DOCTOR OF PHILOSOPHY

# An investigation into the effects of processing instruction on the acquisition of English relative clauses by Syrian learners

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# An Investigation into the Effects of Processing Instruction on the Acquisition of English Relative Clauses by Syrian Learners

**by**

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**Abstract**

The purpose of this research was to investigate the effects of Processing Instruction (VanPatten, 1996, 2007), as an input-based model for teaching second language grammar, on Syrian learners' processing abilities. The present research investigated the effects of Processing Instruction on the acquisition of English relative clauses by Syrian learners in the form of a quasi-experimental design. Three separate groups were involved in the research (Processing Instruction, Traditional Instruction and a Control Group). For assessment, a pre-test, a direct post-test and a delayed post-test were used as main tools for eliciting data. A questionnaire was also distributed to participants in the Processing Instruction group to give them the opportunity to give feedback in relation to the treatment they received in comparison with the Traditional Instruction they are used to.

Four hypotheses were formulated on the possible effectivity of Processing Instruction on Syrian learners' linguistic system. It was hypothesised that Processing Instruction would improve learners' processing abilities leading to an improvement in learners' linguistic system. This was expected to lead to a better performance when it comes to the comprehension and production of English relative clauses.

The main source of data was analysed statistically using the ANOVA test. Cohen's d calculations were also used to support the ANOVA test. Cohen's d showed the magnitude of effects of the three treatments. Results of the analysis showed that both Processing Instruction and Traditional Instruction groups had improved after treatment. However, the Processing Instruction Group significantly outperformed the other two groups in the comprehension of relative clauses. The analysis concluded that Processing Instruction is a useful tool for instructing relative clauses to Syrian learners. This was enhanced by participants' responses to the questionnaire as they were in favour of Processing Instruction, rather than Traditional Instruction.

This research has theoretical and pedagogical implications. Theoretically, the study showed support for the Input hypothesis. That is, it was shown that Processing Instruction had a positive effect on input processing as it affected learners' linguistic system. This was reflected in learners' performance where learners were able to produce a structure which they had not been asked to produce. Pedagogically, the present research showed that Processing Instruction is a useful tool for teaching English grammar in the context where the experiment was carried out, as it had a large effect on learners' performance.

Key words: Second Language Acquisition, Input, Output, Input Processing, Processing Instruction

To my Father and Mother

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# Chapter One: The Current Research and its Setting

## 1.1The Present Research

### 1.1.1 The objectives and the scope of the research

Research into second language acquisition has witnessed a shift in focus from investigating "whether or not instruction affects the route, rate, accuracy, and ultimate success of language acquisition" to examining the effectiveness of different instruction treatments (Cadierno 1995: 180). For instance, the issue of whether formal instruction would have any effects on acquisition has been extensively under investigation by many scholars (e.g. Ellis, 1984; Pienemann, 1984; Krashen, Sferlazza, Feldman, and Fathman, 1976). This focus has changed to comparing the effects of different instruction treatments on learners' developing system. VanPatten (1996) is one of the pioneers who has stressed the importance of testing the effects of different instruction treatments on learners' linguistic developing system.

In this respect, VanPatten (1996) put forward a focus on form model to teach second language grammar through processing input or what he referred to as Processing Instruction, which he claimed to outperform traditional output-based instruction. Processing Instruction is motivated by the Input Processing Hypothesis according to which learners have to accommodate new presented information into their linguistic system to be able to access and use. Input Processing involves different sub-processes which will be discussed in detail in chapter three. Focus in this introductory section is on introducing Processing Instruction.

Processing Instruction "*seeks to alter the way in which learners perceive and process linguistic data in the input* in order to provide the internal learning mechanisms with richer grammatical intake", as defined by VanPatten and Sanz, (1995: 169, emphasis preserved from the original script). Thus, the main aim of Processing Instruction is to alter learners' processing procedures to help them in internalising the target grammar form to be part of the linguistic system. As a model motivated by the 'psychological strategies' and mechanisms (Lee and VanPatten, 2003: 137), Processing Instruction focuses on those strategies which are usually used by second language learners in order to develop their interlanguage system. These strategies (default strategies) can be defined as the universal

processing strategies usually followed by learners when processing a new grammar form in the target language (see section 3.4 for more details). Unfortunately, default strategies can sometimes have an opposite effect by impeding the processing process. Thus, this model is designed to first capture these problematic processing strategies that can impede the processing process, and next to push learners away from using those strategies using input-based activities, as will be highlighted in section (3.4). In other words, Processing Instruction intervenes to alter learners' inappropriate processing strategies (default). These inappropriate/ default processing strategies are the ones which can affect learners' processing of the target construction. The purpose of Processing Instruction (see section 3.4) is to alter learners' default processing strategies during input processing. This will lead, according to VanPatten (1996, 2007), to an improvement in learners' processing abilities of the target construction. Although other types of instructing grammar can lead to improvement in learners' performance (e.g. Traditional Instruction), Processing Instruction is claimed to facilitate learning by helping learners to assimilate grammar.

Unfortunately, most second language types of instruction focus on the role of output-based practice in classroom learning. That is, by reviewing learning theories, it can be said that it is agreed that the first step in processing second language grammar is processing input, as will be made clear in the following two chapters. If this process is established then using the form would be the expected result. So, Traditional Instruction does not work within this general agreement as focus is on the last process (i.e. output) (see figure 3.1). This could be a result of the assumption that output-based practice may help learners in developing competence in the target language (e.g. Swain, 1985). Traditional Instruction is mainly about explicit instruction followed by mechanical drills which helps in automatising the use of the target item.

In contrast to the main stream of instruction, VanPatten and Cadierno (1993) and VanPatten (1996) argued that second language instruction should take input rather than output as the starting point. To that end, VanPatten proposed Processing Instruction as a model for teaching second language grammar (1993, 1996). Processing Instruction includes two types of activities (Structured Input Activities) which are designed to help learners in processing input by keeping learners' processing strategies in mind in the design stage of each activity. Processing Instruction does not contradict current approaches

to language teaching, as the employed activities are in line with the learner-centered communicative approach to language teaching as it will be detailed in section (3.4.2).

Importantly, as a fairly recent model, Processing Instruction has received a lot of attention and many researchers have tested the effects of Processing Instruction on second language learners' linguistic developing system (see section 3.4.3 for an overview of previous research on Processing Instruction). However, the results from these studies have been controversial. Therefore, Benati and Lee (2007) have encouraged further research to be undertaken to understand "the interaction between the way learners process input and the instruction to which they are exposed" (2007: 5). The main focus of the present research is to investigate the effectiveness of Processing Instruction on processing English relative clauses by L2 learners.

For the purpose of this research, a quasi-experimental setting was designed to test the effects of Processing Instruction, in comparison with Traditional Instruction. It should be mentioned that most of the studies which tested the effects of Processing Instruction on second language learners have focused on the acquisition of specific grammatical features of the Romance languages (e.g. French, Italian, and Spanish). Besides, these studies focused on two of the principles suggested by VanPatten (1996, 2007): namely, the first noun principle and the lexical preference principle. Furthermore, these studies did not stress the role that the first language can play in processing and restructuring second language grammar. Moreover, these studies focused only on how to help learners to make correct Form-Meaning Connections (e.g. VanPatten & Cadierno, 1993; VanPatten & Oikennon, 1996; VanPatten & Sanz, 1995; Cadierno, 1995; VanPatten & Wong, 2004). That is, none of these studies examined the effects of Processing Instruction on second language learners' processing of complex structures such as English Relative Clauses in which more than one principle is involved (e.g. the sentence location principle and the primacy of meaning principle).

So, it seems it is worth investigating this model on the acquisition of different grammatical forms and structures to reach a general understanding of its effects on learners' linguistic system. Therefore, the current research was conducted to broaden the discussion related to Processing Instruction by investigating the effects of Processing Instruction on L2 learners' comprehension and production of English Relative Clauses.

### 1.1.2 Motivation for the current research

Motivation behind the current research can be summarised by the following points:

- The novelty of this type of instruction (the debate started in 1993 in a study conducted by VanPatten and Cadierno)
- The optimal results which VanPatten and his team claim to be achieved from implementing this type of instruction, which can be a highly feasible alternative to traditional output-based models for instructing the grammar of a second language.
- The highly stimulating and encouraging debate, and discussion which points out discrepancy in the studies which tested Processing Instruction (e.g. DeKeyser and Solkaski, 1996; Salaberry, 1997; Collentine, 1998; Allen, 2000).

- The fact that most of these studies so far have focused on the acquisition of Spanish, Italian and French (Van Patten and Cadierno, 1993; Cadierno, 1995; Van Patten and Wong, 2004; Benati, 2001). So, to verify the utility and generalisation capabilities of this model, it is worth applying it to a group of learners whose second language is English.
- Limitations of previous Processing Instruction studies. The current research attempts to address some of the limitations of the aforementioned studies, as summarised by the following arguments:
  (1) Most of previous studies, if not all, used the Repeated Measures ANOVA for analysis, with no justification for the use of parametric tests (see section 5.2). Besides, no further tests or calculations were used to strengthen the analysis and make the outcomes more reliable. In the current research, the ANOVA test was used as a main tool for the analysis. This is followed by Effect Size calculations to evaluate the effect of instruction within and between groups.
  (2) The inclusion of a delayed post-test. This is especially useful in examining the retained effects over time. However, several studies on Processing Instruction did not use a delayed post-test to test the retained effects over time (e.g. Collentine, 1998; VanPatten and Oikkenon, 1996; VanPatten and Sanz, 1995; VanPatten and Wong, 2004).
  (3) Structured Input Activities in previous studies focused on Form-Meaning Connection as an independent entity. In other words, processing input is not only about making Form-Meaning Connection, as it is also equally important to understand the interaction between the processed items within the sentence.

(4) Previous research provided no criteria for the validity and reliability of the research design they implemented.

Thus, the present study was conducted to contribute to research related to the role of Input in second language acquisition in general and the effectiveness of Processing Instruction on L2 learners processing of English relative clauses in particular.

### 1.1.3 Research questions and hypotheses

As stated above, the present research investigates the effects of Processing Instruction and Traditional Instruction on L2 learners' development of comprehension and production of English relative clauses. Research questions are summarised in the following:

1. Would L2 learners receiving Processing Instruction improve after instruction when it comes to the comprehension of English relative clauses?
2. Would L2 learners receiving Processing Instruction improve after instruction when it comes to the production of English relative clauses?
3. Does Processing Instruction have an effect on the way L2 learners' process input?
4. If the response to previous question is positive, would the possible positive effects of instruction be retained over time?

*Research hypotheses*

**1.** Instruction which is directed at how learners process input can help learners in the comprehension of English Relative Clauses.

**2.** Instruction which is directed at how learners process input can help learners in the production of English Relative Clauses.

**3.** Focusing on changing learners' problematic strategies in processing English relative clauses can facilitate processing input to enrich intake.

**4.** As the improvement is assumed to be a result of real changes to learners' linguistic system, the possible positive effects are expected to be retained over time.

## 1.2 The Context of the Research

The current research was conducted in a Syrian context where Arabic is learners' first language. The choice of Arabic speaking context is not random; rather it has been chosen due to the problems usually faced by Arabic speakers when learning English relative clauses (see section 4.5.2.4 for more details about these difficulties).

### 1.2.1 Education system in Syria

The current research is conducted in a Syrian context. In particular, the research is carried out in a secondary school in Damascus (the capital of Syria). 98% of schools in Syria are state-run schools. In 2007, 8 million students were present in the education system of Syria (4 million in primary education, 1.4 million in secondary education and 2.3 million in higher education (Ménacère, 2009)); the population that year was, according to the Population National Bureau, about 19,314,750.

The education system in Syria consists of the following stages: primary education (6 to 12 years old), preparatory education or the lower secondary education (12 to14 years old), and secondary education (15 to 17 years old). Of course, all subjects are taught using Arabic language, except for the English language subject which is normally taught two to three hours a week. Students start studying foreign languages (French and English) from the first grade (age 6).

Students start with primary school at age six for six years (from grade 1 to 6). This is followed by three years of preparatory education (grade 7 to 9). Education during primary and preparatory grades is free and compulsory. After primary and preparatory education, students go to secondary school where education is free but not compulsory (grade 10 to 12, or what is known as the baccalaureate).

The ninth grade is decisive for students. Depending on their final exam at the ninth grade, students are either admitted to secondary schools or to vocational secondary schools (business, industry, agriculture, or arts). Getting into secondary schools or vocational schools depends on the total scores students get in their final exam where entry requirement to secondary school is decided by the Ministry of Education each year. Students who are directed to secondary school choose to study either literary secondary education or scientific secondary education.

Another decisive exam is the nationally set baccalaureate exam which all students submit at the same time (usually in June each year). University entry depends mainly on the total result that students get in the baccalaureate exam. So, each department at the state-run universities has entry requirements which are usually decided by the Ministry of Higher Education and differ from one year to another depending on the number of applications each department receives.

There are five main state-run universities in Syria: The University of Damascus (founded in 1923), the University of Aleppo (1960), Tisheen University (1971) in Latakia, Furat University in Deir Al Zour (2006), and Al-Baath University (1979) in Homs. Again, studying at the university level is free for all students but not compulsory.

If a student does not get the required score for university entrance, s/he would lose the opportunity for education as there were no private universities before 2003. However, a decree which was issued in 2001 allowed private universities to be established in Syria. This was an alternative for students whose scores do not qualify them to join a state-run university. Curriculum at private universities is taught in Arabic and foreign languages. The University of Alkalamoon was the first private university to open in Syria in 2003. So far, 14 other universities have been issued with licenses to open in Syria. Thus, students whose scores are low can now continue higher education at well-qualified universities. The main difference between state-run universities and private universities lies in the number of students, as the number at private universities is far less than that of state-run universities.

In addition to the above universities, the Virtual Learning University was opened in 2002 (the total number of students in 2010 was 9000 students). The Virtual Learning University which came as a response to the global development in e-learning offers opportunities to students to continue higher education. The Virtual Learning University is linked to the Ministry of Higher Education. However, the Virtual Education University has a limited number of specialisations offered to students; namely, Information and Management Systems Engineering, E-Marketing, Information Technology, Economics, Law and Internet Technology. What distinguishes this university from the state-run universities is the partnerships with International Universities and Institutions (e.g. Baker University, the University of Ohio and Bellevue University, Edexcel). Unlike state-run universities, teaching at the Virtual Learning University is based on delivering electronic materials over the internet

to students supported by live sessions which enable a direct interaction between the student and the teacher. These live sessions are also recorded so that students can get back to them anytime.

### 1.2.2 English taught in Syria

Teaching English is part of the national syllabus which starts at age six (1st grade). In the last few years, the step has been taken to include teaching French language in primary education as an acknowledgement of the importance of teaching foreign languages from an early age. Thus, Syrian students in primary, elementary, and secondary schools are exposed to two foreign languages (English and French).

English textbooks were thoroughly updated in the early 2000s by the Ministry of Education. This revision was the result of the growing acknowledgement that the previous used text books were outdated, especially as they focused exclusively on learning vocabulary and English grammar. As for the new text books, focus is shifted to promoting interaction and teaching English grammar through communication where the aim is to equip learners with a communicative competence. The context used in textbooks in primary school is chosen to be related to the Arab culture; this focus decreases in preparatory and secondary textbooks where orientation changes to the English-speakers' culture. Still, when it comes to actual practice in the classroom, English is still taught traditionally (explicit explanation of the grammar rule followed by output-based practice). This could be because graduates from the English department do not receive relevant training courses during their university study. This, in turn, might be attributed to the huge number of students in the English department at Damascus University which is about 9000 students.

This situation is gradually changing as students who are interested in teaching study a one year diploma in which they receive a non-compulsory training course in teaching English as a second language. Graduates who receive this course become more qualified to teach than those who do not. Those who do not receive such training may find no way but to teach the way that they were taught English regardless of the aims of textbooks. This issue became under focus, as it has been proved that teachers' beliefs about teaching may affect the way they teach (see, for example, Brog, 1999; Brickhouse, 1990).

In the English department at Damascus University, students study the following courses

during the four years:

Table 1.1 English courses during the four years of study in the English Department at Damascus University

| **Subject** | **Year** | **Subject** | **Year** |
|---|---|---|---|
| Linguistics | 1st year, 2nd year , 3rd year, & 4th year | World Literature | 4th Year |
| An introduction to prose | 1st year | Shakespearean drama | 2nd year |
| An introduction to poetry | 1st year | Drama in the Restoration period | 2nd year & 3rd year |
| An introduction to drama | 1st year | Poetry till the Victorian Age | 3rd year |
| An introduction to research methods | 1st year | History of English literature | 3rd year |
| Short Story | 1st year | Prose fiction in the 19th century | 3rd year |
| National Education | 1st year | Intonation | 3rd year |
| Arabic language | 1st year | Literary criticism | 3rd year & 4th year |
| Composition | 1st, 2nd, 3rd | American literature | 3rd year & 4th year. |
| Translation | 1st year, 2nd year, & 3rd year | Comparative literature | 4th year |
| A second European language | 1st , 2nd , & 3rd | Prose fiction in the modern age | 4th year |
| Poetry in the restoration period | 2nd year | Poetry in the modern age | 4th year |
| Prose fiction till 1800 | 2nd year | Drama in the modern age | 4th year |
| phonetics | 2nd year | | |

All the above mentioned courses are taught in English excluding Arabic language and National Education which are taught using the Arabic language (two hours per week for all students of the English department).

It is clear from the above list that focus is predominantly on English and American literature which includes analysis, evaluation, and criticism. Thus, it becomes increasingly important for graduates to take the teacher training diploma course before undertaking any teaching job.

### 1.2.3 Students' motivation for learning English

In general, Syrian learners are motivated to learn English as English has become an international language. This could be as a result of the fact that English is associated with technological developments, which makes English the language most used on the internet and the media. This renders English language important for both education and employment as well as entertainment.

In addition to the above general motivation to learn English, it could also be said that Syrian students have an instrumental motivation to learn English, as it is a requirement for getting a good job in Syria (e.g. teachers in private and government schools, translators, press correspondents, working in banks where having a good command in the use of English is a requirement and so on). In brief, Syrian learners are highly instrumentally motivated to learn English as the need for knowing foreign languages in general, and the English language in particular, becomes a necessity for getting a good job in Syria.

The role of motivation in language learning has received much attention as it can affect the learners' ability to learn the target language. For a review of how motivation can affect learning, see section (2.8).

## 1.3 An Overview of the Research

For the purpose of the current research, a quasi-experimental research was carried out to investigate the effects of Processing Instruction on Syrian learners' performance before and after instruction. Participants (66 students in total) were allocated to three groups: Processing Instruction group, Traditional Instruction group, and a Control Group. The choice of Traditional Instruction as another experimental group was not random as it is the one mainly used in Syrian classrooms, as mentioned above. So, it is of interest to investigate the effects of Processing Instruction when compared to instruction used in Syria. It is also of interest to show participants' reaction to Processing Instruction, as this area has been overlooked in previous research on Processing Instruction. That is, previous

research focused predominantly on the effects of Processing Instruction, with no reference to participants' attitudes towards Processing Instruction. Thus, viewing teaching models from only the researcher's views is unfair, as how recipients react to this model is more important, as they are the ones for whom the model is developed. So, learners' attitudes towards a specific teaching method should be under focus (see for example Kumaravedivelu, 2001). It is for this reason that the researcher focused not only on the effects of the different treatments, but also on how learners want to learn English. Teaching methods dilemma will be discussed in more details in section (2.7).

To investigate the effects of instruction in the three groups, results of the direct post-test and the delayed post-test were compared to the results of the pre-test (see section 5.4.4). Besides, to judge the effect size of instruction in the experimental groups, results were compared to the performance of participants in the control group (see section 5.4.4/ 5.4.5). The tests were designed to elicit answers which can reflect participants' comprehension and production of English relative clauses (see section 4.6.1).

### 1.3.1 Organisation of the chapters

This thesis is divided into seven chapters. After this introductory chapter, the rest of the chapters will proceed as follows:

Chapter 2 and chapter 3 present a review of the theoretical framework of relevance to this research. Chapter 2 focuses on second language acquisition theories in general with particular attention paid to the factors which can affect language learning. The chapter starts with discussing the reasons responsible for having different views in relation to second language acquisition. This is followed by a review of the influential theories in the field: Behaviourism, Universal Grammar, and Krashen's theory of second language acquisition. Next, different perspectives on second language acquisition are presented focusing on the cognitive and sociolinguistic perspectives. The chapter concludes with identification of the general factors which can affect language learning.

Chapter 3 presents the theoretical framework of Processing Instruction with focus on the Structured Input Activities present within the Processing Instruction model. The chapter starts with an explanation of information processing strategies in language learning with focus on Form-Meaning Connections. This is followed by a review of the role of attention

in language learning in general and in Form-Meaning Connections in particular. Following this, the role of input and output is explained with reference to the Input Hypothesis and the Output Hypothesis. Finally, the chapter reviews the Processing Instruction model presented by VanPatten (1996, 2007) with a focus on Structured Input Activities.

Chapter 4 presents the study design and the data collection methods. The chapter starts with a review of the effects of intellectual foundations on research methodology. Next, related work in experimental design in education research is discussed. Subsequently, validity and reliability in experimental designs are investigated. Then, a full argumentation related to ethical issues present in education research in general and the ones in the current research in particular are presented, justifying some decisions taken in the current research. This is followed by the design of the current research, with a focus on participants, the target form, instructional packets, data collection methods, and assessment tasks. Finally, a summary of the piloting and the actual experiment is provided.

Chapter 5 is the data analysis chapter. The chapter starts with a review of the statistics used in education research and the present study. This is followed by a discussion of the assumptions underlying parametric tests, focusing on the options available to researchers in case the assumptions are not met. Data analysis outcomes are provided next. This includes the descriptive statistics, the results from the ANOVA test, and the Effect Size calculations using Cohen's d. Students' perception and attitudes to Processing Instruction is then presented. The chapter ends by a summary of ethnographic data in the form of field notes.

Chapter 6 presents a discussion of the results. In this chapter, all the data collected in this research is connected so as to get a comprehensible image of the results of the tests, students' feedback, and also the ethnographic data.

Chapter 7 summarises the research with reference to the research questions posed in chapter one. The chapter then presents the research contribution and limitations concluding through final remarks related to Processing Instruction.

### 1.4 Summary

This chapter has outlined the aims and the scope of the current research. The context of this research is also highlighted. It is important to present the above details of the context in which the research is carried out, as some of the peculiarities could have an effect on the

research and on participants' performance such as participants' motivation and level of proficiency in English. Students' attitudes towards second language learning can have a crucial role in language learning (e.g. Dörnyei, 2005 McGroarty 1996; Grdner 2001); this will be further discussed in section 2.8.

