they do not confirm the previously held beliefs. This problem is called the confirmatory bias (Cooper, 2010). Because of the publication bias, it is important to include unpublished research.

Another limitation in this study is the small number of study samples. There were only 18 textual enhancement study reports and 32 explicit instruction study reports. Because of that, the results cannot be generalized. The last limitation in this study is the inability to fully test the effect of the two input enhancement treatments on the "noticing" variable separately from the acquisition variable. As mentioned in the previous chapter, only five studies provided values for the effect of the treatment on noticing. The rest of the studies combined the effect of noticing and acquisition. Because of that, the question on what the effect that textual enhancement and/or explicit instruction have on noticing was not fully answered.

5.4 Pedagogical Implications and Suggestions for Future Research

The two input enhancement treatments examined in this meta-analysis are two of the most commonly used instructional treatments in ESL/EFL classrooms. Most teachers use textual enhancement, sometimes unintentionally, by underlining the target forms or writing them in a different color whether implicitly or while explaining the target forms through rule presentation. The study showed a high effect size for the explicit instruction treatment. Therefore, using such a treatment in ESL/EFL classrooms should be safe. On the other hand, relying solely on the textual enhancement treatment might not be very effective in promoting the "noticing" and/or acquisition of the target form(s). Because of that, teachers should be careful when using such an enhancement technique.

There are some suggestions for future meta-analysis research, in particular, and empirical research, in general. For future met-analysis research, secondary researchers should consider some moderating variables. This meta-analysis only tested the effect of the moderating variables of age, proficiency level, previous knowledge, number of

treatment(s), duration of treatment(s) and control/comparison groups. The task type variable was not tested since most studies used receptive and productive measurements at the same time. However, for future meta-analysis research, synthesists could calculate separate effect size values: one for receptive measurements and one for productive measurements in each study and, then, calculate an average effect size value for each type of measurement across the different studies. In addition, for future meta-analysis, researchers might consider examining whether the number of target forms tested in each study would have an effect on the subjects' performance. This variable was not examined in this study since as mentioned in Chapter IV, the majority of the studies tested one target structure.

I also have some suggestions for empirical research. I noticed during the synthesizing, summarizing and analyzing process of the research studies that not all studies provided mean and standard deviation values for the participants' performance. Some of them provided t test or F test scores that allowed me to calculate the effect size in general without being able to calculate the pre-post difference. Other studies did not provide enough information for the effect size to be calculated at all (for example, Leeman et al., 1998; Shook, 1994) and, therefore, I excluded them from the meta-analysis. Therefore, researchers are encouraged to provide at least the mean and standard deviation values in their reports.

I also noticed that some studies were inaccurate in labeling the dependent variables. For example, some of the studies that used noticing as a dependent variable did not actually study that variable and instead focused on acquisition in general. In addition, some of the studies did not state the dependent or independent variables of the

study. These studies mentioned the variables sometimes indirectly in the research questions or hypotheses while other times only implied them in the introduction or abstract. Primary researchers should be accurate when labeling and stating both types of variables. Furthermore, as mentioned above, not all the studies reported the proficiency level, previous knowledge or specific age of the subjects and not all of them mentioned the number or duration of treatment(s). Primary researchers are encouraged to provide a complete description of the individuals and treatments in their studies. This is because without such information comparisons among the different studies are not possible.

Moreover, it is apparent that the number of the textual enhancement studies is fairly small. Only 15 studies (that met the inclusion criteria) have examined textual enhancement since 1980. In fact, it seems that these studies are conducted by the same group of researchers which suggest a small research community. Most of those researchers only studied adults using short treatments. It would be interesting to find more studies in the future that examine the effect of such a technique on different kinds of learners (for example, children) using longer treatments.

In addition to the age and length of treatment(s) variables, I think it would be useful if primary researchers took the previous knowledge variable into consideration. Among all the retrieved studies, none has considered studying the difference between the effect of the treatment on a group that has some pervious knowledge of the target form(s) and another group that has zero knowledge of the same target form(s). The last recommendation in this study concerns measuring the long-term effect of instructional treatments. As mentioned in the previous chapter, only 21 studies used second post-tests to measure the long-term effect of the instructional treatment(s). I think future studies

should take the time variable into consideration and try to test the effect of the treatment after a long period of time.

5.5 Conclusion

This meta-analysis attempted to test the effect of two input enhancement treatments (textual input enhancement and explicit rule presentation) on the noticing/acquisition of target grammatical structures. I retrieved 39 studies that examined the effect of these two variables on "noticing" and/or acquisition. These studies were published between the years of 1980 and 2010. I compared them in terms of publication characteristics, learner characteristics, study design and research analysis. In addition, to examine the effect of the independent variables, I calculated the average effect size of 32 explicit instruction study reports and the average effect size of 18 textual enhancement study reports. The results showed that explicit instruction had a high effect size (d =0.93). This suggests the effectiveness of using such a treatment in ESL/EFL classrooms. On the other hand, textual input enhancement had a low effect size on the subjects' performance on the post-tests (d = 0.30). This means that teachers should not rely solely on this implicit treatment and try to combine it with other instructional treatments that are more explicit. The study also offered some pedagogical implications and suggestions for future researchers.