Peculiarities of the context of this research induced some constraints on the scope of the research. These constraints can be summarised into the following points: Firstly, depending on the available facilities, the focus in classroom activities was on written activities. Due to participants' level of proficiency, the focus was also on written performance rather than spoken performance. Consequently, this has restricted the choices available to the research, as the researcher decided to test the effects of Processing Instruction on Syrian students' comprehension and production of English relative clauses, focusing on their performance in written tasks rather than speech. A positive point is participants' motivation as most of the participants, if not all, were well motivated to take part in the research and to get the benefit of the lessons on relative clauses (this will be further discussed in chapter 6).

## Chapter Two: Second Language Acquisition: Theory and Pedagogy

### 2.1 Introduction

As the role of input is omnipresent in all theories of SLA, and as Processing Instruction is based on this influential role of input, it is essential to give a brief review of the influential theories in this field so that any later reference (in the next chapters) will be made clear. Although not all the theories that will be detailed are theories of Input Processing, it seems appropriate to sketch out these theories as Processing Instruction was not created in vacuum, and reference to previous theories of SLA cannot be avoided in the subsequent chapters of this thesis.

The first section in this chapter addresses why there are different theories in the field of SLA. This will be followed by an overview of these theories together with the relevant pedagogical implications. Different perspectives on SLA will be presented afterwards, ending the section by questioning the teaching methods dilemma in the field. The last section in the chapter refers to factors beyond language itself which may affect language acquisition.

### 2.2 Why Different Theories of Second Language Acquisition?

Learning a language other than one's native language is a point of interest to theorists in the field of SLA. At the same time, it is one of the problematic issues on which little agreement could be found between theorists in the field of SLA. This could be a result of the fact that these theorists base their understanding and perspectives of SLA on different foundations. However, these different views were not necessarily presented to compete as each theory dealt with language learning from a different angle. A parable quoted by VanPatten and Williams of four sightless men and an elephant can summarise the reason for having such different views on SLA:

> … one, holding its tail, says, "Ah! The elephant is very much like a rope." The second one has wrapped his arms around a giant leg and says, "Ah! The elephant is like a tree." The third has been feeling along side the elephant's massive body and says, "Ah! The elephant is very much like a wall." The fourth, having seized the trunk, cries out, "Ah! The elephant is very much like a snake." For us, SLA is a big elephant that researchers

> can easily look at from different perspectives. (VanPatten & Williams, 2007: vii)

What could be elicited from the above parable is that SLA is a very vast and complex field and reaching one single complete and ideal theory is not an easy goal to achieve. Still, in the field, we have many influential theories which had left a major impact on SLA research. Below is an overview of these theories with focus on how input and mind were dealt with. Of course, there is no chronological order for theories of SLA, still Behaviourism is always seen as one of the earliest.

## 2.3 Behaviourism and Language Acquisition

### 2.3.1 Habit developed by imitation

Behaviourism was based on the general findings of psychologists for learning such as Watson (1925). This was especially dominant between the 1950s and 1970s, the time where Chomsky presented his nativist theory. Behaviourism could be connected to Bloomfield's work (1933), where language was rather viewed as the development of a habit that the child learns by imitation, and reinforcement. The role of the environment is crucial in behaviourism. Lightbown and Spada summarised the importance of the environment in this theory as follows:

> The quality and quantity of the language the child hears, as well as the consistency of the reinforcement offered by others in the environment, would shape the child's language behaviour (2006:10).

In other words, the environment is the source which provides learners with the needed input to imitate and repeat. Accordingly, it is the environment, rather than the any internal factor that derives acquisition. Of course, this can be a limitation of Behaviourism as this theory does not include any reference to the role of mind or input processing while learning. After all, all these external stimuli are received by the brain for further processes before being used in spoken language. Thus, mind processes are overlooked in this theory where focus is on external stimuli according to which the input would either be reinforced by repetition or vanish by punishment. Again, this is a very simple explanation to a very complex phenomenon. This simplification of the issue together with the focus on external

factors made Behaviourism and its pedagogical implications under criticism as will be made clear below.

Behaviourism was connected to the Contrastive Analysis Hypothesis, where a person learning a second language will start with the habits formed in the first language and these habits will interfere in forming the new habits of the second language (for more details on Error Analysis and the Contrastive Analysis Hypothesis, see Corder, 1967). The debate went as follows, in Lado's words. "those elements that are similar to his native language will be simple for him, and those elements that are different will be difficult" (1957: 2). That is, when the first language and the second language are similar, the learner will acquire the second language with less difficulty than if the two languages are different.

### 2.3.2 Pedagogical Implications and Criticism

When it comes to the effects of Behaviourism on pedagogy, audiolingualism was based on this theory and dominant in the US during 1950s and 1960s. Audiolingualism was mainly concerned with imitation, repetition, and memorisation.

Behaviourism and its pedagogical implications in SLA have been severely criticised. To a degree, the following reasons could be spotted for the criticism of Behaviourism. Firstly, based on the Contrastive Analysis Hypothesis, many studies were inconsistent with respect to the predictions of this hypothesis. Some studies found that similarities between languages may cause more difficulty and confusion for learners (see, for example, Schachter, 1974; Kellerman, 1979). It was also reported that there is a consistency in the errors made by learners of a second language whose first languages are different (see, for example, Dulay et al., 1982).

Secondly, the rise of Chomsky's theory of innate knowledge (1957) also provided an argument against behaviourism. Indeed, evidence on the creativity of language refuted the claim that language is acquired through imitation as children can produce and understand sentences they never imitated or repeated before. Another refutation of Behaviourism is children's insistence on the grammar they use which makes them unable to correct their utterances directly the way uttered by adults (e.g. Pinker, 1994; Radford, 1997).

## 2.4 Universal Grammar and Language Acquisition

### 2.4.1 Innate language faculty

While Behaviourism focused on external factors (e.g. environment) affecting language learning, Chomskyan views focus on the internal faculty humans have for language learning. Indeed, in contrast to the above account of language acquisition related to imitation and repletion, the Chomskyan innate language faculty (1957, 1968, 1980, 1981) presents a completely different account of language acquisition. The innate faculty was viewed with reference to the human mind to be genetically prewired with a language faculty which enables humans to learn languages. This language faculty consists of a set of Principles and Parameters available to children acquiring their first language as presented by Chomsky 1981. These Principles and Parameters work as follows: children acquire their first languages through a set of Principles and Parameters. Principles are universal and applicable in all languages. As for Parameters, their setting depends on the input the child receives. Thus, children acquire their first language by support of their innate knowledge (Principles). As for the specific properties of this language, they are acquired through the Parameters depending on the input children receive (see, for example, Pollock, 1989).

Many scholars have supported Universal Grammar. For example, according to Radford, "the initial grammar formulated by young children show clear evidence of the acquisition of a well-developed set of symmetrical lexical category system, in that young children... seem to know how to project head nouns, verbs, prepositions and adjectives into corresponding single-bar and [XP] categories" (1990: 81). That is to say, based on the examples available to them in their first language, children build language structure by applying the principles and parameters mentioned above. According to this view, input plays a crucial role in Universal Grammar as it is through the input available, children can decide on the available structures in their language.

Another support for Universal Grammar was presented by Lightbown and Spada (2006) who demonstrated that the different stages children go through in acquiring negation are systematic among children regardless of their previous learning experience (for more details on systemacity, see, for example, Brown, 1973). This finding clearly contradicts behaviourism which restricts learning to repetition and imitation.

### 2.4.2 Universal Grammar and Second Language Acquisition

What has been mentioned above about Universal Grammar is restricted to first language acquisition. Regarding the role of Universal Grammar in SLA, many controversial views are presented. Debate started in the 1980s. Depending on the research carried out since then, the following positions can be presented to account for the role of Universal Grammar in second SLA: direct access to Universal Grammar (Full Transfer, and The Minimal Trees Hypothesis), indirect access to Universal Grammar, and no-access to Universal Grammar.

#### 2.4.2.1 The direct access model

##### 2.4.2.1.1 Full Access Model

According to the first position, second language learners have a direct access to Universal Grammar. Flyne (1996) argues that Universal Grammar is available to second language learners the way it is available to first language learners. Flyne (ibid) stressed the fact that second language learners develop grammar of the target language under the constrains of Universal Grammar (for more support for this model, see, for example, Flynn, 1987; White, 1989, 1992, 1996; Schwartz, 1998; Schwartz and Sprouse, 2000; Whong-Barr, 2005).

So, according to this model, second language learners have a full direct access to Universal Grammar (Schwartz and Sprouse, 1996). This account of the role of Universal Grammar in SLA contradicts the Critical Period Hypothesis which was proposed by Lenneberg (1967). According to this hypothesis, acquisition is more successful when children's age is less than 13. Lenneberg (1967) based the hypothesis on the fact that by puberty the hemispheric lateralisation will be complete (for more about the Critical Period Hypothesis see, for example, Lenneberg, 1967; Long, 1990). Accordingly, if learners of a second language have full access to Universal Grammar with no age restrictions, why cannot they have native-like competence in the target language? No full answer has been presented so far.

##### 2.4.2.1.2 The Minimal Trees Hypothesis

The Minimal Trees Hypothesis is one of the influential hypotheses which is considered a corner stone in the acquisition of second language syntax. The Minimal Trees Hypothesis was presented by Vainikka and Young-Scholten (1994, 1996a, 1996b). Vainikka and Young-Scholten developed the Minimal Tree hypothesis which accounts for the

acquisition of second language syntax. According to the authors, second language learners initially transfer lexical categories from their first languages. As for the development of functional categories, they are triggered by the input which learners receive. Accordingly, functional categories are not transferred from learners' first language. Rather, they emerge during the development of second language syntax a point which has been contradicted by Eubank to whom lexical and functional categories are available from learners' first language (for details, see Eubank, 1993, 1996).

First language transfer or the first language as an available resource to learners is problematic. Indeed, little agreement can be found as there are many conflicting views: those who claim a strong role for the first language in acquiring the second language, and those who claim no role for the first language in the acquisition of the second language, as well as those who take a middle-like position. First language is an available resource which learners would resort to once a gap is present in their interlanguage system. However, it is not the only available resource as other resources can also be used to compensate the deficit in the learners' linguistic system (e.g. Universal Grammar, context, plausibility, predictions of the second language and, so on).

#### 2.4.2.2 The indirect access model

According to this model, learners have access to Universal Grammar, but at the same time there is a role for first language transfer where access to Universal Grammar would be through the first language, at least at the beginning. According to this model, learners would use the Principles and Parameters they have in their first languages as a basis for the acquisition of the second language. So, learners go through a process of resetting the parameters of the first language, which are different from the second language (Cook & Newson, 1996). This stand could be connected to the Contrastive Analysis Hypothesis mentioned above, although some contradiction may occur. According to the research tested the Contrastive Analysis Hypothesis, acquisition does not always support this hypothesis as it is not always the case that languages which are similar are easier to acquire, as mentioned above. Thus, if learners start with the Principles and Parameters available from the first language, this entails that acquisition would be easier if the second language is similar to the rules of the first language. This has been refuted in research as mentioned above.

A clearer account was presented in VanPatten's model, as the author assumed that learners follow universal strategies for processing second language grammar (1993, 1996), as will become clearer in section (3.4.1). These strategies could be connected to universal reasons or reasons related to the learners' first language. From this perspective, VanPatten identified universal principles which account for second language learners' erroneous strategies which they follow in processing the input of a second language. To help second language learners at this stage, VanPatten (1996) suggested a kind of Structured Input Activities in his model which proved to be a promising model for helping learners in processing second language grammar.

#### 2.4.2.3 No-access to Universal Grammar

The third model is 'the no access model'. According to this model, second language learners do not have access to Universal Grammar. That is, Universal Grammar is only available in first language acquisition. Accordingly, SLA cannot be a result of resetting Parameters (see Clashen and Muysken, 1986).

A study which supported this position was by Meisel (1997) where L1 and L2 acquisition were compared. Meisel concluded that second language learners do not rely on Universal Grammar when learning second language structures.

White commented on the no access model terminology as being a 'misnomer' (2003: 16). To White (2003), as long as proponents of this model claim that "adult L2 acquisition is not constrained by Universal Grammar, or that it is only constrained by UG insofar as universal properties can be accessed via the L1 grammar", the term no access is a 'misnomer' (2003: 16). That is, as proponents of this model restrict access to Universal Grammar to be through the first language, the term no access is misleading.

Universal Grammar has also received criticism as a theory focusing on theorising things with connection to mind and competence, isolating the acquisition process from its social context (Mitchell and Myles, 2004). However, regardless of any criticism this theory has received, we cannot ignore that it is one of the most influential theories in the field, as many of the developing theories and hypotheses to present are triggered by Universal Grammar.

### 2.4.3 Pedagogical implications

Since Universal Grammar was and still an influential theory in the field of SLA, many approaches to language teaching were inspired by its explanation of language acquisition. For example, the investigation of language typology and language universals was mainly concerned with investigating the typological variations and universals among learners learning second languages. A well-known example is Keenan and Comrie's 'Noun Phrase Accessibility Hierarchy' (1977) and the revised version Comrie and Keenan (1979) (see section 4.5.2.3.1 for more details on this hypothesis).

Of relevance to the current research is the role of input as a determiner of the possibilities available to children when learning their first language. As already pointed out, Principles are universal while Parameters are developed according to the kind of input children receive. According to the available Parameters in the input, it is assumed that children will be able to set the Parameters for that language. Of course, the role of input in language acquisition is of paramount importance (as nothing can be learned without processing the input), but the important point is to build on this role and try to find a way to help second language learners in acquiring second languages especially in instructed contexts. VanPatten (1996) claims that second language learners should be exposed to structured input without being asked to produce it. By doing so, we are giving learners the opportunity to internalise the input which they will automatically be able to produce once they are ready for this task. The argument is that the way in which telling children learning the first language to produce an utterance correctly does not work, in SLA situations, we should not put pressure on learners of a second language to produce correctly a specific form or structure if they are not yet ready to do so (see section 3.4 for more details on VanPatten's model).

## 2.5 Krashen's Theory of Second Language Acquisition

Different from the Behaviourist' account and the Chomskyan account of language acquisition, Krashen (1982) came up with five different hypotheses to offer his theory of SLA. These hypotheses are the Acquisition-Learning Hypothesis, the Natural Order Hypothesis, the Monitor Hypothesis, the Input Hypothesis, and the Affective Filter Hypothesis (see section 2.8.1 for details about the Affective Filter Hypothesis).

### 2.5.1 The Comprehensible Input Hypothesis

Of relevance to the present study is the Comprehensible Input Hypothesis. In this hypothesis, Krashen (1982) tried to give an explanation of the process of acquiring languages. This hypothesis is connected to the Natural Order Hypothesis. It stipulates that learners develop language competence through the Comprehensible Input they receive. This input "contains i + 1", as Krashen noted where the 'i' stands for the acquirer's level and the '1' is the part of language which is "'a little beyond' where we are now" (Krashen, 1982: 22). According to this, one acquires a language by having comprehension of 'i' and the part of the language that is one step beyond our current level of competence. Krashen criticised the lesson which is designed in such a way as to teach a specific grammatical structure and does not place emphasis on communication. After having enough input focussed on communication, acquirers will acquire ‘i+1’ without deliberately focusing on grammar.

Krashen provides evidence for the Input Hypothesis from children who are acquiring their first language and from those who are acquiring a second language. The evidence from first language acquisition is clear in the effectiveness of caretaker speech from an adult to a child. The Input Hypothesis predicted that the caretaker’s way of talking to a child (the tuned language) was very useful and effective because it did change from an adult like approach to a state that accommodates child’s comprehension.

Similarly, during the acquisition of a second language, learners’ comprehension of the iput depends on ‘i+1'. To illustrate this, Krashen (1982) gave three examples related to foreigner-talk, teacher-talk, and the talk of other second language acquirers. According to Krashen, “modification made in foreigner-talk and teacher-talk are not made for the purpose of language teaching, but are made for the purpose of communication” (1982: 24). Clearly, teacher-talk is used by teachers when communicating with learners in classrooms, whereas foreigner-talk is the language native speakers use when talking to a non-native speaker. The goal of such modifications used in the caretaker’s speech is to help the listener understand their messages during communication.

In addition to the above points, Krashen claimed that the Comprehensible Input also accounts for learners’ production abilities. In Krashen's words, producing the targeted items “…emerges. It is not taught directly” (1982: 22). That is, fluency develops by itself

over time and it is not provided deliberately. So, acquirers will develop linguistic competence in communication after receiving enough Comprehensible Input which will also enable them to use the language accurately.

In spite of the fact that Krashen's Comprehensible Input does not give enough details in relation to the kind of Comprehensible Input that should be provided, it agrees with the Processing Instruction model proposed by VanPatten (1996) in one main point which is facilitating the intake of input. However, in the case of Processing Instruction, this is done through providing learners with Structured Input Activities to help them in processing input.

The important point is that both the Comprehensible Input Hypothesis and Processing Instruction model agree that learners will develop communicative competence as a result of this kind of input, rather than teaching students how to produce the target language. That is, acquisition enables learners to speak (in the case of the Comprehensible Input) while Processing Input enables learners to produce the target items (in the case of Processing Instruction). This means that speaking or producing the targeted items is not a tool as much as it is a result of the Comprehensible Input (in Krashen's terms), and Processing Instruction (in VanPatten's terms). Although Krashen and VanPatten may not agree on many points related to input as they view input from different angles, both stress the superiority of the role of input in language learning (see section 3.4 for details about VanPatten's views in relation to the role of input in language learning).

Some of the research on SLA is in line with the Input Hypothesis. An example is Hakuta (1974) who found that there is a silent period in a child's SLA. The connection between the Input Hypothesis and the silent period could be found in the observation that when an acquirer is exposed to a second language, s/he goes through a stage during which they are only listeners. This stage of listening is important to acquirers of second languages because they try to understand the language around them (similar to children acquiring first languages where they are only listeners). At the same time, learners are trying to build a language repertoire. Acquirers will use this repertoire or language competence in communication later, which is in line with Krashen's Input Hypothesis where "speaking ability emerges on its own after enough competence has been developed by listening and understanding" (1982: 27). An improved situation is presented by VanPatten (1996), who aims to encourage the engagement of learners in classrooms in Structured Input Activities,

which will help them in processing, restructuring, and accommodating the grammar of the second language (see section 3.4).

### 2.5.2 Pedagogical implications

Focusing on input and giving less importance to formal instruction, Krashen and Terrell (1983) developed the Natural Approach, which is based on Krashen's Comprehensible Input Hypothesis. As proponents of the Total Physical Response, Krashen and Terrell (1983) adopted some of the procedures used in the Total Physical Response, such as the silent stage and the focus on meaning ignoring form. However, this does not mean that during this stage learners do not use the language. Rather, what is meant by the silent period is that focus is comprehension. Another characteristic of the Natural Approach is that it relies exclusively on communicative activities (e.g. discussions, games, role-plays, and group work).

Comprehension approaches to language teaching follow the same techniques by giving priority to comprehension, considering production a result rather than a mean for learning (e.g. Winitz and Reeds 1973). For Winitz (1981), implementing the Comprehension approach using listening and reading activities can lead to learning in a stress-free context. This was confirmed in a study by Verspoor and Winitz (1997) in which the authors found that L2 learners can acquire a second language through listening comprehension approach the way they do through writing, reading and speaking.

Other methods could also be seen as branches that focus on the natural approach and, as such, ignore grammatical accuracy, for example, Suggestopedia (Lazanov, 1978), Total Physical Response (Asher, 1982), and immersion programmes (Baker, 1993). For a review of these methods, see Richards and Rogers (2001).

The above mentioned approaches have been criticised, as they give little attention to grammatical accuracy. In particular, Krashen's theory and pedagogy was accused of not giving enough details about the Comprehensible Input (especially in relation to the 'i+1' formula), and it is this lack of explanation that caused criticism of this theory (White, 1987). Besides, it seems that Krashen's Comprehensible Input is not enough for learners to be able to acquire a native-like accuracy in the target language (see, for example, Harley,

1992; Spada and Lightbown, 1989; Trahey & White, 1993). Thus, lack of theoretical ground makes this theory difficult to be tested.

## 2.6 Other Perspectives on Second language Acquisition

### 2.6.1 Cognitive perspectives

Cognitive basis of language learning originates in psycholinguistics, with a focus on the processing processes during language learning. Cognitive theories focus on the symbolic function of language (see Langacker, 1987, 1991), and the Cognitive Processes that underlie the learner' ability to understand and produce languages (see, for example, Tomasello, 2000).

According to Langacker (1987), the grammar of a language is a description of the symbolic association between a meaning and its phonological representation. Accordingly, the grammar of a language is viewed, in Langacker words, as "a structured inventory of conventional symbolic units" (1987: 73). Discussion of Form-Meaning Connection will be discussed in details in section (3.2.2); as for the present section, focus is on the general processes which account for language learning.

Cognitive processes can be explained in the following: after picking up the correct form from the environment, the cognitive processes work to process new coming data as follows: memory processes involve 'controlled and automatic' information processing, borrowing Shiffrin and Schneider's wording (1977). In the view of Shiffrin and Schneider (1977), information processing is a process that depends mainly on memory, which is viewed as a collection of nodes which are of two kinds: inactive nodes (long-term store) and activate nodes (short-term repertoire). Automatic processes work on items stored in long-term memory. Controlled information processing works on new information to become part of the long-term memory (to be automatised i.e. recall them automatically with no effort). Thus, a learned skill which becomes an automatic process will be free from controlled processing where the latter is applied to the new tasks only. So, the ultimate goal is to have tasks which will be eventually automated (for more on automatisation, see Anderson, 1985, 1993; Cheng, 1985; Logan, 1988, 1991; McLaughlin & Heredia, 1996; Schneider & Shiffrin, 1985; Shiffrin & Schneider 1984).

Johnson defined automatisation as “the ability to get things right when no attention is available for getting them right” (1996: 137). Most views on automatisation agree on the fact that automatisation is an important process for developing skills. For example, DeKeyser argues that without automatisation “no amount of knowledge will ever translate into the levels of skill required for real life use” (2001: 126).

DeKeyser (1997) examined second language learners’ development of grammar skills, and found that “learning morpho-syntactic rules is highly skill-specific and that these skills develop very gradually over time, following the same power function learning curve as the acquisition of other cognitive skills. These results are consistent with current skill acquisition theory” (1997: 195- 196). So, according to the above views, SLA is a process which requires learners to develop a skill through being exposed to input, selecting items from this input, practice, restructuring of the erroneous information, and automatising the performance. Selecting items from the input is mainly affected by ‘attention’. Cognitive linguistics stresses the importance of the learners’ attention in attending to the language around them (for more on the role of attention in language learning, see section 3.2.3).

Gass (1997) stressed the importance of not only attention but also Universal Grammar in second language learning. Gass has given an example to clarify her point by referring to the findings where learners who received instruction on one type of relative clauses were able to generalise their knowledge to the other types without receiving formal instruction on them (Hamilton, 1994). The view presented by Gass (1997) can be valid, as attention cannot account for all the complex processes which explain language learning. That is, input alone cannot account for all the knowledge learners have. Learners know about the language more than the things taught to them even if it is on the unconscious level (a point stressed by Chomsky in his account of the innate knowledge humans have).

The role of attention is also present within the psychological paradigm, as it was proposed that unattended items will vanish in short-term memory before being processed to be part of the linguistic system. As for the attended items, they will be stored in long-term memory and then saved for further processes so that they could be used automatically (Shiffrin and Schneider, 1977; Posner, 1992).

It is human nature that learners cannot attend to everything in the input due to memory capacity limitation. Consequently, learners may miss forms which do not carry heavy

semantic meaning, such as grammatical morphemes, and concentrate instead on the forms which carry meaning, such as content words. This could be attributed to what Tomlin and Villa call 'detection' which is the "process that selects, or engages, a particular and specific bit of information" (1994: 192). In other words, it is a process through which items are selected for further processes. This selection may differ from one learner to another, but it is affected by universal principles, as will become apparent in section (3.4.1.1). Within this context, VanPatten states that "detection is a sub-process of attention and is the aspect of input processing most directly related to the derivation of intake" (1996: 16).

Due to its influence, different approaches were inspired by the Cognitive Theory (e.g. the Competition Model, the Interaction Hypothesis, the Noticing Hypothesis (see section 3.2.3.1), the Input Processing hypothesis (see section 3.3.1), and Processability Theory. Focus below is on these approaches, which present different views in relation to language learning.

### 2.6.1.1Effects of information processing approaches on other models

#### 2.6.1.1.1. The competition model

According to the competition model, each language has a set of valid cues as a source of information. In learning second languages, these cues will compete and affect the way learners process sentences. Bates, Devescovi, and D'Amico (1999) summarise this model as being:

> Designed to capture the fact that two languages with the same basic word order (e.g. subject-verb-object, or SVO) can differ markedly in the extent to which learners rely on word order information to assign semantic roles in sentence comprehension, compared with other sources of information like subject-verb agreement (1999: 70).

According to the above quotation, language learners would depend on the most valid cues to process sentences. For example, Bates et al. (1999) referred to English as a language in which word order is 'high in cue validity'. That is, the subject is the doer of the action and the object is the recipient and so on (Bates et al., 1999: 70). So, the competition model is a model for language learning which concentrates on the valid cues in each language as these cues would affect the way learners process input.

#### 2.6.1.1.2 The Interaction Hypothesis

According to the interaction hypothesis, learners acquire a language through conversation. That is, by being exposed to a language in which they will interact and get modification to their talk, learners acquire the language. One of the influential studies which could be considered as the basis for the interaction hypothesis was by Long (1983). Long (1983) started the study with reference to Krashen's Comprehensible Input as a pre-requisite for acquiring a second language. However, for an input to be comprehensible, it needs to be modified (e.g. a teacher talk/ Foreigner-talk) as mentioned above. Thus, modification is crucial in these models. Contrary to VanPatten's model (1996), Long (1983) stressed that it is a modification of interaction or conversation rather than the input that helps in acquiring a language. Such modification includes the use of short and simple sentences (see, for example, Henzl, 1979).

Long's assumption (1983) related to comprehensible interaction could be considered as a reaction to previous linguists who claimed that modified linguistic input was essential for any second language to be learned, such as Krashen (1981, 1982), and recently, VanPatten (1996, 2009). That is to say, according to Long (1983), interaction derives acquisition; as for VanPatten (ibid), he assumes that learners go through a process of internalising the modified input to be part of the linguistic system. Importantly, in VanPatten's model, there is a reference to universal default strategies, which we can connect to Universal Grammar principles. The purpose of the modified input is to help in processing the input which is different from the default strategies. It is not clear whether Universal Grammar is involved in the above processes or not, as none of the above mentioned models was developed with direct clear reference to Universal Grammar. Still, for the researcher, there is an internal factor (Universal Grammar element) that can be involved in the process of acquisition, as input presented to learners cannot be processed without these internal factors that facilitate acquisition.

In the view of Long, input "refers to the linguistic forms (morphemes, words, utterances)" (1983: 127). As for Interaction, it can be explained by "describing the functions of those forms in (conversation) discourse" (1983: 127).

Lightbown and Spada put Long's interaction hypothesis into the following logical formula:

1Interactional modification makes input comprehensible.

2 Comprehensible input promotes acquisition.
Therefore,
3 Interactional modification promotes acquisition (2006: 43).

Accordingly, for input to become comprehensible, learners must be involved in interactional conversation. Long (1983) argued that simple language is not the only mechanism for making input comprehensible as other devices can also be useful for this purpose (Long: 1983, 1996).

The interaction hypothesis has been compared to Vygotsky's sociocultural theory (1978, 1987), which concentrates on individual interaction for developing competence. Sociocultural theory proposes that the human mind is mediated by the cultural artifacts. That is, human beings use language as a symbolic tool. Vygotsky claims that language development takes place as a result of the social interactions between individuals. So, contrary to main stream theories in SLA, the sociocultural theory focuses on learning as a social process in which both culture and mind play a crucial rule. Accordingly, learning is social in the first place, then individual. Nevertheless, as stressed by Lantolf (2004), this does not mean that the sociocultural theory is a theory of culture, as it is more a theory which recognises the role of culturally constructed artifacts on humans' thinking. Of relevance to language learning, the sociocultural theory views language learning as a socially mediated process (Lantolf, 2000; Lantolf & Thorne, 2007). As illustrated by Mitchell and Myles, from a sociocultural perspective, language is a tool to mediate meaning or to acquire meaning. This tool develops as a result of the collaborative activity of negotiating meaning (2004: 200).

Thus, similar to the above account of the interaction hypothesis, from a sociocultural perspective, the second language learner would develop language through this social collaborative activity with others. This view is completely contradicted when it comes to advocators of the information processing approaches to language learning, as will be detailed in chapter 3/ section 3.2 and 3.4.

Back to the Interaction Hypothesis and its pedagogical implications, Long and Crookes (1992) and Skehan (1996) advocated a curriculum which is designed around real life tasks. However, according to Gass and Mackey (2007), "the interaction approach … is primarily focused on how languages are *learned*. Thus, direct application to the classroom may be

premature" (2007: 190). The Interaction Hypothesis and the sociocultural theory are similar in the sense that both view language learning as a process which develops through interactions with others. However, this view has its limitations when it comes to instructed contexts. Classrooms are not real life situations and imitating social contexts is not an easy task. That is, when the target language is not the one language learners use outside the classroom, copying real life situations in classrooms may not develop a language in the way explained by sociocultural theory.

#### 2.6.1.1.3 Processability Theory

Processability Theory is a theory of grammar development for SLA. According to the Processability Theory, learners will be able to acquire syntactic structures which are easy before complicated structures. Pienemann (1998, 2005) has conceptualised Processability Theory as a theory which predicts the processability of structures by learners at different stages in their development of language.

For Pienemann (1998, 2007), learners' acquisition of a language is a gradual development of the computation mechanism for the processing of a second language. That is, a learner's ability to produce a specific structure reflects his/her current status for processing as the "structural options that may be formally possible will be produced by the language learner only if the necessary processing procedures are available" (1998: 4). These procedures are summarised by Pienemann as follows:

1. Lemma access,
2. the category procedure,
3. the phrasal procedure,
4. the S-procedure,
5. the subordinate clause procedure (1998: 7).

So, before assigning a category procedure to a word, the grammatical category of a lemma "i.e. certain semantic and grammatical aspects of a word" (1998: 7) is needed. Besides, the grammatical category of the head of the phrase is a pre-requisite for the phrasal procedure (determining the function of the phrase as a subject, object etc.). Then, the phrase could "be attached to the S-node and the sentential information be stored in the sentence

procedure" (1998: 7). So, processing language follows the above mentioned procedures where the "procedure of each lower level is a prerequisite for the functioning of the higher level" (Pienemann, 1998: 7).

Pedagogically, Pienemann (1984, 1989, 1999, 2007) based his 'Teachability Hypothesis' on the Processability Theory. Within this hypothesis there are stages for acquiring a second language and these stages should be taken into consideration when instructing second languages. This account of language teaching reminds of Krashen's "contains i + 1" (1982). However, the difference is that for Pienemann, these stages should be considered. As for Krashen, he criticised the lesson which is designed in such a way as to teach a specific grammatical structure.

### 2.6.2 Sociolinguistics

Sociolinguistics gave rise to Communicative Methods. However, it also should be mentioned that it is not the only reason for the development of the Communicative Teaching Methods as other theories and theorists had a role in this too.

Communicative Methods came as an alternative to grammar-focused approaches. The Communicative Language Teaching Methods flourished in the 1970s and 1980s. In Richards's and Rodgers' words, "the period from the 1970s through the 1980s witnessed a shift in language teaching" (2001: 71). This shift was a result of the increasing demands to find alternatives to grammar-focused approaches. Alternatives were in favour of Communicative approaches and it was called "the communicative movement" (Richards and Rodgers, 2001: 71).

Communicative Language Teaching Methods aim to equip learners with communicative competence (see Hymes, 1972); in this method, the purpose of language teaching is to help learners in developing communicative competence. So, learners within the Communicative Language Teaching Methods would be involved in meaningful activities which are considered as an authentic version of language use. For a detailed review of the emergence of the Communicative Methods and how it was developed, see Richards and Rogers (2001).

#### 2.6.2.1 From inside the human mind to the context outside

Due to its wide spectrum, it is not an easy task to give a precise definition for sociolinguistics. Meyerhoff remarks that "if I had a penny for every time I have tried to answer the question 'so, what is sociolinguistics?', I would be writing this book in the comfort of an early retirement" (2006: 1). Labov (1970, 1972) predicted that misunderstanding the aims of sociolinguistics could be traced back to the label itself which could be viewed as a field which refers to socially affected domains.

In the wider sense, Holmes defined sociolinguistics as a study in which "sociolinguists study the relationship between language and society" (1992: 1). Another definition is presented by Chambers, who viewed sociolinguistics as "a discipline that sets out to study language in its social uses" (2002: 115). Of course, in studying the relationship between language and society, different sociolinguistic issues can be addressed, such as dialects, the use of language and social attitudes, language variation, style, and language and gender etc. However, focus in this section is on Sociolinguistics and SLA.

What distinguishes sociolinguistics from the above mentioned theorisation of SLA is that it is more concerned about the external factors that affect learning, rather than the internal factors as in the case of most theories of SLA. In other words, language learning is viewed not with reference to the internal processes going on while learners are learning a language; rather, the focus is shifted towards the external context in which learning takes place. Still, this does not mean that sociolinguistics contradicts previous views as much as it adds new insights to them by focusing on the context (for an introduction to sociolinguistics, see Meyerhoff, 2011).

Of relevance to SLA is language variation, which was proposed by Labov (1966, 1972). Investigating variation in learners' language (interlanguage), Selinker (1972, 1992) was initiated as a result of the criticism the Contrastive Analysis Hypothesis has received. So, as it was proved that learners' performance in a second language cannot be just a result of transfer from the first language, as stated above, scholars were encouraged to study learners' interlanguage (for more on variation, see Romaine, 2003).

In general, sociolinguistics study language learning from a different perspective as focus is on the learners' interlanguage, language variation, language in use with focus on

interaction, affect in SLA, and so on (for more on these issues, see Mitchell & Myles, 2004; Gass & Selinker, 2008).

### 2.7 Teaching methods dilemma

From what has been mentioned above it can be said that different theories gave rise to different approaches to language teaching. It is worth mentioning that there has been little agreement in relation to the concept of teaching methods, as what works in a specific context may not work in another for different reasons. As a result, Kumaravadivelu suggested what he called post-method language pedagogy (2001, 2003). The framework for the post-methods pedagogy, as proposed by Kumaravadivelu (2006), consists mainly of particularity, practicality, and possibility.

Particularity refers to the peculiarity of each context (i.e. social context, political and linguistic peculiarities of the context e.g. setting, time allocated to teaching, facilities, and so on). On the other hand, practicality refers to the relationship between theory and pedagogy. A method should be applicable in the real practice. This criterion leaves a space for teachers to theorise what they assume to be the suitable method for a particular context. So, teachers can "theorize from their practice and practice what they theorize" (Kumaravadivelu, 2006: 173). The last element in the framework of post-method pedagogy is possibility, which means that the method should be acceptable in the context in which it will be taught. In other words, teachers and students come to classrooms with their own beliefs which are the same as their identities outside the classroom. In this case, the method should be appropriate in relation to the context in which it will be taught (this includes institutional, economic, political, social, linguistic and cultural appropriateness of the method).

It could be concluded that due to the dissatisfaction of the concept of method, Kumaravadivelu (2001) proposed a more context-sensitive approach to language pedagogy. These context peculiarities are at the centre of the post-method pedagogy. So, what is suitable as a teaching approach in a particular part of the world is not necessary to be successful in another part. Of relevance to the current research is the fact that although the communicative approach is the one which is supposed to be used at schools, English is still taught traditionally due to context-specific reasons (see section 1.2.2 and 1.2.3). However, before judging Traditional Instruction as the only model suitable to be used in a

Syrian context, testing the effects of other approaches is of importance, especially if learners' views are considered (the case of the current research). That is, testing the effects of Processing Instruction in comparison with the one used in Syria, and giving attention to learners' attitudes and reaction towards Processing Instruction would be of importance when considering approaches to teaching English in Syrian classrooms.

## 2.8 Factors Affecting Second Language Acquisition

Learning a second language is not an independent process which takes place in our brains in isolation from society; rather, it is a process in which many factors could affect the learning process negatively or positively. For social psychologists, attitudes towards a specific language may affect learners' proficiency in the target language. According to Ryan, Giles and Sebastian, language attitudes are "any affective, cognitive or behavioural index of evaluative reactions towards different language varieties or their speakers" (1982: 7). What makes things even more complicated is that these attitudes could generally encompass attitudes towards the community and people who talk the targeted language. Below is an overview of the factors which can affect the learning process.

### 2.8.1 Psychological factors

Learning a second language means that learners have a mother language and is viewed as an important part of the learner's personality. In McGroarty's words, "language is an intimate part of social identity" (1996: 3). So, due to having a strong attachment to first language, second language learners' ability to learning the target language could be affected. From this perspective, McGroarty (1996) encouraged language teachers to show respect to the learner' first language when they teach a language as a foreign language (research on learners' motivation has been based on the attitudes and motivation test battery proposed by Gardner, 1985).

An early version of the role of the effects of learners' attitudes on language learning was presented by Krashen (1982), who made a connection between learners' performance and motivation which is usually affected by the social attitudes. According to Krashen (1982), motivation, self-confidence, and low anxiety are factors which affect SLA. So, they may help or hinder the Comprehensible Input. According to this hypothesis, the acquirers' affective filters differ from one person to another. That is, some acquirers will have weak

affective filters, while others have a strong affective filter. According to Krashen (1982), for acquirers who have a strong affective filter, “the input will not reach that part of the brain responsible for language acquisition” (1982: 31); namely, the affective filter hinders the acquisition process in this case. On the other hand, acquirers who have a weak affective filter are expected to be better acquirers as the affective filter helps in this case.

When it comes to classrooms, Krashen (1982) stressed the importance of the classroom, especially for beginners. For adult beginners, the classroom provides more Comprehensible Input than informal contexts. This means that students should be provided with enough Comprehensible Input to be able to use the acquired competence outside the classroom in informal contexts.

In relation to the best teaching methods, Krashen stated that they are those which provide:

> Comprehensible input in low anxiety situations, containing messages that students really want to hear. These methods do not force early production in the second language, but allow students to produce when they are 'ready', recognizing that improvement comes from supplying communicative and comprehensible input, and not from forcing and correcting production (1982: 7).

Krashen did not recommend any method in favour of another; rather, he encouraged teachers to provide a comprehensible input which does not necessary follow a particular sequence of teaching grammatical structures. At the same time, this input should not put any pressure on learners to correctly produce grammar forms. Thus, no focus is given to grammar accuracy since the focus is rather shifted to providing Comprehensible Input, which is claimed to cause development that will, in turn, lead to using the target language. However, there is no reference in Krashen’s theory as to how this would lead learners to be able to use language. What are the processes that will enable learners to produce language after being exposed to Comprehensible Input? In his theory, Krashen’s focus is on the Comprehensible Input, giving no attention to the importance of grammar forms and the way learners associate them with meanings in order to be able to process language. This point will be discussed in detail in section (3.4).

Of relevance are the two kinds of motivation proposed by Gardner (1985, 2001): the first one refers to learners’ willingness to be like native speakers (integrative motivation) and the second one refers to the need for using the language for a specific purpose

(instrumental motivation). For Gardner, (2001) learners who have integrative motivation can be more successful in learning a second language than those who do not.

A contradicting view was presented by McGroarty who confirmed that "there is no single pattern of motivation that guarantees success or failure in all language learning situations" (1996: 10). For McGroarty, this is a result of the fact that the learning process involves many factors (e.g. the learner, the instruction and the social context in which learning takes place). In relation to Instrumental Motivation, McGroarty (1996) suggested that "it would be unwise to ask teachers to devote efforts to encouraging this type of motivation rather than working directly through specific classroom techniques skilled to ensure greater success in language learning" (1996: 8- 9).

A more inclusive view on the role of motivation was presented by Dörnyei (2000, 2001), who agreed on the social dimension of language learning motivation presented by Gardner (1985), but believed that there is more to motivation than that mentioned by Gardner above. Dörnyei identified motivational aspects which were suggested according to the cognitive approaches developed in the1990s (For more on this, see Dörnyei & Schmidt, 2001; Dörnyei, 2005.

### 2.8.2 Social factors

According to Ellis (1994), social factors are of importance due to the direct influence they have on learners as they "determine the learning opportunities which individual learners experience" (1994: 197). To Ellis, these experiences refer to "learners' socio-economic class and ethnic background", which "may affect the nature and the extent of the input to which they are exposed" (1994: 197). Therefore, these socially determined factors might affect the received input by learners.

A related view in this regard is the one led by McGroarty who stated that "language policies … affect several aspects of language education, including decisions related to the time allocated for language instruction, to the language and language varieties chosen as models and media for instruction, to the choice of materials, and to teacher certification …" (1996: 27). That is, as a reflection of the importance assigned to learning second languages, indication could be found in the assigned time or hours for instructing the second language in comparison with the time allocated to teaching the first language. So,

learners are affected not only by the current curriculum but also by the more general social attitudes regarding teaching the targeted language.

Decisions related to the curriculum and hours assigned for teaching the target language are affected by the political system. In McGroarty's words:

> … boards of education typically draw their legitimacy from the political system, not from any particular professional expertise in education; thus their assumptions regarding language and language learning are much more likely to reflect "folk linguistic" theories or commonsense understanding about language … (1996: 30).

So, teachers and learners are affected by the 'commonsense understanding about language' which is usually shaped by the political system. Consequently, this could affect learners' attitudes either positively or negatively, which, in turn, has a direct effect on learners' motivation to learn a language.

Another related framework is the connection between ethnic identity and learning a second language as a factor which may affect learners' performance. In Ellis' words, "the more distance the two cultures are, the more difficult L2 learning is and, therefore, the lower the achievement levels" (1994: 207).

The above mentioned factors proved to be of importance in explaining SLA, as the processes of language learning cannot be considered alone with no reference to learners' motivation for learning that language and also to the peculiarities and status of teaching the second language in that context.

### 2.9 Summary

This chapter has presented an overview of previous influential theories of SLA together with the pedagogical implications of these theories. Psychological factors are not affected by theories of SLA as much as they are learner-dependent (e.g. motivation). Thus, regardless of the theory and its pedagogical implications, motivation can affect the learning process either negatively or positively.

In spite of the fact that not all of the theories mentioned above are theories of input, there is always a reference to the role of input in acquisition. For example, in chomskyan grammar, there is a reference to Principles and Parameters in which Principles are universal while Parameters depend on the input which the acquirers receive. Krashen's Comprehensible Input is also centred on this role of input in language acquisition. Similarly, within the Cognitive approach, it is the input learners are exposed to that affects what gets processed. So, input is at the centre of theories of SLA. Still, this role is affected by the factors outlined above and will further be discussed in the following chapter.

Of most relevance to the current research is the Comprehensible Input presented by Krashen (1981, 1982). This role of input has received criticism due to the reasons outlined above. Thus, not all theories have a solid theoretical ground regarding the role of input, which restrict at some extent their usabilities (applicability in research). This thesis investigates the role of input in language learning, but from a different perspective than the one presented by Krashen. The Input Hypothesis, which the current research is investigating, is based on the cognitive account of language learning supported by noticing, attention, and other universal factors as it will be detailed in the following chapter.

# Chapter Three: Processing Instruction: Theoretical Background and Pedagogical Research

## 3.1 Introduction

Processing Instruction is a focus on form model for teaching second language grammar presented by VanPatten (1996, 2007). This model aims at helping learners in processing input by providing them with specific types of activities which would help in processing input correctly. These activities are claimed to alter default processing strategies followed by learners to more helpful ones.

It should be mentioned in the introduction of this chapter that both Processing Instruction and Traditional Instruction, which will be discussed below, fall within formal instruction. Additionally, it should be mentioned that the choice of Traditional Instruction is just because it is the one used in the context of the present study (Syria). It is important to judge the effects of Processing Instruction by comparing its effects with the type of instruction used in normal English classes in Syria.

VanPatten claims that Processing Instruction "is a focus on form that serves as a supplement to existing communicative and acquisition-oriented approaches" (2000: 52). Although not all the components of Processing Instruction can serve as a supplement to the Communicative approach, Affective Activities can well serve this purpose (see section 3.4.2). In other words, Affective Activities are learner-centred activities during which learners would pay more attention to meaning to show an opinion or pass a judgement. On the other hand, Referential Activities are more oriented towards capturing problematic strategies and to push learners away from them by helping learners in making Form-Meaning Connections and parsing the input. So, Referential Activities requires learners to attend to both meaning and form to answer the activities correctly.