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Appendix A

Publication Sources

Source	Number of Frequency
Applied language Learning Journal	4
Applied Psycholinguistics Journal	1
French Review Journal	1
Hispania Journal	1
Institute for Research in Language Teaching Bulletin Journal	1
Language Learning Journal	3
Language Teaching Research Journal	1
Modern Language Journal	3
TESOL Quarterly Journal	2
Spanish Applied Linguistics	1
Studies in Second Language Acquisition Journal	5
Book Chapter	3
Thesis	1
Dissertation	12
Total	39

Appendix B

Summary of Several Features in the Study Reports

Study	Age	Level	Knowledge	Group	Number	Duration
A 1 1						
Akakura	•			. 1	2	
(2009)	А	L, M & H	yes	control	3	n.t
Avoun						
(2001)	А	L & M	No	comparison	4	n t
Bitchener	11		110	comparison		11.0
& Knoch						
(2008)	А	М	n.t	comparison	2	n.t
Brender				••••••••••••••	-	
(2002)	А	n.t	n.t	comparison	3	n.t
De-Santis				1		
(2008)	А	L	n.t	comparison	1	SH
Doughty				1		
(1991)	А	n.t	yes	comparison	10	n.t
Ellis et al.			2	1		
(2006)	А	Μ	yes	comparison	2	SH
Erlam						
(2003)	H/S	n.t	yes	control	3	SH
Fotos &						
Ellis (1991)	А	Μ	n.t	control	1	SH
Grim						
(2005)1	А	Μ	No	comparison	1	SH
Grim						
(2005)2	А	Μ	No	comparison	1	SH
На					_	
(2005)	А	Μ	n.t	control	8	G
Haight		_				
(2008)	А	L	n.t	comparison	60	n.t
Hayer		-				
(1997)	А	L	yes	comparison	6	SH
Heo	•	N			0	CT1
(2007) T====:	А	M	n.t	comparison	2	2H
1ZUM1	٨			o o méric 1	6	М
(2002)	А	n.t	yes	control	6	Μ

Study	Age	Level	Knowledge	Group	Number	Duration
Jourdenais						
(1998)	А	M & H	n.t	control	3	SH
Kubota						
(2000)1	А	L	n.t	control	2	SH
Kubota						
(2000)2	А	L	n.t	control	2	SH
Li						
(2009)	А	L & H	n.t	comparison	1	SH
Lee						
(2007)	H/S	n.t	no	comparison	3	SH
Leow				-		
(2001)	А	L	no	comparison	1	SH
Leow et al.						
(2003)1	А	L	no	comparison	1	n.t
Leow et al.				•		
(2003)2	А	L	no	comparison	1	n.t
Master				•		
(1994)	А	Μ	yes	comparison	27	n.t
Melendez			2	1		
(1993)	А	L	n.t	control	1	SH
Overstreet						
(1998)	А	М	yes	comparison	1	SH
Robinson			-	-		
(1997)	А	Μ	no	comparison	2	n.t
Rosa &				•		
Leow						
(2004)	А	Н	no	comparison	1	SH
Rosa &				-		
O'Neil						
(1999)	А	Μ	no	comparison	1	n.t
Sanz &				•		
Morgan						
(2004)	А	L & M	no	comparison	1	n.t
Sato				1		
(2005)	А	Н	no	comparison	15	n.t
Scott				T		
(1989)1	А	Н	no	comparison	2	n.t
Scott			-	r		
(1989)2	А	Н	ves	comparison	2	n.t
(1)0))=			J C S	2011purison	-	

Scott (1990)1 A H yes comparison 2 n.t	
(1990)1 A H yes comparison 2 n.t	
• •	
Scott	
(1990)2 A H yes comparison 2 n.t	
Sheen	
(2007) A M n.t control 2 n.t	
Sheen	
(2010) A M n.t control 2 SH	
Tanaka	
(1996) H/S n.t n.t comparison 2 SH	
Williams &	
Evans	
(1998)1 A M n.t comparison n.t n.t	
Williams &	
Evans	
(1998) ² A M n.t comparison n.t n.t	
White	
(1998) C n.t n.t comparison 6 G	
Wong	
(2005) A L no comparison 3 SH	
WU (2007) A M nt control 5 M	

 $\frac{(2007)}{Note. A = adults, H/S = high school and C = children, L = low, M = medium and H = high, SH = short, M = medium and G = long, n.t. = not mentioned$