Before proceeding to explain Processing Instruction, the theoretical background underpinning this model will be presented. The chapter will proceed as follows: the first section will sketch out the information processing approach which is originated in Cognitive Linguistics together with presenting a summary of the role of attention in language learning. This will be followed by an overview of the role of input and output in language learning, with reference to pedagogical implications. Subsequent sections focus on the essence of the current research, which is Processing Instruction. Discussion of

Processing Instruction will include the characteristics of Processing Instruction, the nature of the Structured Input Activities (both Referential and Affective), and an overview of previous research on Processing Instruction. The final section will present a summary of the chapter.

## 3.2 Information Processing Strategies

### 3.2.1 Processing second language grammar

The information processing approach to language learning is based on the cognitive theory, which consists of different theories (see section 2.6.1 above). These theories focus on both the cognitive processes that underlie learners' ability to understand and produce languages (Tomasello, 2000) and the symbolic function of language (Langacker, 1987, 1991). Below is a clarification of the first point (cognitive processes), while the second point (symbolic function of language) will be discussed in section (3.2.2).

According to the discussion in section (2.6.1), successful second language acquisition is viewed as a process which requires learners to develop a skill through being exposed to input, selecting items from this input, practicing, restructuring the erroneous information, and automatising the performance. Selecting items from the input is mainly affected by attention, which is an important part of Input Processing. In other words, as a result of working memory capacity limitations, it is more likely that learners cannot attend to everything in the input. This has been attributed to what Tomlin and Villa call 'detection' where they defined 'detection' as the "process that selects, or engages, a particular and specific bit of information" (1994: 192). It is a process through which items are selected for further processes. In this regard, VanPatten states that "detection is a sub-process of attention and is the aspect of input processing most directly related to the derivation of intake" (1996: 16) (see also Wickens, 1984, 1989). So, once an item is detected in the input it can be submitted to further processes to be part of the linguistic system.

Detection is not the only component of attention as Tomlin and Villa (1994) presented alertness and orientation as other components of attention. Alertness is learners' ability to receive information. In other words, alertness can refer to learners' readiness (whether the learner is receptive or not) to incoming data. As for orientation, it refers to learners' attention being oriented towards a specific item rather than others in the input. Orientation

can be manipulated by instructors so that learners' attention can be attracted to a specific item in the input.

One important point to be mentioned within this context is that after selecting items from input and practicing, the restructuring process is not always a successful one. According to VanPatten (2004), only the registered items in the working memory can be accommodated and restructured to become part of learners' underlying language system, and then be ready for use. However, a question to ask is what about the items which are not correctly restructured, would these items be automatised the way they are? There is no focus on this point in previous literature, as focus is usually on restructuring the registered items. Still, as we have the possibility that learners may not restructure the erroneous information, it can be said that these items will be used erroneously the way they are processed. This will be the case till these items are subjected to further processes in later stages where learners may correctly restructure and accommodate these items depending on their level of proficiency, the practice they receive, and the improvement they make in learning.

In brief, information processing deals with the questions related to how languages are learned and how the learner contributes to the learning process as s/he is the processor of the items presented in the input. In the next section, there will be a discussion of the nature of Form-Meaning Connections in working memory. More specifically, the discussion will be of how learners make initial Form-Meaning Connections after being exposed to input.

### 3.2.2 Form-Meaning Connection: factors affecting Form-Meaning Connection

As stated above, according to Langacker (1987), Cognitive Linguistics is mainly characterised by the inherent symbolic function of language. That is, Cognitive Linguistics views the grammar of a language as a matter of associating a meaning to its phonological representation. Accordingly, the grammar of a language is viewed as, in Langacker words, "a structured inventory of conventional symbolic units" (1987: 73). Within this framework, one of the basic features of Input Processing is Form-Meaning Connection. In applying these views to second language acquisition, each symbolic structure (morphology and syntax of the language) stands for a meaning which is used in communication to convey a specific message. Initially, learners pay attention to the important words which convey the meaning of the message (e.g. Cadierno, 1995; Shirai, 2004). VanPatten, Williams, and Rott

have identified some factors which can affect learners' ability in making Form-Meaning Connections (2004). These factors include both learner factors and input factors.

#### 3.2.2.1 Learners factors

Learner factors include first language knowledge, Universal Grammar, and current level of second language proficiency. First, according to VanPatten, Williams, and Rott (2004), first language knowledge has been under investigation and focus due to the crucial role it can play in the acquisition of a second language. In making Form-Meaning Connections for certain forms, first language knowledge can affect a learner of a second language, especially in cases where the second language learners may not be able to process a specific form due to big differences between the form in learners' first language and the targeted language (see VanPatten 2004a).

As mentioned in chapter 2, different views were presented when it comes to the role of the first language in acquiring the second language. Research investigating this role under the Contrastive Analysis Hypothesis gave different and sometimes contradicting results (see section 3.2). Influence of the first language was also continued to be presented in other theories. For example, the different positions which were presented to account for the role of Universal Grammar in SLA (see section 2.4.2).

Second, VanPatten (1996) claims that second language learners are inclined to make Form-Meaning Connections for forms which universally bear more meaning as they enable learners to understand the message (e.g. content words). This inability to make Form-Meaning Connections for certain other forms could be a result of working memory limitations to not being able to attract learners' attention to all the items in the message. Another universal factor which may affect Form-Meaning Connection could be related to forms' frequency in the input and their positions (first and final positions are universally more salient). The last universal factor which can affect Form-Meaning Connection is the one-to-one principle (e.g. Anderson, 1984). The latter principle stipulates that second language learners are, initially, inclined to assign to a specific form one meaning only. This kind of universal inclination may block any other meaning from being associated with that form. According to this principle, learners of English, for example, would process 'will' as the future marker. At this early stage, learners may not associate any other meaning to this

form such as threat: 'I won't forget this', requests: 'will you give me a hand', and so on (for more details, see VanPatten 2004a).

Third, learners' proficiency in the second language may affect Form-Meaning Connections. VanPatten, Williams, and Rott argued that "learners in the early stages of acquisition tend to focus on forms and parts of forms that are crucial for communication and thus are less likely to process grammatical FMCs than lexical forms" (2004: 14). In other words, learners would be more inclined to process lexical items over grammatical forms. As for more advanced learners, VanPatten et al. stated that they "are better able to make use of linguistic context to discover FMCs" (2004: 14). That is, advanced second language learners can make use of the available linguistic knowledge they have to make initial Form-Meaning Connections for new items in the input.

#### 3.2.2.2 Input Factors

Input factors include input frequency and the nature of the form itself in the second language. Ellis argues that frequency is "a key determiner of acquisition because 'rules' of language… are structural regularities that emerge from learners' lifetime analysis of the distributional characteristics of the language input" (2004: 53). That is to say the more frequent a form is the easier it is to make form-meaning connection to this form.

The second feature is the nature of the form itself. As mentioned above, the inherent properties of the form may affect Form-Meaning Connections. For example, form saliency is important for assigning meaning to it. According to Ellis (2004), Form-Meaning Connections may fail if it is not salient. For example, verb inflections are not salient in comparison with temporal adverbs. Thus, the saliency "of the temporal adverbs lead L2 learners to attend to them and to ignore the grammatical tense verb morphemes" (Ellis, 2004: 63). Another feature is what VanPatten, Williams, and Rott (2004) call form complexity. Form complexity could be a result of the one-to-one principle mentioned above, for example. That is, if the form stands for more than one meaning. Another important feature in the form is "the degree to which it might be confused by other similar forms" (VanPatten et al., 2004: 16). That is, similar forms can be confused with others in certain cases (e.g. progressive –ing and gerund –ing in English).

To sum up, the above section explained a theory of Input Processing in second language acquisition. Information processing and Form-Meaning Connection in particular could be of importance as they give deep insights in relation to how learners of a second language process items faced for the first time in the input.

### 3.2.3 The role of attention in processing input

#### 3.2.3.1 The Noticing Hypothesis and its pedagogical implications

Based on a study by Schmidt and Frota (1986), and in connection to the role attention plays in Input Processing, the Noticing Hypothesis (Schmidt, 1990) has been presented to account for the importance of noticing in language learning. This has been translating pedagogically by Rutherford and Sharwood Smith (1985) who are considered two of the pioneers in asserting the role of conscious-raising in encouraging learners to attend to the formal features of a specific language. Some researchers (e.g. Seliger, 1983) would not agree on this point as they believe that language learning is an implicit process as "it is at the unconscious level that language learning takes place" (Seliger, 1983: 187). However, for Sharwood-Smith, the input can ''be selectively manipulated to facilitate acquisition'' (1986: 242-253). In other words, Sharwood Smith (1981) encouraged teachers to deliberately try to raise learners' consciousness of specific features in the input. As a result, Sharwood Smith suggested that input should be "meaningful, interesting, and largely comprehensible (1986: 242).

A modified version of conscious-raising was presented in 1993 according to which Sharwood Smith substituted the term conscious-raising by input enhancement as the first "implies that the learner's mental state is altered by the input; hence, all input is intake" (1993: 176). As for input enhancement, it "implies only that we can manipulate aspects of the input but make no further assumptions about the consequences of that input on the learner" (Sharwood Smith, 1993: 176). This can be connected to VanPatten's differentiation (1996) between noticing and processing as "bringing a form to someone's attention is no guarantee that it gets processed at all or gets processed correctly" (1996: 84). So, in spite of the fact that conscious-raising is important within Processing Instruction, it is not enough for acquisition as it will be detailed in section (3.4) below.

Schmidt (1990, 2001, 2010) argued that the subconscious language learning cannot happen without consciousness, which is a crucial element for noticing to occur. Schmidt (1990)

stressed the importance of noticing in language learning and claimed that nothing can be learned if it has not been noticed. That is, the beginning of acquisition is noticing. This point is in line with information processing approaches to language learning where processors are constrained by working memory limitations as they cannot attend to everything in the input. So, the items which have been noticed are the ones which will be processed. It is for this particular reason that some scholars (e.g. VanPatten, 1998) have stressed the importance of Schmidt's hypothesis.

Back to the learners' inability to notice everything in the input, Schmidt (1990: 143) distinguished some of the factors which may affect processing a specific item in the input (also see Ellis, 1997). These factors include learners' expectations, frequency, perceptual salience, task demands, and proficiency level. Schmidt (1990) connected between learners' expectations and the role of instruction in establishing the expectations where the instructor may "increase the likelihood of noticing features in input through the establishment of expectations" (1990: 143).

Another factor which may affect noticing is frequency discussed above and identified by Ellis (2004) as a universal factor where the more frequent a form is, the more likely it is to be noticed and processed by learners.

Perceptual saliency is another factor which may affect noticing and it refers to the items in the input which are more salient than others. For example, VanPatten stated that "learners prefer processing lexical items to grammatical items (e.g. morphological markings) for semantic information" (1996: 14).

The fourth factor is proficiency in the target language. For Schmidt (1990), individuals' level of proficiency may affect the ability to process input. Skehan (1998) attributed these individual differences to learners' working memory capacity as some would be better processors than others in Input Processing. It is noticeable that the factors detected by Schmidt are very similar to the ones identified by VanPatten VanPatten, Williams, and Rott (2004).

The last factor is task demand. According to Schmidt (1990), the nature of the task could be a factor which forces learners to notice specific linguistic features where it would be impossible to carry out the task without noticing these features (e.g. Anderson, 1985). Task

demands could be closely connected to VanPatten's Structured Input Activities (1996, 2007) as there are tasks that are designed in a way to help learners in processing input.

From what has been mentioned above, it could be concluded that Schmidt's argument is in line with the information processing approach to language learning regarding the role of attention in the learning of a second language. However, with respect to the Noticing Hypothesis there is no reference to how to help learners in processing the noticed items in the input to become part of the linguistic system. Recently, this point has been addressed by VanPatten (2007) as he focused in his model on how to help learners to incorporate noticed items into learners' linguistic system. VanPatten suggested Structured Input Activities as a tool to help learners in processing input (see section 3.4.2 for more about these activities).

## 3.3 The role of input/ output in language learning

### 3.3.1 The Input Hypothesis and its pedagogical implications

Ellis (1994) distinguished the following processes in the course of acquiring a second language: input, intake, acquisition, access, and output. One of the early views related to converting input to intake was presented by Corder (1967) who stated that "input is "what goes in" not what is available for going in, and we may reasonably suppose that it is the learner who controls this input, or more properly his intake" (1967: 165). Corder's statement is considered the basis for researchers who try to investigate learners' development of interlanguage (e.g. Pienemann, 1989, 1998; VanPatten, 1996). This role of input did not vanish over time as the view presented by Corder is still active till present, admitting the crucial role input plays in language learning (e.g. Gass, 1997; Carroll, 2001). In connection to Corder's statement (1967), VanPatten (1998) viewed learners of a second language as the processors who may control what items are to be converted to intake rather than others depending on working memory capacity and attention. Of course, this notion, which is related to stressing the role of the learner as the processor that controls intake, is not in line with early theories of second language acquisition. Using VanPatten's wordings:

> It appears that learners themselves contribute a lot more to acquisition than scholars thought during the height of audiolingualism and behaviorism. Learners must come to the task of second language acquisition with some kind of

> predetermined mechanisms that allow for certain options and not others, mechanism that guide the construction of a linguistic system (1998: 113).

These mechanisms are controlled by the learners and depend on learners' current linguistic knowledge. In other words, what goes in could be controlled by learners' current linguistic knowledge, attention, and their working memory capacity. For clarification, VanPatten presented the following figure, which explains the nature of the processes of acquisition (1998).

Figure 3.1 Three Sets of Processes in second language acquisition and use (VanPatten, 1998: 114)


Not different from the paradigm presented by Ellis (1994) above, VanPatten (1998) assumes that acquisition is a process which consists of several processes: Input Processing, accommodation and restructuring, then, access (production). Accordingly, the first process in acquisition is Input Processing. Learners use input "to construct a mental representation of the grammar that they are acquiring" (VanPatten, 1996: 13). However, according to Ellis' paradigm (1994), not all the information in the input will be processed. Rather, only the comprehended items will be converted to become intake. As defined by Ellis, intake is "that portion of the L2 which is assimilated and fed into the interlanguage system" (1985: 159). This means that not all the input present to learners will be processed. Schmidt has attributed in his article (1990) the processability of some items rather than others to be a result of learners' expectations, frequency of the item, saliency, task demands, and learners' level of proficiency as mentioned above.

Converting items in the input to become intake is the process called Input Processing under which two sub-processes could be identified: Form-Meaning Connections and Parsing. The first sub-process is Form-Meaning Connection, which starts when learners of a second language encounter a new form and then assign a meaning to it. However, it is not always the case that this initial Form-Meaning Connection is complete. One important point which

VanPatten (2004a) stressed in this regard is that at this stage second language learners do not internalise the new data. That is, Input Processing does not mean acquisition. It is only an initial stage in the acquisition process as the items will be available for further processes.

The second sub-process is parsing. Parsing "refers to how learners assign syntactic categories to words they comprehend…. When comprehending an utterance, a major function of the learner's parser is to project syntactic phrases associated with lexical items" (2004a; 31). However, the result of this initial parsing could be erroneous, as learners may depend on the first language parsing strategies in processing second language syntax. This point, has been already stressed by (Bates et al., 1999).

Importantly, in his reflections on why there is a good reason to continue researching the effects of Processing Instruction, VanPatten (2004c) viewed the difficulty in parsing sentences with reference to Pritchett's work (1992). VanPatten (2004c) attributed the difficulty of parsing in a second language to sentence location and to the other reasons related to 'computational burden' such as facing unknown words or failure in accessing the processed item (2004c: 327- 328). As a result, VanPatten presented a principle which may account for this difficulty: 'the Early Constraint Principle'. According to this principle, "the processing of initial element(s) constrains the processing of the rest of the sentence" (2004c: 328). VanPatten claims that this principle may predict the processing difficulties second language learners may face in processing sentences as they may face unknown words. That is, learners have to make Form-Meaning Connections first to be able to proceed in processing the sentence. This problem is restricted to second language learners, as first language acquirers usually know all the meanings attached to words in their native language.

The second process in acquisition is what VanPatten (2004a) calls accommodation and restructuring. VanPatten defined these two processes as "the partial penciling in or complete incorporation of a surface feature (form-meaning connection) of language into developing system" (2004a: 33). Of course, accommodation does not include all the data processed during the Input Processing as a result of the fact that the developing system may not be prepared for the new Form-Meaning Connections "or the connection may simply fade in working memory", as VanPatten put it (2004a: 33).

On the other hand, restructuring "refers to what may happen to the developing system after a form has been accommodated" (2004a: 33). So, accommodation fixes the Form-Meaning Connection which has been made during Input Processing into learners' developing linguistic system. As for restructuring, it is the process by which learners restructure part of the linguistic system in a certain way which suits the newly accommodated data.
Pedagogically, Input Processing has inspired some pedagogical implications such as Input Enhancement, which is mentioned in section (3.2.3.1), and Processing Instruction, which will be discussed in section (3.4).

### 3.3.2 The Output Hypothesis and its pedagogical implications

Away from the primacy of the role of input presented above and as a reaction to Krashen's comprehensible input (1982), Swain (1985, 1993) proposed the Comprehensible Output Hypothesis. According to this hypothesis, learners become conscious of their language when they practice producing that language. Of course, proponents of the Output Hypothesis such as Swain do not claim that there is no role for input in language learning. Rather, it is only a matter of focus. In other words, Swain (1985) argues that the role of input had been exaggerated in previous literature. Consequently, Swain tried to investigate the relationship between input and output. The context of eliciting data was a French immersion program with participants whose first language was English. Swain found that language was acquired through "conversational exchanges in which meaning is negotiated" (1985: 252).

Swain and Lapkin (1995) suggested that output practice triggers mental processes that can affect learners' linguistic system. So, by concentrating on input, Swain (1985) argues that this involves a passive role on the part of learners. As a result, Swain (1985) stressed the role of the learner as an active contributor to the learning process, thus suggesting that producing the target language helps learners in developing competence. This point has also been addressed by VanPatten (1996, 2004b) when he stressed the importance of learners as active processors during Input Processing, as exemplified in section (3.4) below.

Swain (1985) advocates Long's views (1983) related to the assumption that it is through interaction and feedback that language develops. To that end, Swain suggested that interaction "forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intent" (1985: 249). More to the point, output helps in developing fluency in the target language. This fluency is assumed to be a result of

producing the target language repeatedly. Accordingly, learners will be able to develop automaticity.

As a proponent of the interactional model proposed by Long (1983), Swain (1985, 1993) argues that through years of being passively exposed to comprehensible input, learners may not be able to provide accurate grammar in the target language. Swain (1995) attributed this to the fact that learners are not given the opportunity to communicate in the target language. Thus, in the view of Swain, it is through production practice that:

> Learners can 'stretch' their interlanguage to meet communicative goals. They might work towards solving their linguistic limitations by using their own internalized knowledge, or by cueing themselves to listen for a solution in future input (1995: 127)

In other words, pushing the learner to produce the target language could be "the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intended meaning", as Swain put it (1985: 249).

Pedagogically, some would argue that production practices have direct effects on learners' competence (e.g. DeKeyser, 1997, 2001). Others claim that acquisition is rather input dependent (e.g. Wong, 2004a; VanPatten, 2002a, 2002b). However, according to Gass, the point is not about the direct changes which take place in conversation; rather, the main issue is the changes which really affect and make changes to the linguistic system (1997). That is to say, in spite of the fact that output may play a role in developing fluency in the target language, still this issue is not the same as processing and internalising the grammar of a second language which VanPatten (2007) is trying to clarify.

According to DeKeyser and Sokalski (1996), output-based instruction is in line with the skill development hypothesis mentioned above (section 2.6.1). It should be clear at this stage that both output-based instruction or Traditional Instruction and Processing Instruction fall within formal instruction where both of them start with explicit explanation of the targeted form or structure. However, they differ in the practice which follows the explicit instruction.

Indeed, output-based practice usually starts "with mechanical exercises and progress to meaningful and communicative ones", borrowing DeKeyser's and Sokalski's words (1996:

626). After grammar explanation, students get production practice, which includes tasks such as filling in blanks, translating sentences, completing sentences or answering questions. Each mechanical drill has one correct answer and learners do not have to attend to meaning in answering mechanical exercises (see, for example, DeKeyser and Sokalski, 1996). Meaningful exercises include questions which require attention to meaning for giving the correct answer. As for communicative exercises, they encourage the learner to attend to form and meaning and how they are used in communication.

VanPatten's criticism to the above mentioned output-based practice is that it urges learners to produce the target form prematurely (1996). That is, being exposed to explicit explanation for the first time is not enough to start producing the target form.

In concluding this section, it should be noted that depending on the Output Hypothesis proposed by Swain (1985), the mainstream of foreign language instruction follows output-based instruction as an effective model for grammar instruction (e.g. Swain & Lapkin, 1995; Allen, 2000; DeKeyser & Sokalski, 1996; Salaberry, 1997), as opposed to Processing Instruction proposed by VanPatten (1993, 1996).

## 3.4 Processing Instruction

### 3.4.1 Characteristics of Processing Instruction

As "no model of second language acquisition does not avail itself of input in trying to explain how learners create second language grammars" (Gass, 1997: 1), and since input is used by learners "to construct a mental representation of the grammar that they are acquiring" (VanPatten, 1996: 13), VanPatten proposed Processing Instruction as a model for instructing second language grammar. So, it is the crucial role of input in second language acquisition that motivated many researchers to device input-based models for teaching second language grammar (see Piske and Young-Scholten (2009) for a recent review of the crucial role of input in language learning).

Processing Instruction is defined by VanPatten as "a type of grammar instruction whose purpose is to affect the ways in which learners attend to input data. It is… in consonant with both general second language acquisition theory and communicative language teaching" (1996: 2). In this type of instruction, there is an invitation to reconsider the important role explicit instruction has on learners' developing systems by concentrating on

input rather than output. It should be clear at this stage that Processing Instruction is not a model which focuses on form without meaning. Rather, meaning is at the centre of this model. In other words, Processing Instruction is concerned with encouraging learners to attend to both form and meaning even for items which do not carry meaning (e.g. verb inflections). So, in spite of the fact that Processing Instruction is a model which could be adjusted within formal instruction, it is different from other models as it "identifies a potentially problematic processing strategy from the model of IP … and then provides activities that push learners away from that strategy" (VanPatten, 2002: 767). Processing Instruction encourages second language learners to attend to the communicative value of potentially meaningless items, as will be discussed below.

#### 3.4.1.1 Principles underlying Processing Instruction

VanPatten (1996) based his model on two main principles which underlie the theory of Input Processing: the Primacy of Meaning Principle and the First Noun Principle. The first principle refers to the fact that learners of a language would process input by looking for meaning before they process it for form. This point is well-documented in second language acquisition research (e.g. Sharwood Smith, 1986; Chaudron, 1985; Krashen, 1982). As for the second principle, it refers to the universal inclination that learners of a language would interpret the first word in a sentence as the subject, which can lead to misinterpretation of the sentence.

VanPatten (2004b) added five sub-principles to the first principle. This includes the following:

a. Learners process content words in the input before anything else (p. 8)
b. Learners will tend to rely on lexical items as opposed to grammatical form to get meaning when both encode the same semantic information (p.9).
c. Learners prefer processing "more meaningful" morphology before "less meaningful morphology" (p. 10).
d. The preference for nonredundancy principle. (p. 11).
e. The availability of resources principle (p.11).

The first sub-principle under the Primacy of Meaning Principle' refers to learners' inclination to process content words before grammar items. This can be attributed to the limited capacity learners have to attend to everything in the input (see Just & Carpenter,

1992). In other words, due to memory capacity limitations to processing input, learners would be looking for meaning in the input before looking for the grammar of the sentence. Another reason for the Primacy of Meaning Principle is that humans are more inclined to attend to meaning to understand a message, rather than looking for how this message (meaning) is formed linguistically. This principle is closely connected to what has been discussed in section (3.2.3) in relation to attention (Schmist, 1999, 2001; Shawood Smith, 1986, 1993). Previous research presented support for the primacy of content words principle when processing input. For example, Mangubhai (1991) investigated the behaviour of learners when processing input. Mangubhai found that learners are more inclined to focus on content words to get meaning when processing input. This claim has also been supported by VanPatten (1990) where he explored whether learners attend to both form and meaning when processing input. In his study, VanPatten found that learners process input by relying on content words to obtain the meaning first. Again, this inclination to processing content words can be attributed to the limitations of humans' working memory, as we cannot attend to everything in the input, especially when we are introduced to new information. This, in turn, forces the learner to rely on content words to understand the message.

The second sub-principle of the Primacy of Meaning Principle is related to learners' preference to process lexical words over non-lexical words (e.g. –ed verb inflection). For example, the English verb ending –ed gives the semantic indication of pastness. At the same time, an adverb in the sentence can give the same semantic meaning (e.g. the adverb yesterday). In this case, learners would rely on the lexical item rather than the verb inflection to know about the tense. VanPatten added that "*if grammatical forms express a meaning that can also be encoded lexically (i.e., the grammatical marker is redundant), then learners will not initially process those grammatical forms until they have lexical forms to which they can match them*" (2007: 118). That is, learners will process these grammatical items once the lexical corresponding items are processed and became part of the learner's linguistic system. The processing burden which learners face in processing new items in the input is the main reason for not processing everything in the input. Consequently, primacy is to processing lexical items. As for grammar items, they "will be processed later, if at all" (2007: 119). For example, Bardovi-Harlig (1992) investigated the preference of lexical items over grammatical items when both encode the same meaning.

Bardovi-Harlig found that in the early stages of learning, second language learners would be inclined to process lexical items over grammatical items (see also Lee, 1998).

The third sub-principle of relevance to the Meaning Primacy Principle' is related to learners' preference to process more meaningful morphology than less or non-meaningful morphology. By more meaningful, VanPatten (2004b: 10) is referring to "the communicative value" of a form, That is, the contribution of a grammatical item to the meaning of the sentence. For support this sub-principle, VanPatten cited a study by Bransdorfer (1989), who tested subjects' ability to process two non-content words in Spanish (preposition *de* 'of' and the definite article *la*). Bransdorfer found that subjects attended to the non-redundant 'de', but not the redundant 'la'. Bransdorfer attributed this to the nature of these two forms, as 'de' has higher communicative value than 'la'. That is, as 'de' would affect the meaning of Spanish sentence (possession), the absence of 'la' will not. Consequently, subjects were able to detect 'de' but not 'la' in the input they received. Non-meaningful forms can be processed the time meaningful ones are internalised. Processing non-meaningful forms can be connected to the Availability of Resources which will be discussed below.

The fourth sub-principle is "the preference for nonredundancy principle" (VanPatten, 2004b: 11). According to this principle, redundant forms are expected to be processed late, as they offer less semantic value than non-redundant forms. VanPatten provided the English –ing as an example. The English –ing is usually acquired by learners before third person singular –s which is redundant. The –ing verb ending encodes a semantic meaning of progressiveness. As for the third person singular marker –s, it does not carry any semantic meaning. Consequently, learners tend to process –ing before third person singular –s. This is already shown in the research on the Natural Order (e.g. Dulay & Burt, 1973). Again, the processing of redundant and less meaningful items would occur, depending on the Availability of Resources.

The fifth sub-principle is "the availability of resources principle" (VanPatten, 2004b: 11). This principle offers answers to the reason for the processability of redundant and non-meaningful items in the input. It is known that, due to working memory limitations, learners of a second language may not attend to all items in the input. However, some resources (if available) can help in processing redundant and non-meaningful items. In

VanPatten's words "For learners to process either redundant meaningful grammatical forms or non-meaningful forms, the processing of overall sentential meaning must not drain available processing resource." (2004b: 11). These resources include "the proficiency level and the nature of learners' ability to access lexical items they have already incorporated into their linguistic systems", borrowing VanPatten's words (2004b: 12). In other words, learners' proficiency and also their differences in relation to memory capacity will affect the processing of non-meaningful forms. So, in the end, learners will be able to acquire redundant forms once the process of processing input becomes less effortful. So, it seems that these problems related to processing redundant and non-meaningful forms are more relevant to beginner learners as processing is effortful for them at the early stages (for a support of the Availability of Resources principle, see Lee (1999)).

The last sub-principle of the "primacy of meaning principle" is "the sentence location principle" (VanPatten, 2004b: 14). According to this principle, "learners tend to process items in sentence initial position before those in final position and those in medial position" (VanPatten, 2007: 125). In other words, items located at beginning of a sentence are easier to process than those located in middle or end of the sentence. This principle can be connected to form saliency mentioned in section (3.2.2.2) above. It seems that when processing a sentence, learners find it easy to process sentence first and final positions as these positions are the salient ones. For example, in processing English relative clauses, learners would face a hierarchical universal difficulty, as relative clauses usually interrupt the flow of the main sentence.

(3.1) The girl who works in this restaurant is my cousin.

Difficulty in processing the above sentence can be a result of having the relative clause in the middle interrupting the flow of the main sentence 'the girl is my cousin'. Thus, due to its position in the sentence, English relative clauses are usually difficult to process by learners (see section 4.5.2 for a detailed discussion on relative clauses). In support of the Sentence Location Principle, it was found in a study conducted by Barcroft and VanPatten (1997) that learners find items in the initial position easier to process. This is also supported by research on the acquisition of relative clauses, where Kuno (1974) predicted that centre-embedding relative clauses which interrupt the flow of the matrix sentence are more

difficult than right-embedded and left-embedded relative clauses. Kuno attributed this difficulty to working memory limitations in relation to the computational burden in processing this type of relative clause. Thus, the location of relative clauses in the medial position of the sentence presents difficulty for learners.

The second principle is the First Noun Principle according to which learners are inclined to process the first word in a sentence as the agent of the sentence (see Pleh, 1989; Sasaki, 1998). The effects of this principle can differ depending on the target language. For example, in a language like English, learners may have problems in passive sentences, as the first noun is not the subject of the sentence. Three sub-principles under this principle can affect processing items within the sentence: 'the lexical semantics principle', 'the event probabilities principle', and 'the contextual constraint principle' (VanPatten, 2004b: 18). These sub-principles under the first noun principle can affect processing sentences.

The first sub-principle is the Lexical Semantics Principle according to which learners may parse a sentence depending on meaning rather than word order.

(3.2) The cow was kicked by the horse.
The fence was kicked by the horse (VanPatten, 2004b: 16).

In the first sentence, either the cow or the horse can do the act of kicking. Thus, learners may interpret the first noun as the agent. However, in the second sentence, it is only the horse that can do the action, but not the fence. Consequently, semantics would have a role to play in helping learners not to interpret the first word as the doer of the action. Thus, the notion of animacy can play a role in sentence parsing. Gass (1987) supported this notion on animacy when conducted a study in which she found that Italian speakers learning English would rely on cues such as animacy in processing sentences.

In the case of the second sub-principle (the Event Probability Principle), real life scenarios can affect the First Noun Principle. VanPatten (2007) gave the verb 'scold' as an example where learners hearing the sentence "the child scolded the mother" would be affected by real life scenarios. That is, "the probability of real-life scenarios might override the First Noun Principle" (VanPatten, 2007: 123). Consequently, learners would process the word

‘mother’ as the doer of the action, assuming that the language follows object>verb>subject word order.

The last sub-principle which can override the First Noun Principle is the Contextual Constraint Principle, according to which learners would rely less on the First Noun Principle if the preceding context constrains the possible interpretations. The Context Constraint Principle is seen as a helpful resource in parsing, as it helps learners not to misinterpret the first noun in a sentence. For example:

3.3 The man is dead. He was killed by Adam.
Most likely, the context would help learners in interpreting the second sentence as ‘he’ is the patient rather than the agent.

VanPatten’s modified version of the principles (2007) which underlie input processing focused on the primacy of meaning and the first noun principle, restricting the role of language transfer to interpreting the first noun principle. According to the first language transfer principle, “learners begin acquisition with L1 parsing procedures.” (VanPatten, 2007: 122) VanPatten claims that learners of a second language start processing a second language using the strategies available from their first languages. This point is similar to the account presented by proponents of the indirect access model mentioned in the previous chapter, according to which it is through first language strategies that learners access Universal Grammar.

Thus, depending on the above account related to the principles which underlie Input Processing, Processing Instruction is designed to capture the problematic strategies and try to push learners away from those strategies to more helpful ones. To that end, Processing Instruction focuses on Input Processing by using Structured Input Activities to help learners in both processing the target form and making correct Form-Meaning Connections. The following figure clarifies the whereabouts practice (Structured Input Activities) within the Processing Instruction model:

Figure 3.2 Processing Instruction in the foreign language teaching (VanPatten and Cadierno, 1993: 227)


In agreement with the discussion related to the nature of input in Second Language Acquisition, the focus of Processing Instruction practice is on helping learners to attend to input and transferring input to become intake. Significantly, during instruction, pushing learners to produce the target form or structure would be an obstacle, as they will be involved in a task which they are not prepared to answer yet. So, instead of internalising the target form, learners may try to monitor their production and use any resource to fill the gap in their production, such as first language knowledge. This may put pressure on second language learners at this early stage. Thus, in contrast to output-based practice, Processing Instruction encourages learners to attend to the target form. Moreover, it helps learners in converting the data in the input to become part of the developing system so that latter has the time to accommodate the new acquired data. This data will be even enhanced by the Structured Input Activities proposed by VanPatten (1993, 1996). Consequently, learners will automatically be able to access and produce the target form.

In contrasting the Processing Instruction with Traditional Instruction (output-based practice), VanPatten considers Traditional Instruction to be "explanation plus output practices that move learners from mechanical to communicative drills" (2000: 54). The following figure clarifies where focused practice is within Traditional Instruction.

Figure 3.3 Traditional Instruction in foreign language teaching (VanPatten and Cadierno, 1993: 227)

Traditional Instruction does not focus on transferring input to intake. Rather, learners are given explicit explanation; they are then pushed to produce the target structure. Thus, in contrast to the general agreement related to the processes of acquisition (input > intake > developing system > output) mentioned above, Traditional Instruction focuses on the last process to make changes to learners' developing system. Depending on the logical order of language acquisition presented above, output-based focused practice is not convincing. That is, as the first stage is attending to input to transfer the data to become intake, instruction should focus on this particular process as it is of importance when it comes to developing learners' linguistic competence.

It should be noted here that in most of his publications, VanPatten (1996, 2004b, 2007) presented Processing Instruction with beginner learners in mind. That is, Processing Instruction is designed to help beginners and intermediate learners in processing newly presented grammar. Another point worth mentioning is that VanPatten's focus was always on the problematic strategies related to initial Form-Meaning Connections, giving less discussion to what happens next. That is to say, after making Form-Meaning Connections, learners still have to integrate these processed items so that they can understand how these processed items work within the sentence. In spite of the fact that VanPatten (1996, 2007) has discussed this issue theoretically, little attention is given to this issue in research on Processing Instruction, as all focus was usually on Form-Meaning Connections only. In the case of processing English relative clauses, it is not enough for learners to make Form-Meaning Connections, as it is equally important to understand the referential relationship of the processed forms with other items in the sentence (head noun, main sentence, dependent sentence, and so on).

The following section is mainly concerned with the Structured Input Activities. VanPatten and Oikennon (1996) claimed that the positive effects of Processing Instruction are a result of these activities rather than the explicit instruction. It should be mentioned here that the Structured Input Activities are always used as one item, although within these activities we have two types of activities of different nature, as will become clearer below. However, it is not the purpose of this research to investigate the effects of these two types of activities separately. Consequently, they will be investigated as a single entity in the current research in the same spirit as that presented by VanPatten (1996). Although one acknowledges that little, if any, research so far has tried to test their effects separately, it was noticed in the

current research given the participants' feedback and comments that these activities have indeed different effects on learners. Away from participants' feedback, it was noticed that these two types of activities within the Structured Input Activities can serve different purposes. However, to have these two activities as one entity is also useful, as the first type focuses on Form-Meaning Connections while the second one enables us to link the target items to learners' views and experiences. The researcher also added another purpose to the first type which is to help learners in processing English relative clauses on the syntactic level by understanding how the different processed items work and interact within the sentence.

### 3.4.2 The nature of the Structured Input Activities

Processing Instruction involves (1) explicit explanations of the targeted form; (2) explicit reminder of learners' inefficient input processing strategies; and (3) Structured Input Activities (referential and affective). The following table summarises these steps:

Figure 3.4 Processing instruction procedures

| |
|---|
| 1. Explicit instruction |
| 2. Explicit reminder of the problematic strategies usually followed by L2 learner in acquiring the target grammatical item. |
| 3. Structured input activities: referential and affective |

In other words, instruction begins with explicit grammar explanation. Importantly, during explanation, there should be a reference to the problematic areas learners usually face in processing the targeted form. Of course, such a reference cannot be made if the teacher is not acquainted with how languages are learned. More specifically, the teacher should be familiar with the problems usually associated with the acquisition of the target structure. This is one of the issues which restricts the use of Processing Instruction, as language teachers may not always be aware of the problematic processing strategies of the language they are teaching. Thus, applying Processing Instruction involves explaining explicitly these problematic areas related to the target form and why they are problematic. For

example, in explaining English verb tenses there should be a reference to the fact that learners usually depend on lexical items rather than morphological items to know about the tense (e.g. Cadierno, 1995). This is followed by Structured Input Activities.

Structured Input Activities push learners to attend to both form and meaning. However, this does not mean that these activities are used to raise learners' consciousness about grammatical forms the way the aforementioned Sharwood Smith's model (1993) would imply. Rather, these activities are intended to enable learners to attend to form in combination with its meaning by understanding its communicative value. The result of attending to both form and meaning can be manifested in enriching learners' ability to process data in the input to become intake or part of the developing system. To enrich *intake*, it is necessary to provide learners with activities which focus on helping them in processing input. That is, "for acquisition to happen, the intake must continually provide the developing system with examples of correct form-meaning connections that are the results of input processing" (VanPatten, 1996: 84). This is done by the Structured Input Activities, as they give learners the opportunity to be exposed to different samples of the target form. Consequently, they may internalise the target form correctly for it to become part of their linguistic competence. As for production, this is a logical result of internalising the target form.

As mentioned above, there are two types of Structured Input Activities: referential activities and affective activities. Referential activities usually include both oral and written activities. In these activities, answers are set to right or wrong answers, according to which learners show if they have made correct Form-Meaning Connections or not. This kind of activity provides learners with the opportunity to process the target form as they continually provide the developing system with examples of the correct targeted item.

Importantly, instructors should be careful in presenting these activities, as they have to present them in the order necessary for learners to process the target form. So, the aim of these activities is to ensure that learners have processed the target form. For example, the following is an example of the referential activities used by Benati (2001) where the target form was Italian future tense:

(3.4) a) You are going to hear some sentences in Italian. Select whether each sentence you hear occurred in the present or the future. **Keep in mind that future tense forms have the spoken stress in the vowel of the endings (third person)**.

1. a) present b) future
2. a) present b) future
3. a) present b) future
4. a) present b) future
5. a) present b) future

(2001: 123).

In this activity, the instructor did not ask learners to produce the target form after instruction, as focus is on helping learners to overcome a problematic strategy they usually follow in processing Italian future-tense morphology.

The above account of Referential Activities is reminiscent of the Garden Path Technique presented by Tomasello and Herron (1988, 1989). Within the Garden Path Technique, activities are expected to lead learners to over generalise strategies from their first language. The goal is to explicitly provide corrective feedback which, according to Tomasello and Herron (1988), will make learners aware of the exceptions of a grammar rule. For example:

(3.5) Teacher: Here is a sentence using these words: *think* and *problem*. *I thought about the problem.* Now you make one using these words: *talk* and *problem*.
Learner: We talked about the problem.
Teacher: Good. *Argue* and *result.*
Learner: We argued about the result.
Teacher: Good. *Discuss* and *advantages.*
Learner: We discussed about the advantages.
Teacher: No. With *discuss* we do not use *about.*
(Nation and Newton, 2009: 140)

The above example helped in making the learner over generalise what the teacher said so that correction came to raise awareness of mistakes. Activities in Processing Instruction do not work in this way, as the activities should be input-based rather than output-based in the way that the above example is. Besides, Referential Activities are not just about attracting

learners' attention to a specific grammatical rule, as the aim is to help them in putting grammar in their minds first, then to be incorporated into the linguistic system.

On the other hand, Affective Activities include examples for which learners have to "indicate agreement-disagreement, true for me-not true for me"; that is, in such activities, learners give their "opinions, beliefs, feelings, and personal circumstances", borrowing VanPatten's words (1996: 64). Thus, there are no right and wrong answers in Affective Activities. Affective Activities are learner-centred activities. This puts these activities in line with one of the characteristics of communicative language teaching, as suggested by Wong (2004b).

Learners are given sentences which include the target form. The aim is to convert input to intake and to continually provide the developing system with examples of the target structure. Learners are asked whether these sentences could be applied to them or not. The aim of learners' answers is to elicit opinions which can help the teacher to evaluate learners' understanding of the general meaning of the whole sentence. In addition, such activities connect what learners have processed with their own life, which is a tenet in communicative language teaching, as suggested by Wong (2004b) above.

The example below is from VanPatten and Cadierno (1993: 243) to practice object clitics (los):

Each sentence corresponds to something that you might do to your parents. Check which apply to you. Compare your responses with a classmate.

(3.6) -------- 1.Los llamo con frecuencia por teléfono. (I call them frequently on the phone)

-------- 2.Los visito los fines de semana. (I visit them on the weekends)

(5 more items were used)

The above affective activity does not require right or wrong answers from the learners, as it just involves learners in an activity which encourages them to express opinions. Affective activities remind us of Input Flood (Trahey & White, 1993), which is a type of Input Enhancement presented by Sharwood Smith (1993), (see section 3.2.3 above). In Input Flood, after the explicit instruction, learners receive input (usually texts), which includes

many examples of the target form. It is expected that through Input Flood learners will be able to notice and then acquire the target item (for support of the Input Flood effects, see White, 1998; Williams & Evans, 1998; Reinders & Ellis, 2009). So, both Input Flood and Affective activities present the learner with examples of the targeted item with the aim of enriching learners' intake.

Briefly, VanPatten (1996) claimed that these Structured Input Activities give learners the opportunity to be exposed to different samples of the target form. In addition, the Structured Input Activities help learners in overcoming difficulties in the processing process as mentioned above. Consequently, these activities enable learners to internalise the target form correctly to become part of linguistic competence. As for production, it is a logical result of internalising the target grammatical item.

### 3.4.3 An overview of previous Processing Instruction research: inconsistent views

Debate regarding the effects of Processing Instruction began after the publication of VanPatten's and Cadierno's study (1993) in which they claimed positive effects for Processing Instruction on learners' linguistic developing system. This was followed by many replication studies which compared Processing Instruction to not only Traditional Instruction but also to more meaning-oriented approaches to avoid the criticism related to the focus on mechanical drills in output-based activities. For example, Farley (2004) compared the effects of Processing Instruction to a meaning-oriented type of grammar instruction (see Table 3-4 for a summary of the research on Processing Instruction). The main reason for comparing Processing Instruction to Traditional Instruction in previous research is because it is the dominant one in most classrooms when it comes to teaching second language grammar (it is the one used in Syria). Traditional Instruction is also still "the dominant form' used in the U.S.", as stated by VanPatten and Wong (2004: 100).

VanPatten and Cadierno (1993) tested their hypotheses on Spanish object pronouns (see example 3.6). They based their study on The First Noun Strategy as a problematic strategy used by learners of Spanish to assign the role of the agent to the first noun in the sentence. According to The First Noun Principle, Spanish learners interpret the first element in the sentence as the subject, although this is not the case for all sentences in Spanish. Thus, VanPatten and Cadierno (1993) presented activities with the subject at the end of each sentence. During these activities learners were told that in Spanish, it is not always the case

that the subject will be the first word in the sentence. Accordingly, they tried to alter this erroneous strategy by pushing learners to notice the way these words are organised syntactically, rather than assuming the first word to be the subject. The results were in favour of Processing Instruction as the Processing Instruction group improved in both the interpretation and production tasks. They concluded that Processing Instruction is more effective than output-based instruction for second language learners to make Form-Meaning Connections.

However, the results in this study have been criticised by DeKeyser and Sokalski (1996), as different amounts of explicit instruction had been used in instructing the two groups. Furthermore, DeKeyser and Sokalski (1996) criticised the difference in the type of practice where the activities given to the Processing Instruction group focused on meaning, whereas those given to the Traditional Instruction group focused on form. Still, this kind of criticism may not be valid as these differences are a result of the nature of the two types of instruction.

Another study was conducted by Cadierno (1995) for the same purpose on the Spanish past tense verb morphology. Cadierno based the study on the processing principle related to learners' preference to process lexical items over grammatical forms when the two encode the same semantic information. To help learners to process grammatical items, Cadierno (1995) eliminated all adverbs of time from the Structured Input Activities. Results showed that the Processing Instruction Group outperformed the Traditional Instruction Group and the control group in the comprehension and the production tasks. Benati (2001: 102) criticised the treatment in this study as being meaning focused for the Processing Instruction Group and form-focused for the Traditional Instruction Group.

A different study was conducted by VanPatten and Oikkenon (1996) to investigate the reason behind the positive effects of Processing Instruction. Therefore, they tried to find out whether the effects of Processing Instruction are as a result of the explicit instruction or as a result of the Structured Input Activities alone. Three groups were involved: a first group received explicit grammar information, another group received Structured Input Activities, and a third group received both explicit grammar teaching and Structured Input Activities. They found that the group which received Structured Input Activities alone performed better in the comprehension and production post-tests than the group which

received explicit instruction alone. In comparison with the group which received both explicit instruction and structured input activities, there was no difference in performance. So, they concluded that the positive results gained by the Processing Instruction groups are a result of the Structured Input Activities.

The above-mentioned studies are the main early studies which advocated Processing Instruction and found support for it. These studies opened the way for other interested researchers to investigate the role of input-based instruction in Second Language Acquisition. The following studies presented different views related to the effects of Processing Instruction (for a summary of these studies, see Table 3.2/ 3.3 below).

First, Benati (2001) conducted a study on the acquisition of Italian future-tense morphology. Three groups were involved in the study: the first group received Processing Instruction, the second group received Traditional Instruction, and the third group received no instruction. Benati found that the Processing Instruction Group outperformed the other two groups in the interpretation task. As for the production tasks, Benati found that there was no significant difference between the Traditional Instruction Group and the Processing Instruction Group.

A study which presented counter evidence against Processing Instruction was conducted by Allen (2000), who compared Processing Instruction to Traditional Instruction on the acquisition of the French causative with *faire*. Allen found that Processing Instruction was as effective as Traditional Instruction in the interpretation tasks; as for the production tasks, the Traditional Instruction was more effective than Processing Instruction. So, Allen's results raised the question related to the generalisability of VanPatten's and Cadierno's results (1993).

Collentine (1998) investigated the effectiveness of input-based instruction and Traditional Instruction on the acquisition of the subjunctive case in Spanish. Results showed that there was no difference between the two kinds of instruction in both production and comprehension tests. In this context, DeKeyser and Sokalski (1996) argued that the relative effectiveness of production versus comprehension practice depended on the morpho-syntactic complexity of the structure. So, in the same spirit as the skill development theory (see section 2.6.1), they argued that input-based practice is better for comprehension and output-based practice is better for production. They conducted their study on the

acquisition of two grammatical structures (the Spanish clitic object pronoun and the Spanish conditional). However, as a replication study, they did not stick to VanPatten's (1993) model, as they did not identify a problematic strategy in the acquisition of the Spanish conditional. Besides, there was no attempt to change learners' strategy, which should be altered by using Processing Instruction. So, it is not quite clear how extending the results in this study could be authentic when it comes to testing Processing Instruction. However, DeKeyser and Sokalski (1996) concluded that the results of VanPatten's and Cadierno's study (1993) are not generalisable. Table 3.2 summarises the studies which did not found evidence for the superiority of Processing Instruction.

From the discussion presented above, debate related to the effects of Processing Instruction can be summarised as follows: depending on the role of input and output in second language acquisition, how this could be implicationally useful when it comes to input-based/ output-based instruction models. So far, inconsistent views can be spotted from the above studies. As such, further research is still needed. One important point to be mentioned is that most of the aforementioned studies were conducted on the acquisition of one of the Romance languages (French, Italian, and Spanish). So, it could be of importance to test the effects of Processing Instruction on the acquisition of other languages where, unlike previous mentioned studies, the second language is English. Tables 3.2 and 3.3 below summarise the research which supported and contradicted the original results presented by VanPatten's and Cadierno's study (1993).

Table 3.1 Summary of research which supported Processing Instruction

| Author | Types of instruction compared to PI | Targeted structure | duration | Learners' first language |
|---|---|---|---|---|
| Cadierno (1995) | TI and a control group | Spanish past tense | 2 days | English |
| VanPatten and Oikennon (1996) | Explicit grammar only, structured input activities only, and the 3rd group received both explicit instruction and Structured Input Activities | Investigating the reasons behind the positive effects of PI Spanish object pronouns | 3 days | English |
| VanPatten & Wong (2004) | TI and a control group | French causative | 1 day | English |
| Benati (2001) | TI and a control group | Italian future tense | 2 Days | English |
| Farley (2004) | MOI | Spanish subjunctive | 2 days | English |
| VanPatten & Sanz (1995) | A control group. | Spanish object pronouns | 2 days | English |
| Wong (2004) | EI, SI, Control Group | French | 1 day | English |

(PI: processing instruction, TI: traditional instruction, MOI : meaningful-based output instruction; EI: explicit instruction; SI: structured input activities; InI: enriched input instruction)

Table 3.2 Summary of the research which gave counter evidence against Processing Instruction

| Author | Types of instruction compared to PI | Targeted structure | Duration | Learners' first language |
|---|---|---|---|---|
| Allen (2000) | TI and a control group | French causative | 2 Days | Not reported |
| Collentine (1998) | TI and a control group | Spanish subjunctive | 2 days | English |
| DeKeyser & Sokalski (1996) | TI and a control group | Spanish clitic direct object pronouns and conditional | 6 classes | English |
| Salaberry (1997) | TI and a control group | Spanish object pronouns | Not reported | English |
| Eralm (2003) | MOI and a control group | French direct object pronouns | 3 classes | English |
| Toth (2006) | COI and a control group | Spanish anti-causative clitic *se* | 7 days | English |

(PI: processing instruction, TI: traditional instruction, MOI : meaningful-based output instruction; COI: communicative output instruction)

Due to the discrepancy in the results of previous research, VanPatten stated that "as long as classes and materials are meaning-oriented and avoid mechanical and display language, acquisition is fostered, and PI is no better than any other meaning-based instruction with a form focus" (2002: 798). In other words, Processing Instruction was superior in previous research as meaning was at the centre of teaching grammar. Thus, any other type of instruction which focuses on meaning while explaining grammar would be a useful tool as well.

The above review of previous research suggested that Processing Instruction is a useful tool for teaching second language grammar. However, the question remains as to whether the results are generalisable to other constructions and languages, given that learners face different problems in the acquisition of a specific language in a specific context. Most of the research above focused on the acquisition of languages within the Romance language family, especially the acquisition of Spanish with English as the first language. Thus, it is of importance to further investigate the generalisability of Processing Instruction to other

languages with learners whose first language is not English. It is for this reason, many (e.g. Benati and Lee, 2007) have encouraged further research to investigate the utility of Processing Instruction with different constructions to reach to a general understanding of the effectivity of Processing Instruction. In spite of the fact that different results were found in previous research, it seems encouraging to continue researching this area. The stimulating and encouraging debate in previous Processing Instruction research have encouraged the researcher to carry out her research to investigate the effects of Processing Instruction with a different construction (English relative clauses). By investigating this area, the current research can offer a contribution to research on Processing Instruction (see 1.1.2 motivation for the current research)

### 3.5 Summary

This chapter provided the theoretical background of relevance to the current research. Focus is on the Input Hypothesis and Processing Instruction in which the Structured Input Activities play a crucial role. The above account of Processing Instruction does not eliminate the role of output in language learning. The point is, we have to be careful in distinguishing between processing input and developing a skill (fluency in the target language). It is not claimed that Processing Instruction is a model that can help in developing fluency in the target language. Processing Instruction, as explained above, is a model which helps learners in processing input by pushing them away from default processing strategies to more helpful ones.

This account is different from developing fluency in the target language; we cannot ignore the role of communication in developing fluency in the use of language. However, this kind of skill develops over time, and is different from what this thesis is investigating. As mentioned in chapter one, the purpose of this thesis is to test the Input Processing Hypothesis by testing the effects of Processing Instruction on the acquisition of English relative clauses in a Syrian context. With the theoretical framework clear, the following chapter now focuses on the research methodology and the design of the research.

# Chapter Four: Research Design and Data Collection Methods

## 4.1 Introduction

This chapter presents the research methodology and design. The chapter also includes reference to ethical issues in education research and those in the current research. The chapter will proceed as follows: the first section will sketch out the intellectual foundations underlying research methodologies. Section 4.3 describes the reasons for implementing an experimental design. Section 4.4 addresses the ethical issues in education research and the ones in the current research. The subsequent section focuses on the study design. As for data collection methods, they will be presented in section 4.6. Piloting the instruction materials and the actual research will be presented in section 4.7 and 4.8 respectively, ending the chapter with a summary in section 4.9.

## 4.2 Effects of Intellectual Foundations on Research Methodology

### 4.2.1 Why intellectual foundations matter

Before talking about methodology, it may seem appropriate to start this chapter by discussing the philosophical foundations underlying research approaches. These foundations present our beliefs towards the world/ existence (Ontology) and knowledge (Epistemology) (Hofer, 2004). Epistemology and Ontology are at the root of the research and can be tied to overarching paradigms, as set out below.

We all agree that our own beliefs and views would consciously or unconsciously affect our research no matter how hard we try to be objective. So, in forming the framework of our methodology, we are always working according to our understanding of both the world and knowledge. Talking about Epistemology is avoided by some researchers, a point which, according to Richards, “can lead to serious confusion and not a little wasted effort” (2003: 28).

Guba and Lincoln compared one’s views of the world and knowledge to what “cosmologies and theologies do” (1994: 33). Richards (2003) took this comparison to mean that one’s Epistemological and Ontological views are something taken for granted and unarguable. That is, it is “human nature to regard one’s own position as the right one and everyone else’s as misguided” (Richards, 2003: 33). So, for Richards, “it’s possible to waste an awful lot of valuable energy on fruitless attempts to convert the unconvertible”

(2003: 33). This means that focus in research should not be on changing other's beliefs; instead, attention should be on how convincing others are in their positions. This can be done by presenting the value and validity of our research. This leads us to the conclusion that it is not only about the topic chosen, research questions imposed, and methodology followed, but also about being convincing in our choice of the methodology to answer research questions, leaving the quantitative/ qualitative differentiation as just a description of the data being collected.

### 4.2.2 Research paradigms

The ideological and intellectual framework underlying our research needs to be given space and time in the discussion of the research. These intellectual foundations are usually presented with reference to research paradigms. Guba and Lincoln defined the word *paradigm* as follows:

> A paradigm may be viewed as a set of *basic beliefs* (or metaphysics) that deals with ultimates or first principles. It represents a *worldview* that defines, for its holder, the nature of the "world", the individual's place in it, and the range of possible relationships to that world and its parts… The beliefs are basic in the sense that they must be accepted simply on faith … there is no way to establish their ultimate truthfulness. (1994: 107)

According to the above definition, a paradigm can be viewed as the framework within which one can locate his/her Ontological and Epistemological views or, as Richards put it, "our research position" (2003: 33). That is to say, it is only through presenting the paradigm underlying our Ontological and Epistemological beliefs that the basis of our research is clearer. Besides, as stated by Richards (2003) above, one's Epistemological and Ontological views are something taken for granted, as these views are not something that we can test for truthfulness.

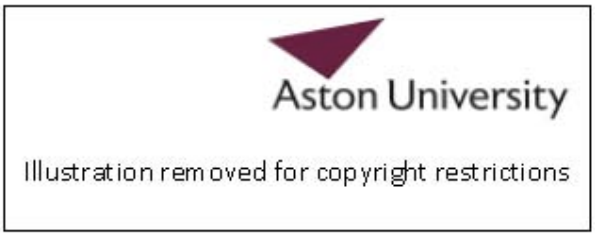
Looking at the paradigm which underlies a study, focus is usually on the approach used in the research and the design for collecting data. That is, whether the research is quantitative or qualitative in explaining the research method and design is what researchers usually focus on. As a result, little attention is given to the paradigms underlying the Epistemology and Ontology of the research in education research. According to Guba and Lincoln (1994), "qualitative and quantitative methods may be used appropriately with any research

paradigm. Questions of methods are secondary to questions of paradigm." (1994: 105). In other words, the main issue is not about having a quantitative method or a qualitative method, as they can fit under any paradigm.

A similar view is presented by Duff (2002), who stated that the differentiation between qualitative and quantitative research "can be both useful and problematic" (2002: 14). It is problematic because we are oversimplifying the research framework, as research could be categorised at many levels (Duff, 2002: 14), and the one which is usually under focus in research is the methodological level (whether the research is quantitative or qualitative or a mixture of the two). Duff criticised research which focuses only on categorising research depending on the methodological level, recommending more attention to be given to the philosophical and ideological paradigms i.e. the Epistemology and Ontology of the research. These two philosophical terms are viewed differently depending on the different available paradigms, as will be made clearer below.

The above is an overview of the importance of the Epistemology and Ontology of the research; focus below is on the four popular paradigms with reference to how these paradigms are viewed Ontologically, Epistemologically, and methodologically (Guba and Lincoln, 1994: 109).

Table 4.1 Summary of the four main paradigms (from Guba and Lincoln, 1994: 109)



According to Guba and Lincoln, Positivists view reality as an apprehendable reality. For a positivist, generating knowledge can be obtained experimentally to collect empirical evidence which supports hypotheses, as noted by Cohen, Manion, and Morrison (2007).

Positivism has been severely criticised for the claim that generalisations can be context-free which, of course, may not always be the case when it comes to social sciences research in general and education research, in particular. Epistemologically, researchers usually detach themselves from the context of the research as having no influence on the objects (participants being investigated). However, this stance has also received criticism as no matter how hard a researcher tries to be clear of any previous knowledge, there is no way that we approach any research as blank slates. It is rarely the case for Positivism to be mentioned without being criticised for its absolute positions (Byrne, 1998; Hammersley and Atkinson, 2007).

Post-Positivism came to address the limitations of Positivism. Post-Positivism could be seen as a paradigm which carries trends of Positivism (reality exists), but this reality is not perfectly reachable. It refers Ontologically to a reality which is "imperfectly apprehendable" due to "flawed human intellectual mechanism and the intractable nature of phenomena" (Guba and Lincoln, 1994: 110). Epistemologically, Post-Positivism is accompanied by objectivity with the probability of true findings. This probability is a result of the difference between Positivism and Post-Positivism, as objectivity is not absolute in the second paradigm (it is assumed that previous knowledge and beliefs affect observations). Thus, findings carry probability within this paradigm. Methodologically, "experimental/manipulative" (Guba & Lincoln, 1994: 110) methodology is the one used for this paradigm. This paradigm is also different from Positivism in the fact that it is carried out "in more natural settings, collecting more situational information ... through the utilization of qualitative techniques" (Guba & Lincoln, 1994: 110). It is this particular point that encouraged scholars to defend Post-Positivism (e.g. Phillips, 1990).

The third paradigm is the Critical Theory. It could be elicited from the name of this paradigm that it came to criticise and consequently improve previous knowledge. So, the socially, politically, and culturally stable factors are re-evaluated and criticised by the Critical Theory to make a better knowledge of reality. Epistemologically, the research is assumed to be a subjective with the "values of the investigator … inevitably influencing the inquiry" (Guba & Lincoln, 1994: 110).

The last paradigm is Constructivism. Ontologically, Constructivism is best presented by Guba & Lincoln as follows:

> Realities are apprehendable in the form of multiple, intangible mental constructions, socially and experimentally based, local and specific in nature (1994: 111).

Thus, realities are socially constructed as they are changeable. Epistemologically, it is through observation that a researcher can develop understanding. Methodologically, methods to be used are usually interpretive and are usually marked by a qualitative approach (for a detailed discussion of research paradigms, see Crotty, 1998). So, within Constructivism, reality is open to multi-interpretation with no generalisations to other contexts, as focus is on the peculiarities of an observation. Thus, instead of focusing on finding logical relations between cause and effect (what positivists do), the focus is on exploring the details of an observation.

### 4.2.3 The Current Research

For the researcher, a quasi-experimental design can be the most suitable design to serve the purpose of the target of the present research. It is through experimental design that the researcher is able to test a theory (Input Processing) and inform practice (the effects of Processing Instruction) at the same time. So, it is the experimental design that can help the researcher to reach to the goals of the research by investigating the efficiency of Processing Instruction in a specific context (a Syrian context). After choosing the topic, it was important to reflect on the methodology which is affected by the researchers' Ontology and Epistemology. It is the experimental design that can serve the purpose of the research (see section 4.3.1).

For that purpose, certain hypotheses were held at the beginning of the research, but interpretation was open, as no predetermined ideas were held. The current research views language learning/teaching to be governed by rules for the learning/teaching process to proceed effectively. Consequently, a teacher is expected to follow established procedures in classrooms to achieve the goals s/he supposed to finish. So, the research aimed at a better understanding and was open to interpretation depending on the findings in this particular context. New knowledge gained from the experiment was not expected to be

generalisable to all other contexts as this was open to future research to either support results or not.

To reflect on the Ontology and Epistemology of the research, it can be said that the current research adopts a Post-Positivist approach if experimental research is classified as a Positivist research. It is also anti-Positivist in the sense that it is context-dependent (a trait from Constructivism). The current research utilised the qualitative approach by focusing on the peculiarity and context-dependent events during the experiment where focus was on the events that accompanied the research inside and outside classroom. Thus, the current research is a quasi-experimental research, which utilised both qualitative and quantitative approaches, as no research can be absolutely quantitative or qualitative (Somekh & Lewin, 2005).

Although research can be a mixture of both quantitative and qualitative approaches, one view is that it cannot be a mixture of two paradigms, according to Guba and Lincoln (1994). Another view is that mixing two paradigms may cause "discomfort" (Crotty, 1998: 15). However, if we restrict our understanding of Positivism/Post-Positivism to using experiments for data collection and Constructivism to interpretive/ naturalistic data, we are erroneously restricting options available to researchers. The current research could be seen as a mixture of the two paradigms mentioned above (i.e. Post-Positivism and Constructivism), as it was possible to see a close connection between the results, students' feedback, and field notes at the same time. That is to say, the peculiarities of the context of the experiment affected the objective results. Thus, in spite of the fact that the researcher was objective in analysing the data statistically with no subjective interference, analysis of field notes and the questionnaire reflected, epistemologically, a truth which is closely connected to the context of the research and to the participants of the research.

For the researcher, although the Post-Positivist views have received criticism as mentioned above, this paradigm has proved to be useful for eliciting new knowledge. A merit of the use of experimental design is that it can move from labs to more contextualised contexts. Within this new framework for Post-Positivism, the peculiarities of the context are of importance, to the extent that they affect the research, the results, and also our views in relation to teaching, as what works in a specific context may not necessary work well in another. It is for this reason that generalisability is questionable in recent experimental

designs in education research, i.e. studies are conducted in natural settings, which is not the norm in traditional experiments which usually take place in controlled labs. Doing these experiments in classrooms can be seen as a positive step, as it is a mixture of the trusted experimental research with Constructivism's context-dependent interpretations.

To summarise the above section, it can be said that although some paradigms were criticised and others were more highly recommended, any paradigm can be the best framework for a specific study, depending on the researcher's Epistemological and Ontological views. As Richards (2003) stated, the question is not about which views are better as much as it is about being convincing in our presentation of the problem and the method for eliciting new data.

## 4.3 The Current Research: A Classroom Quasi-experimental Design

### 4.3.1 Why experimental designs

It seems appropriate to start this section by using a quotation from Cohen, Manion, and Morrison, who stated that "There is no single blueprint for planning research. Research design is governed by the notion of 'fitness of purpose'. The purposes of the research determine the methodology and design of the research." (2007: 78). That is, when it comes to the methodology to be used, it is the goals set by the researcher represented by the research questions that tell the researcher which methodology to use and which design to implement. This, in turn, is affected by the researcher's Ontology and Epistemology, as discussed in the previous section.

Experimental designs are one of the different designs available to researchers in education. Of course, there are no valid/ invalid designs, as each design is usually chosen as the suitable one to answer specific research questions. As suggested by Cohen et al., if the aim of the research is to compare the effects of "intervention", then experimental designs are suitable for this kind of research (2007: 78).

Marsden (2007) stressed the importance of experimental research "despite the complexities and limits of small-scale educational experiments" as "an experimental design which combined a range of methods was able to generate new and useful … substantive knowledge" (Marsden, 2007: 565). That is, in spite of the fact of the problematic issues in experimental designs, this kind of research has contributed to knowledge in SLA. For

example, the importance of experimental research arises from the fact that we can both test a specific learning hypothesis and inform practice. Marsden stated that “finding out whether a theory of learning and/or teaching… is upheld or refuted in the messy environment of teaching practice is a desirable way of refining theory and informing practice” (2007, 565). In other words, it is of importance for research to test a specific theory to help in improving practice.

The current research is an experimental research which was chosen as the most suitable design to answer the research questions (comparing the effects of two different instruction treatments in a Syrian context). Specifically, using this design enabled the researcher to test theoretically Input Processing Hypothesis and pedagogically Processing Instruction as a model for teaching second language grammar (English relative clauses in the current research). An advantage of this kind of design is that it enables the researcher to control variables which may affect research validity, as shown below.

### 4.3.2 Validity and Reliability in Experimental Research

Debate related to the appropriateness, utility, and usefulness of experimental research has received focus and attention in the last few years (e.g. Cook & Payne, 2002; Gorard, 2002; Oakley, 2001; Thomas & Pring, 2004; Elliot, 2001; Hammersley, 2003; Lather, 2004). The point of controversy is questioning the validity of experimental research and the usefulness of experimental research in education to practitioners. Debate has extended to include other issues of whether small and large scale experiments can inform practice or not (e.g. Slavin, 2002; Shavelson, Phillips, Towne, & Feuer, 2003; Torgerson & Torgerson, 2001; Gorard, Roberts, & Taylor, 2004).

One of the problematic issues within experimental research is controlling extraneous variables. Controlling such variables is of importance for the research to be valid and for the results to be reliable (Torgerson & Torgerson, 2001; Hammersley, 2001; Mackey & Gass, 2005). According to Cohen, Manion, and Morrison, “it is impossible for research to be a 100 per cent valid; that is the optimism of perfection". Thus, what a researcher has to do is to “minimize invalidity and maximize validity” (2007: 133). In other words, we are aware of our limitations as humans to reach to perfection in our research. Thus, what we can do is just to do our best to decrease the variables which can affect the validity of the research.

Winter (2000) viewed validity in qualitative research to be in the kind of data being collected (objectivity of the researcher and richness of resources). As for quantitative data, Cohen et al. stated that validity can be “improved through careful sampling, appropriate instrumentation and appropriate statistical treatment of the data" (2007: 133). So, focus should be on the quality of the research by increasing validity of the research through the sampling, intervention used, and analysis.

Below is an overview of internal and external validity in experimental research. The focus below is on the variables of relevance to the current research (for more on research internal and external validity, see, for example, Campbell and Stanley, 1963).

#### 4.3.2.1 Standards for validity

Eisenhart and Howe (1992) suggested five general standards for research validity in education research: (1) “the fit between research questions, data collection procedures, and analysis techniques” (p. 657), (2) “The effective application of specific data collection and analysis techniques” (p. 658), (3) **“**Alertness to and coherence of prior knowledge” (p. 659), (4) “Value constraint” (p. 659-661), and (5) “Comprehensiveness” (p. 662).

The first standard recalls Cohen, Manion, and Morrison’s “purpose of fitness” (2007: 78), according to which a given research methodology should be the best approach to answer given research questions and also to convince the reader of the utility of this methodology. Of course, it is our beliefs about the world and knowledge that direct us towards forming the research questions and hypothesis which, in turn, entails a specific methodology for data collection and analysis.

Within the second standard, Eisenhart and Howe stressed the importance of applying the data collection and analysis techniques in a “technical sense” (1992: 658), which is to say, the credibility of the application of the research design in data collection and analysis. To Eisenhart and Howe, credibility within this standard entails the success and credibility of the findings and conclusions.

The third standard is a critical one, as it is not credibility of the application of the research design that will affect the utility and credibility of the findings; rather, it is how the research is consistent with the theoretical framework of the study. In other words, the

research is not created out of scratch as there must be theoretical foundations for any research. Thus, the research should be in coherence with the theoretical framework.

The fourth standard includes external and internal value constraints. External value constraints "concern whether the research is valuable for informing and improving educational practice", as stated by Eisenhart and Howe (1992: 660). It deals with the worthwhileness of the research results. Eisenhart and Howe (1992) admitted the difficulty of judging research projects due to worrying about the potential bias of these judgements. Of course, this is something to worry about but, still, the important point is to suggest solutions and provide researchers with guidelines of how research could be worthwhile research. To the researcher, research is worthwhile when it relies on a solid theoretical background, when the intellectual foundations of the methodology are clear to the researcher and to the reader, and when the application of the data collection method and data analysis is valid. On top of this, the worthwhileness of research is evaluated with reference to what it offers to the field in general.

On the other hand, internal value constraint refers to "research ethics" as Eisenhart and Howe put it (1992: 661). Internal value validity is of importance to evaluate the research methodology. That is, it is not only the worthwhileness of the research to the field, but also the internal ethical values represented in the research design.

The last standard specified by Eisenhart and Howe puts all the previous standards together for the picture to be complete. That is to say, the previous standards are not taken in isolation from each other as each would affect the other. The study design would affect the conclusions to be driven at the end of the research. So, it is the research questions which are based on recognised issues in education, data collection and analysis, and the conclusions are all joined together and must be coherent in the sense that no contradiction should be found between them for the research to be valid and the results reliable.

With the standards for validity clear, below is an overview of the internal and external validity in experimental research in general and in the current research, in particular. Focus is on the way the researcher managed variables which could have affected the research.

#### 4.3.2.2 Research Internal Validity

Variables which may affect research internal validity should be considered by the researcher before embarking on the research, so that a researcher can improve research validity. Internal validity is related to the different effects of the different treatments. In other words, internal validity refers to "the extent to which the results of a study are a function of the factor that the researcher intends" (Mackey & Gass, 2005: 109). That is, are the results really a result of the different treatments? This can be controlled by limiting the effects of extraneous variables as much as possible, as discussed below.

One of the variables which may affect internal validity of the research is instructors involved in delivering treatments (Morgan-Short & Bowden, 2006). Of course, having more than one instructor could contaminate the internal validity of the research, as there could be a kind of bias in delivering treatments. Additionally, there is no guarantee that different instructors will adhere to the principles of each treatment. For that purpose, the researcher (in the current research) was the only one who gave the three treatments to participants to avoid any contaminating effects caused by having different instructors (Morgan-Short & Bowden, 2006). The normal class teacher did not interfere in the teaching of the targeted form. So, she did not take part in any of the classes on relative clauses. This was intended by the researcher to be the only one to deliver all the teaching materials. The point of doing this is avoiding contaminating the internal validity of the study by not sticking to the rules of delivering each treatment.

Another variable is what students know about the targeted item to be taught. This variable is usually treated by having a pre-test to find out about participants' knowledge of the targeted item under investigation. In the current research, participants were given a pre-test, and all participants who showed target-like knowledge of relative clauses were excluded from the research.

In addition to the above mentioned variables, what students receive during the interval period between the direct post-test and the delayed post-test is considered a major problem, as any interference to raise participants' knowledge could ruin the whole purpose of the delayed post-test. In the current research, the period between the direct post-test and the delayed post-test was of concern, as any new data given to participants during that time could contaminate the validity of the results. So, as recommended by Mackey and Gass

(2005: 148), the researcher planned to have short intervals between the consecutive tests to avoid any extraneous exposure to relative clauses which may affect the reliability of the results. The researcher decided to have the delayed post-test after four weeks only, although it was of interest to test the lasting effects of treatment after a longer period of time. During the four weeks, participants did not receive any instruction on relative clauses as the normal time tenth grade students have lessons on relative clauses was in term two and the research was carried out (including delayed post-test) in term one, 2009. Teachers in Syria usually follow a schedule given to them from the Ministry of Education and they cannot change the order of units in textbooks by giving one before another. The normal class teacher was cooperative in not raising participants' knowledge of relative clauses by not referring to relative clauses during the time between the direct post-test and the delayed post-test.

Bias in allocating participants to groups is identified as another variable which may affect the research validity (Cohen, Manion, & Morrison, 2007). In the current research, the tenth grade at the school where the research was carried out consisted of four groups. The researcher did not change participants' classes as this was not allowed. Thus, as only three groups were needed, section 1, 2, and 3 were included and the fourth section excluded. So, participants remained in their normal classes (Group 1 received Processing Instruction, Group 2 received Traditional Instruction, and Group 3 received no explicit instruction). Thus, randomisation was present in the sense that when first enrolled at the school, students were randomly allocated to these four groups, and the researcher also randomly selected each group for each treatment.

One last important point in relation to the validity of the research is the validity of assessment, which refers to the instruments used to measure "what it is intended to measure" (Carmines & Zeller, 1979: 17). The validity of instruments used in the current research to measure participants' progress after treatment was shown in the results. In other words, instruments are considered valid if participants in the different groups performed differently (see results of the research in chapter 6).

As an experimental study, the validity in the current research is improved by having more than one method for collecting data (i.e. the questionnaire, field notes, and the tests for assessment). Of course, the tests are the main tools used to measure participants' progress.

Still, the questionnaire provided rich data, which proved to be of importance in understanding participants' views in relation to the treatment they received. As for field notes, they provided rich information about events of relevance inside and outside classrooms during the research.

#### 4.3.2.3 Research External Validity

Research external validity refers to "the implications that go beyond the confines of the research setting and participants" (Mackey & Gass, 2005: 119). Of course, the points mentioned above in research interval validity strengthen research external validity. Cohen et al. stated the following:

> Without internal validity an experiment cannot possible be externally valid. But the converse does not necessary follow: An internally valid experiment may or may not have external validity (2007: 157).

External validity lies in the replicability of the experiment. External validity is threatened when a researcher fails to explain "independent variables explicitly" (Cohen, Manion, & Morrison, 2007: 156). This also includes dependent variables. Another point which may threaten the external validity is "lack of representativeness of available and target populations" (Cohen, Manion, & Morrison, 2007: 156).

Of course, the current research did not claim that it is generalisable to other contexts (this can be suggested depending on the findings of previous research and what future research will offer). The researcher was careful to state that due to the restrictions related to a researcher's admission to schools in Syria and to issues related to the nature of the treatments, it was not possible to carry out the experiment in more than one school. Besides, due to extraneous variables which may affect the validity of the research, longitudinal research cannot be used in the case of the current research. Of course, research is usually not evaluated depending on the length of field work; rather, focus is usually on the validity of the research design and reliability and utility of the results. This is confirmed by Norris and Ortega (2000), who stated that the duration of instruction in research does not affect the utility of effects to be found. Thus, while the generalisability of this research to other context is questionable, the replicability of this research is possible.

## 4.4 Ethical Issues in Education Research

### 4.4.1 Ethical Concerns in Education Research

Ethical considerations should always be considered before embarking on the research. Some of these ethical issues could be problematic. As a result of the ethical problematic issues, some have argued that "the ethical dimensions of SLA research appeared to be eschewed or at least left implicit in many publications" (Ortega, 2005: 317). To Cohen et al. "a major ethical problem" is the one "which requires researchers to strike a balance between the demands placed on them as professionals scientists in pursuit of truth, and their subjects' rights and values potentially threatened by the research" (2007: 51). Thus, ethical problems arise when researchers are faced with ethical issues which cannot be managed easily by the researcher. Still, when a researcher is in this situation, a compromise is to deal with the ethical issues in a way which does not break the ethical codes and also in a way which does not affect the validity of the research design. This is the ideal which we cannot achieve easily. Besides, this can also be seen as an ethical problem, as researchers would be inclined to work and make decisions which are of usefulness to their research.

Ethics committees and associations usually impose a list of ethical regulations which should be considered by researchers. These regulations are usually general, according to Cohen, Manion, and Morrison (2007), and may not provide the researcher with the details needed in a specific situation. In other words, as stated by Simons and Usher (2000), different from the traditional view that ethical principles are applicable to all situations, "ethical principles are mediated within different research practices" (2000: 1). Thus, as researchers are usually the ones who know the details of the research, the context of the research, and peculiarities of the context, it is their responsibility to deal with these ethical issues, and to strike a balance between ethical considerations and methodology to be used for collecting data. Unfortunately, this is an ethical issue as mentioned above, as researchers can be biased in making these decisions. So, it seems better to leave this issue open till more regulations are issued by the ethics committees and associations. Below is a review of the ethical considerations in the current research and the way the researcher managed the problematic ones.

### 4.4.2 Ethical considerations in the current research

#### 4.4.2.1 Permission for access and consent

Permission of access "involves the gaining of official permission to undertake one's research in the target community", as stated by Cohen et al. (2007). In the case of the current research, permission for accessing schools in Syria needs permission from the Ministry of Education only. This could be a result of the fact that normal classes will be stopped for the research to be carried out. That is, 18 sessions were needed for the research; these classes were given in the same time allocated for normal classes. As the researcher was sponsored by the government to do the research, she got the necessary permission for accessing the school (appendix I includes the permission letter from the Ministry of Education). The irony is that, in spite of the fact that the researcher got the required permission for her research to be carried out (an ethical requirement), this permission could be seen as an ethical dilemma. This is so because the permission could have caused delay in the progress of normal classes where teachers have to compensate students of the classes taken by the researcher for her experiment. This can be counted as an ethical issue against the researcher in this research. So, again, ethical issues will always arise and a researcher must always try to consider them.

Informed consent from participants is a fundamental requirement in any research (see, for example, Frankfort-Nachmias & Nachmias, 1992, for more on this ethical issue). For that purpose, the researcher was careful to get consent from the principal, participants, and students' parents as students were under 16 (see appendix 3 for the consent from the principal in Arabic with translation provided). After getting permission from the Ministry of Education and the principal of the school, the researcher had the opportunity to talk to the students who participated in the research, in order to explain to them the purpose of the research. The researcher subsequently asked them to read carefully the consent form at home (with the one to be signed by the parents) and, if agreed, to sign their consent form to take part in the research (see appendix 1 for the permission of access; appendix 2 for the translated version of it, appendix 7 for the students' consent form, with the translated version in appendix 8, appendix 9 for the parents' consent form, as students were under 16, with a translated version in appendix 10; and appendix 3 for the principal's permission and appendix 4 for a translated version).

#### 4.4.2.2 Anonymity of participants and confidentiality

This means that participants' identities should be kept anonymous. This can be achieved through confidentiality. The importance of this point was stressed by Frankfort-Nachmias and Nachmias (1992). To Frankfort-Nachmias and Nachmias (ibid), data to be collected should not reveal participants' real identities in any way. This is usually achieved by asking participants not to provide their real names or addresses. Moreover, an essential point is that the researcher must promise confidentiality to participants by not revealing their real names or any kind of information which may indicate their identities.

This was achieved in the current research by maintaining confidentiality at all times, which was confirmed by the researcher at the beginning of the experiment (no reference to participants' real names/ school's real name).

A relevant point to this ethical issue was problematic for the researcher. In other words, the researcher planned to record the classes. However, this has been cancelled, as some participants showed concerns about having their voices recorded and their personalities identified. As a result, the researcher cancelled the recordings and kept field notes, although having recordings could have resulted in richer materials for analysis. So, in the case of this ethical issue, the compromise was for the ethical consideration, as it is completely unacceptable to do the recordings without students' knowledge.

#### 4.4.2.3 Different treatments and new knowledge

An objection to experimental research in education is related to unequal opportunities for participants, as different treatments are usually used to test certain hypotheses. What makes criticism even more severe is including No-instruction groups (control groups) in this kind of research. However, "if experimental designs are refused on the grounds that differential treatment is unethical, then this creates the illogical position that differential teaching styles are acceptable if part of the status quo, but unethical if introduced systematically as part of an experiment" (Marsden, 2007: 571). Thus, if we accept different teaching styles to be taught, there could be no reason for rejecting them in research with the aim of improving teaching methods. However, the important issue pertains to the no-instruction groups, where students in these groups do not receive any instruction on the targeted items. This is, of course, seen as an ethical dilemma, as set out below.

Another ethical issue related to comparing different treatments is interpreting results by making absolute judgements (e.g. judging a treatment as useful while the other is refuted). Marsden (2007) argued that the comparison groups which proved not to be effective in comparison with the other group should not be ignored, as it could be useful in learning another grammatical aspect.

#### 4.4.2.4 Equal opportunities

This ethical issue is closely connected to the new knowledge opportunities mentioned above. This ethical issue can be found in designs where participants do not get the same benefit, especially with experiments involving different treatments with control groups. Including a control group is usually necessary, as it enables the researcher to show the progress of the experimental groups in comparison with the control groups (whether the progress is worthwhile or not). Norris and Ortega (2000) encouraged the inclusion of control groups as comparison groups. The ethical concern of relevance to this issue is the fact that participants in control groups usually miss the possible benefit gained by the experimental groups. This is, of course, one of the ethical dilemmas in research (see Robson, 1993). Robson presented this point as a dilemma in social sciences research. The point is how a researcher can make a balance between the research requirements and this kind of ethical dilemmas; no straightforward answers have been given so far.

In the current research, including a Control Group was necessary in order to evaluate the extent of the progress of the experimental groups (i.e. the Processing Instruction Group and the Traditional Instruction Group). This ethical consideration was not adhered to in the current research as participants in the Control Group had lessons during the treatment period, but they had no explicit instruction on relative clauses. So, it is not that participants had no instruction at all. The ethical issue in this regard is that having a No-instruction Group means that participants in this group did not have the expected benefits that participants in the experimental groups gained. Thus, participants in this group missed something beneficial given to the other groups. To compromise with this ethical consideration, the researcher planned to teach the successful treatment to the other two groups who did not receive it. Unfortunately, it was not possible to deliver Processing Instruction to the No instruction Group and to the Traditional Instruction Group, as permission was only for the main classes needed for the research and no more time was

permitted to deliver the beneficial treatment. Thus, this ethical issue was problematic in the current research. It was only possible to work round this issue by giving treatments materials to the normal class teacher to make them available to interested students.

#### 4.4.2.5 What participants should know about the research?

This is usually connected to deception, and it is more common in social psychology than education research (see Aronson et al., 1990). Cohen et al. (2007) viewed deception as including points such as not telling participants that they are part of research, "not telling the truth", "compromising truth", and "telling lies" (2007: 66). However, if no harm is caused to participants, some have argued that keeping some information from participants for research purposes is justified (see, for example, Cohen et al., 2007). Of course, this ethical issue is usually of more sensitivity when it comes to the kind of research where participants could be harmed- stressed due to not telling the truth to them (see, for example, Campbell & Stanley, 1964).

In the current research, although no harm was caused to students by not telling them that they were taught in three different methods, this ethical issue must be admitted. As the research carried out by the researcher is not a covert research, participants knew that they were taking part in research. However, participants did not know that they were being taught in three different methods (the nature of the three treatments). The concern was that if participants knew about this point, the validity of the research could be affected. Thus, to avoid many extraneous variables as possible, participants were not told they were taught in three different methods so as to test the significant differences between students' performance in the consecutive tests. Cohen et al. suggested that "adequate feedback is provided at the end of the research or research session" (2007: 67).

In a nutshell, debate related to ethics in research is still problematic, and absolute decisions to ethical dilemmas cannot be solved easily. This particular section of the research made the researcher feel that there is injustice in experimental designs as control groups do not usually receive the same kind of benefit gained by participants in the experimental groups. So, although most of the ethical issues were considered in the current research, this particular issue was not adhered to, as having a Control Group is a necessity in

experimental designs. This issue is left open till future research finds the appropriate solutions to these problematic ethical issues.

### 4.5 Design of the Current Research

Before proceeding to data collections methods, it should be mentioned that this study was directed at expanding VanPatten's and Cadierno's study (1993). Also, it aimed at investigating the generalisability of VanPatten's model of instruction (Processing Instruction) to other structures in different contexts by conducting a conceptual replication of VanPatten's and Cadierno' study (ibid). Consequently, as a conceptual replication, this study should follow the general design of VanPatten's and Cadierno's study (ibid) to result in authentic results and to be faithful to the original study. A conceptual replication is different from an exact replication (usually studies conducted under the same conditions) in the fact that:

> Conceptual replications alter various features of the original study and serve the purpose of confirming the generalizability or external validity of the research. Researchers will attempt replication to see if the results hold for a different population, in a different setting, or for a different modality (Polio and Gass, 1997: 502).

This quotation gives the current research more freedom to make changes related to the nature of the targeted construction, components of Processing Instruction, kind of activities, assessment tasks, and data collection methods.

As discussed in chapter 3, in the original study, VanPatten and Cadierno (1993) based their study on the First Noun Principle strategy according to which second language learners assign the role of the agent to the first noun in the sentence. Subjects in their study were students who were learning Spanish (three groups were included in the study: Traditional Instruction, Processing Instruction, and a control group). According to the First Noun Principle, Spanish learners interpret the first element in the sentence as the subject although this is not the case for all sentences in Spanish. Thus, VanPatten and Cadierno (1993) presented activities with the subject at the end of each sentence. During these activities, learners were told that in Spanish, it is not always the case that the subject will be the first word in the sentence. Thus, they tried to alter this erroneous strategy by pushing

learners to notice the way these words are organised syntactically, rather than assuming the first word to be the subject.

Therefore, to test the effectivity of Processing Instruction, VanPatten and Cadierno included three groups: a) a Processing Instruction Group which received explicit explanation and Structured Input Activities, with a reminder of the problematic strategies usually followed by second language learners (learners were never asked to produce the target form); b) a Traditional Instruction Group which received explicit explanation and oral/ written mechanical drills, meaningful drills, and communicative activities; and c) a Control Group which received no instruction on object pronouns.

Thus, to investigate the effectiveness of Processing Instruction, the researcher carried out a conceptual replication of VanPatten's and Cadierno' study (1993) on a pool of Syrian students. In the research, the researcher investigated the influence of both kinds of instruction on processing English relative clauses, as it is one of the complex constructions to be acquired by second language learners, as stated by Doughty (1991).

Intervention lasted for three consecutive days. For assessment, there was a pre-test before intervention, a direct post-test directly after instruction, and a delayed post-test that required production and comprehension abilities from subjects. The purpose of the delayed post-test was to test the outstanding effectiveness of any kind of instruction. To follow up, a questionnaire was used (though the original study by VanPatten and Cadierno (1993) did not include a questionnaire). The purpose of the questionnaire was to elicit data about learners' impressions in relation to instruction in general and in relation to Processing Instruction in particular. Table 4.2 below summarises the research.

Table 4.2 Summary of the research

| |
|---|
| Pre-test (9. 11.2009): two days before instruction |
| Three days treatment (11/11/009- 15.11.2009): (each lesson lasted for 45 minutes), excluding 2 days at the weekend; Friday and Saturday |
| Direct post-test (16.11.2009): the day after treatment;<br>Questionnaire completed by students in the Processing Instruction Group (16.11.2009) |
| Delayed post-test (14.12.2009): four weeks after treatment |

Data was analysed statistically to measure the improvements of subjects in the post-tests in comparison with the results of the pre-test.

### 4.5.1 Participants and classrooms design

Participants in the present research were secondary school students (participants' age range was between 14 and 16). The total number of participants was 66 as three groups were involved in the study. Participants were female. This was not intended by the researcher; it is only because in contacting schools, the researcher got permission from this school (although there are mixed and segregated schools in Syria).

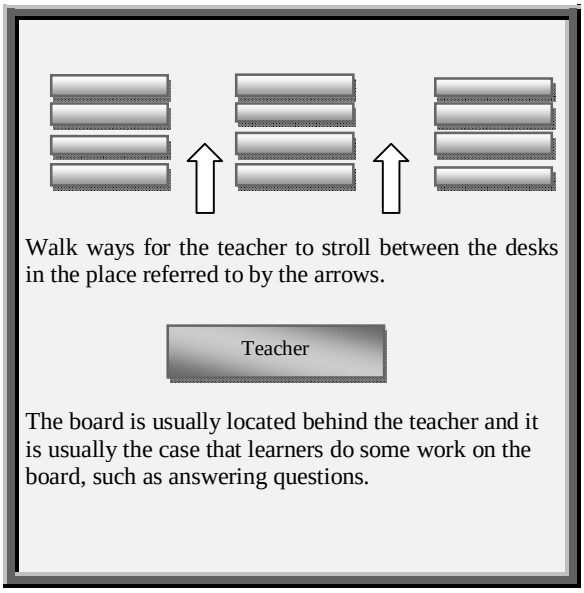
Secondary school students have a background in the use of English as they have been learning English for nine years. Participants share approximately the same educational background in relation to the use of English as they have received the same instruction in English in primary and preparatory schools. However, to have participants who have little or no knowledge of English relative clauses, those who got good marks in the pre-test were excluded from the research, as the aim was to investigate the effects of Processing Instruction on learners who have little or no knowledge of English relative clauses. Of course, all the participants' first language was Arabic. Participants were in the tenth grade, which included four sections. However, as the research set-up needed only three groups, the fourth group was excluded from the research. This was done randomly, as the first three sections were included and section number four was excluded.

Before proceeding to talk about the target form, below is a clarification of the classroom design in which the experiment was conducted. Classroom designs allow for cooperative work between students. State-run schools in Syria have the same classroom design where desks are placed in three lines behind each other. At each desk, there are either one, two or three students, depending on the total number of students in each class. In addition, there are wide walk-ways for the teacher to stroll between the desks (the scene in private schools is different, differing from one school to another depending on how the teacher wants them be seated). However, one of the advantages of students' seating in state-run schools is that all students' faces are to the teacher and the teacher is in control of the class.

Of course, the research was conducted in a state-run school as these schools are more cooperative in these cases than private schools which usually do not give permission for such experiments. Besides, interest was on comparing the effectivity of Processing Instruction when compared to instruction used in state-run schools (i.e. Traditional Instruction). As for private schools, methods of teaching are different as there are more teaching facilities and the approach used for teaching varies depending on the curriculum in each school.

Regarding students' seating in state-run schools where the current research was carried out, it should be said that the seating allows for individual, pair, and group work. Thus, for activities which require work with a partner, at each desk there will be two or three students. The following chart clarifies the seating in the classroom:

Figure 4.1 Students' seating




As the scene is clear, the focus in the rest of this section is on the target form and the nature of the three instructional treatments with the assessment tasks which were used in the research.

### 4.5.2 Target from: English Relative Clauses

#### 4.5.2.1 Why English relative clauses

The choice of English relative clauses was not random. Rather, it was carefully chosen due to the following reasons: it is one of the difficult structures for second language learners to acquire, regardless of their first language, as stated by Doughty (1991). Secondly, the nature of some previous research related to teaching relative clauses, as will be discussed in more detail later on. Thirdly, DeKeyser and Sokalaski (1996) claimed that VanPatten's and Cadierno's study (1993) is not generalisable as the effects are due to the nature of the target grammar structure (Spanish object pronouns). Thus, this research aims to investigate the generalisability of Processing Instruction to other grammar items.

English relative clauses are one of the difficult structures which learners of a second language find difficult to acquire (Doughty, 1991; Suh, 2003) because of their structural complexity. This complexity can be a result of the fact that relative clauses in English involve two clauses where learners have "to process two differing kinds of information simultaneously in production and comprehension", borrowing Suh's words (2003: 132).

The second reason is the nature of research on relative clauses. In spite of the fact that "research on relative clauses has been one of the most active areas in language acquisition studies", as stated by Ito and Yamashita (2003: 247), this kind of research has been directed towards one direction only. That is, research on relative clauses has tried to clarify why relative clauses are difficult and which type is more difficult than the other types (as made clearer below). More specifically, previous research on relative clauses focused on the following three areas in teaching relative clauses: testing the Noun Phrase Accessibility Hierarchy suggested by Keenan and Comrie (1977); testing the Perceptual Difficulty Hypothesis presented by Kuno (1974); and testing the Parallel Function Hypothesis (Sheldon, 1974) (see section 4.5.2.3 below for details about these three hypotheses).

However, very little has been said in previous literature about what kind of instruction can better help second language learners in processing English relative clauses, the focus of the current research. That is, in addition to the above areas of research, there should be more focus on how to teach relative clauses as a complex structure. It is also equally important to investigate the effects of different instructional treatments on second language learners' linguistic system when processing relative clauses. Thus, this research may contribute to foreign language classroom research regarding the effects of different instructional treatments on learners' linguistic system when it comes to processing English relative clauses in a Syrian context.

The third reason for choosing English relative clauses is questioning the generalisability of the effects of Processing Instruction on other grammatical forms and structures. To the researcher's knowledge, no previous research tested the effects of Processing Instruction on processing English relative clauses in a Syrian context.

#### 4.5.2.2 English relative clauses: English and Arabic

An English relative clause is defined by Biber, Johansson, Leech, Conrad and Finegan as "a postmodifier in a noun phrase. It is introduced in English by a wh-word, which has a grammatical role in the relative clauses in addition to its linking function" (1999: 195). That is to say, the wh-word in relative clauses functions as a link to connect the relative clause to the main clause. Besides, the relative pronoun (relativiser) also refers back to the head noun in the noun phrase (i.e. antecedent). For example:

(4.1) Here are the teachers who won the prize.

↓ ↓

antecedent A relativizer which refers back to the antecedent.

In English, we have restrictive and non-restrictive types of relative clauses. In the first type, the information in the relative clause is necessary to be able to determine the antecedent in the main sentence and a comma is not used. As for the second, the relative clause gives additional information which will not affect our understanding of the sentence and a comma is used (see Biber et al. 1999 for more details on the distinction between restrictive-non-restrictive types of relative clauses).

Example:

(4.2) a) Here are the teachers who won the prize (only some did).

b) Here are the teachers, who won the prize (all did).

In English and Arabic, the relative clause is post-nominal in the sense that the relative clause follows the head noun. However, Thompson-Panos and Thomas-Ruzic (1983) identified three main differences between Arabic and English. These differences are maintained when Arab learners process English relative clauses:

- In Arabic, relative particles not Wh-words are used to link two sentences and they are present only if the antecedent is definite. So, if the antecedent is indefinite, then, no relative particle is used, which may result in omitting the relative pronoun when forming English relative clauses:

  (4.3) a. *I met the girl who she has a teacher sister. (Literal translation from Arabic)

  b. *I met a girl she has a teacher sister. (Omission of the relative pronoun is a result of transfer of Arabic).

- The second difference is that in Arabic, there are no subordinate clauses in relative clauses. That is, the relative particle joins two complete and independent sentences. According to Abboud and McCarus (1975), the result is sometimes in two sentences as relative clauses in Arabic are coordinate rather than subordinate. For example,

  English sentence:

(4.4) A. The students who passed all their exams were admitted to university.

Arabic literal translation:

b. *The students passed their exams, and they were admitted to university (this could be one of the forms for avoiding the use of relative clauses).

- The third difference, and it is the one which results in errors which are not easy to change, is what is called pronoun retention. In Arabic, there is "a relator in the relative clause. This is a second word or affix that serves as the subject or object of the clause and refers to the antecedent. When transferred to English, the repetition of referents results in aberrations described by some as "Middle Eastern clauses", as Thompson-Panos and Thomas-Ruzic put it (1983: 618). For example,

  (4.5) a. I met the man whom the police arrested yesterday.

  b.*I met the man whom the police arrested him yesterday.

So, pronoun retention is one of the most problematic issues when it comes to the acquisition of English relative clauses by Arab learners, as learners fill the gap in the sentence with a pronoun (see also Ammar & Lightbown, 2005). The use of such resumptive pronouns can also be seen as a strategy used by second language learners to facilitate processing relative clauses (Hyltenstam, 1994). Another problem is the erroneous use of WHO/ WHICH (as identified by Smith, 1984), as they do not carry any human/ non-human distinction in Arabic, but they do in English.

An overview of the differences and difficulties in processing English relative clauses by Arab learners will be presented in section (4.5.2.4). As for the following section, focus is on the influential hypotheses of relevance to universal factors accounting for the difficulty in acquiring relative clauses.

### 4.5.2.3 Difficulty in processing relative clauses: different hypotheses

#### 4.5.2.3.1 The Noun Phrase Accessibility Hierarchy Hypothesis

The Noun Phrase Accessibility Hierarchy is the result of a study in 1977 by Keenan and Comrie and its modified version in 1979 also by Comrie and Keenan, who compared fifty languages to find out how different languages form relativisation. Their study implies a hierarchy arranged according to the markedness of relative clauses as follows: Subject>

Direct Object> Indirect Object> Object of Preposition> Possessive> Object of Comparison.

The least marked forms are at the top of the hierarchy; then, the hierarchy goes down to the most marked ones. To Keenan and Comrie (1993), the positions up the hierarchy are more accessible and less marked. Consequently, they are easier to process than the ones down the hierarchy.

The importance of the application of the Noun Phrase Accessibility Hierarchy Hypothesis is that it can predict the order which learners of a second language may follow in the acquisition of relative clauses. Consequently, this could make the learning process easier. Izumi (2003) referred to the Noun Phrase Accessibility Hierarchy Hypothesis as an important hypothesis to account for the difficulty in processing relative clauses. Within this context, the Noun Phrase Accessibility Hierarchy found support, as many have suggested that, in studying English as a second language, subject relative clauses are the easiest type to be acquired (Doughty, 1991; Pavesi, 1986; Hyltenstam, 1984; Cook, 1993).

Not all research has supported the Noun Phrase Accessibility Hierarchy. Some have found that teaching the most marked forms of relative clauses down the hierarchy will help learners generalise their knowledge of this marked type to the unmarked ones (for support, see Gass, 1982; Eckman et al., 1988; Ammar & Lightbown, 2005; Hamilton, 1994).

#### 4.5.2.3.2 The Perceptual Difficulty Hypothesis

Kuno (1974) investigated the universal factor of interruption where a main clause is interrupted by a relative clause. Kuno (1974) found that centre-embedding relative clauses which interrupt the flow of the matrix clause are more difficult than right-embedded and left-embedded ones. Kuno attributes this kind of difficulty to short-term memory limitations. For example, sentence (a) below is more difficult to process than sentence (b):

(4.6) a) The cheese that the rat that the cat chased ate was rotten. (Centre embedding)
b) The cat chased the rat that ate the cheese that was rotten. (Right embedding)
(Examples adapted from Kuno, 1974: 119)

This kind of difficulty in sentence (a) can be attributed to the fact that the interrupted matrix clauses should be kept in their short-term memory till they finish the embedded clauses. This is, of course, more demanding for memory, thereby causing perceptual difficulty. So, different from the Noun Phrase Accessibility Hierarchy, which focuses on the type of relative clauses, the Perceptual Difficulty Hypothesis focuses on the position of the relative clause within the matrix sentence. That is, focus is on the function of the head noun and also the relative pronoun in the relative clause. Accordingly, the order of difficulty is as follows: object-subject> object-object> subject-subject> subject-object. Thus, to Kuno (1977), regardless of the type of relative clauses suggested by the Noun Phrase Accessibility Hierarchy, centre-embedding relative clauses are more difficult to process than right-embedding relative clauses. Ioup and Kruse (1977), Schumann (1980), Sadighi (1994), and Suh (2003) supported Kuno's hypothesis.

#### 4.5.2.3.3 The Parallel Function Hypothesis

The Parallel Function Hypothesis suggested by Sheldon (1974) and Bever (1970) focuses on both the functions of the head noun in the main sentence and the relative pronoun in the relative clause. According to the Parallel Function Hypothesis, it is easier to process relative clauses when the function of the relative pronoun is the same as the head noun. That is, when the function of the relative pronoun and the head noun/ antecedent is the same, processing relative clauses become easier. In this case, "SS type and OO type of relative clauses should be easier and quicker to learn than SO type and OS type", borrowing Suh's words (2003: 134). That is to say, subject-subject (SS) and object-object (OO) sentences are easier than subject-object (SO) and object-subject (OS) sentences.

The Parallel Function Hypothesis was criticised, as it was proposed to account for first language acquisition. This made some, like Suh (2003), careful in generalising this hypothesis to L2 acquisition. In Suh's words, "it is not clear how well, or how effectively an L1-based psychological approach can deal with L2 data on relative clauses, and therefore, caution needs to be exercised" (Suh, 2003: 134).

All in all, the above are the most influential hypotheses to account for the difficulty in processing relative clauses. Consequently, research related to relative clauses usually focuses on testing these hypotheses. Although these hypotheses are important and need to

be investigated as they tell us which type of relative clauses is more difficult to process, they do not tell us how to teach this difficult construction.

As a result of the focus in research to test the above-mentioned hypotheses, little attention has been given to how to teach relative clauses. Even when suggestions were made as to how to teach relative clauses, these steps were general. For example, Suh (2003: 139) has suggested that learners should receive more practice on relative clauses after learning how to form relative clauses, without suggesting a specific type of practice (see also Ellis 1994). So, this lack of focus on how to teach relative clauses encouraged the researcher to choose relative clauses to test the effectivity of Processing Instruction.

#### 4.5.2.4 Processing English relative clauses: sources of difficulty

##### 4.5.2.4.1 Working memory limitations and availability of resources

In processing English relative clauses, second language learners are affected by the limited capacity of their working memory. When receiving input, learners as parsers have to assign structural relationships (who did what to whom) among words to understand meaning. By doing so, learners start processing the sentence by looking for meaning. This is because of the limited capacity of human minds. However, some available resources can help learners in the processing of sentences. This is one of the principles presented by VanPatten (2007); that is, if the processing resources are not depleted, learners can attend to grammar forms. Otherwise, manipulating input can be a facilitative factor in this process.

The Availability of Resources mentioned above is an important principle within the Processing Instruction model as it can help the instructor in understanding the universal processing resources that can either help or hinder processing input. Accordingly, input can be manipulated to address these problematic issues.

The important point of relevance to the current research is the fact that working memory limitations can impede Form-Meaning Connections which have a crucial role in internalising information learners receive. Within this context, VanPatten (2007) suggested the principles mentioned in section (3.4.1.1) to account for these difficulties in processing input. To help overcome these problems, VanPatten claims that Processing Instruction can facilitate processing second language input, as this type of instruction alters problematic processing strategies which learners usually follow when processing input. This means that

Processing Instruction would intervene in the processing process to facilitate and speed up acquisition of second language grammar.

The above-mentioned difficulty related to working memory limitations can lead to a deficit in processing progress, which can affect learners' ability to attend to form and meaning when parsing English relative clauses. It is suggested by VanPatten (2007) that learners rely on semantic information when processing grammar forms. Accordingly, learners look for semantic information to help understand a sentence overlooking the syntactic structure or grammatical items in the sentence. This principle seems to play a crucial rule, as learners rely on meaning overlooking the grammar forms.

The situation with relative clauses is a complex one, as it is not only about making Form-Meaning Connections, but also assigning relationships among words in the matrix clause and the relative clause. Another predicted difficulty is presented by the First Noun Principle (VanPatten, 2004b: 16), according to which learners process the first item in the sentence as the subject, which is not always correct. The subject of the main clause is usually overgeneralised by parsers to be the subject of the relative clause as well. This can be attributed to the Active Filler Strategy (Frazier & Clifton, 1989), according to which, a parser locates relative pronouns in the first gap position encountered in the sentence which is after the subject in this case.

According to what has been mentioned above, it can be said that, due to working memory limitations, learners are expected to start processing English relative clauses, looking for meaning by focusing their attention on lexical cues in order to get meaning. On the other hand, according to VanPatten's Availability of Resources Principle (2007), learners will attend to form or linguistic items only if their processing resources are not used up. These resources are not the same, as some learners may have a better working memory capacity/ better attention capacity than others. Another point is that learners' proficiency can also affect the availability of resources. Accordingly, the role of instruction is to facilitate and help learners in processing grammar items, thus, sparing more attentional resources.

One way to spare attentional resources in this research is to locate the relative clause and the head noun in salient position (start of the sentence). Another way to spare attentional resources is to use familiar words during instruction and in the activities (this was checked with the class teacher). Depending on the 'availability of resources principle' (VanPatten,

2004b: 11), learners can process non-meaningful forms if processing resources are available. Keeping this principle in mind, during instruction, the researcher used vocabulary (in the examples and activities), that was known by participants (that was checked with the normal class teacher). So, instead of distracting learners' attention with new unknown vocabulary, all vocabulary used was already learnt by participants. Still, during instruction, it was often the case that learners stopped the teacher to ask about the meaning of a word. In this case, the teacher gave the meaning directly as there was no time to give them examples to induce the meaning themselves. Giving the meaning was done by presenting a familiar synonym; if the synonym was not familiar to the learner, the Arabic meaning was given. The reason for doing so is to help learners focus on relative clauses, rather than looking for unfamiliar vocabulary, so that not all the processing resources are used up.

We all agree that learners do not come to the task of processing as blank slates. Learners can use different resources to help in processing new presented grammar forms and structures. For example, the plausibility of what is possible and what is not possible (semantically speaking) can also have a role in processing English relative clauses.

(4.7)

The man who was kicked by the horse was taken to hospital.

In the above sentence, it is more likely that, depending on the plausibility of the meaning of the sentence, learners would process the first item as the patient rather than the doer of the action. Thus, in this case common sense is an available resource which can help in processing input.

(4.8)

a. The builder who witnessed the accident angered the policeman.

b. The builder whom the accident terrified angered the policeman.

c. The accident which terrified the builder angered the policeman.

d. The accident which the builder witnessed angered the policeman.

Animacy as a lexical cue can be considered as a resource which learners can depend on to get the meaning of the sentences. By doing so, learners are overlooking the linguistic features and linguistics forms, focusing their attention on meaning.

Thus, it can be concluded that Form-Meaning Connections are affected by the principles presented by VanPatten (2004b), as these universal principles can result in problematic processing strategies. Within the Processing Instruction procedures, the second element (reminder of learners' problematic processing strategies) can be considered as a facilitator to help learners in processing input, sparing attentional resources so that learners can attend to not only meaning but also form.

Thus, keeping the points mentioned above in mind, an instructor can help learners in processing grammar items in the input. To make Form-Meaning Connections, learners have to understand the communicative value of a form so that they can process and internalise it. So, elements of the target form should be explained and presented to learners so that they can understand how the form can encode a meaning. Form-Meaning Connections to individual items are not enough. In processing English relative clauses, it is important for learners to process the interaction between the individual items being processed as well. This issue has not been addressed in previous Processing Instruction research, as focus was usually on helping learners in making Form-Meaning Connections to grammar items in a sentence. However, how these processing items would interact with the rest of the items did not receive enough attention in the Structured Input Activities of previous research.

Sections 4.5.2.4.1.1 and 4.5.2.4.1.1 below present a discussion of additional issues which may account for the working memory limitations when processing English relative clauses.

#### 4.5.2.4.1.1Computational burden

As mentioned above, the English relative clause is a complex construction as we have two clauses, and it would be an effortful task for learners to process two clauses with two meanings at the same time. Cook (1979) and King and Just (1991) attributed the difficulty of processing relative clauses to working memory limitations and linguistic constraints.

In processing English relative clauses, some of the processes can create a burden for learners. For example, understanding the co-referential relationship between the head noun

and the relative pronoun can be an effortful process for learners. Another processing burden is processing the gap in the sentence. In English, word order of a relative clause involves a gap position. This gap is filled with a resumptive pronoun in Arabic. “Filler-gap dependencies are hard to process”, as stated by Hawkins (2004: 173).

Filler gap dependencies is one of the problematic issues when it comes to Arab learners’ acquisition of the English relative clause, as they are usually inclined to fill the gap through the use of a resumptive pronoun (see example 4.5). The computation difficulty of filler-gap dependencies can be determined by the number of lexical items intervening between the head noun and the gap in the relative clause (gap refers to the deleted noun which the relative pronoun replaces) (Gibson, 1998; Grodner & Gibson, 2005).

Importantly, the resumptive pronouns Arab learners usually use in English relative clauses are not arbitrary. In other words, resumptive pronouns are usually used in a systematic way in the gap (the site from which a noun has been deleted to be substituted by a relative pronoun). It seems that the use of these resumptive pronouns is transferred from Arabic as the gap is usually filled with a pronoun in Arabic. Thus, learners use a resumptive pronoun so that the sentence makes more sense to them as they are looking for meaning, rather than at how relative clauses are structured.
Example of the use of resumptive pronouns:

(4.9) *The picture which you are looking at it was painted by Picasso.

So, depending on the above problems related to processing relative clauses, activities in the Processing Instruction are designed to address these problems following the guidelines presented by VanPatten (1996), as presented in section (4.5.3).

#### 4.5.2.4.1.2 Sentence location and word order

Having a sentence within a sentence causes difficulty for Syrian learners as relative clauses differ from simple sentences by having a clause within the main sentence, which causes difficulty in processing relative clauses. So, the second processing problem related to processing relative clauses is connected to VanPatten’s Sentence Location Principle (2007). According to this principle, learners find elements in initial sentence position easier

to process than those in medial and final position. This is a result of the fact that the "sentence initial position is more salient than sentence final position that in turn is more salient than sentence internal or medial position" (VanPatten et al., 2004:13). Carroll (2004) viewed the Sentence Location Principle as a constraint on parsing sentences.

The difficulty in processing relative clause thus arises more when learners process object relative clauses than with subject relative clauses as "subject relatives are relatively regular in their word order because this structure has the same word order as simple active one-clause sentences, which are very frequent in English" (MacDonald & Christiansen, 2002: 40). That is, the comprehension processes of subject relatives are the same as the learners' knowledge of simple sentences. Consequently, they may not find difficulty in processing them. As for object relative clauses, they have irregular word order which may hinder the processing process. Students follow their understanding of normal simple sentences in processing object relative clauses. The problems arise when learners face the reality that this is not the case for all types of relative clauses.

Thus, in this study, it was a concern that students had to process items in medial position to be able to identify the type of relative clauses and to use the correct relative pronoun. It is not enough to process the initial sentence position to be able to know the correct relative pronoun which should be used, as the initial position usually includes the antecedent, which may not give many cues about which relative pronoun should be used. Thus, students had to process items in medial and final sentence positions to be able to interpret who did what to whom.

Sentence location could be connected to Kuno's prediction (1974) regarding the difficulties learners face in processing relative clauses. Kuno (1974) predicted that centre-embedding relative clauses which interrupt the flow of the matrix sentence are more difficult than right-embedded and left-embedded ones. Kuno attributed this kind of universal difficulty to short-term memory limitations. That is, centre-embedded relative clauses interrupt the flow of the main clause, which is not the case in right-embedded and left-embedded relative clauses where there is no interruption (for reviewing support of the Perceptual Difficulty Hypothesis suggested by Kuno (see Ioup and Kruse, 1977; and Schumann, 1980).

Kuno's views (1974) are in line with those of cognitive psychologists. For example, MacDonald and Christiansen stated that "subject relatives are relatively regular in their word order because this structure has the same word order as simple active one-clause sentences, which are very frequent in English" (2002:40). Thus, learners' previous experience with simple sentences (with canonical word order) is less relevant in the case of direct object relatives than subject relatives. That is, in the subject type of relative clauses, we have canonical word order which is easier to process than object types of relative clauses where we have non-canonical word order (MacDonald and Christiansen, 2002). In MacDonald and Christiansen's words:

> Subject relatives are relatively regular in their word order because this structure has the same word order as simple active one-clause sentences, which are very frequent in English…. Object relatives, however, have a more irregular word order (e.g., the direct object in the relative clause precedes the verb), and thus experience with simple sentences is less relevant (2002: 40).

This reminds us of the available resources mentioned above, as learners would resort to the available resource (their knowledge of simple sentences in English) when processing English relative clauses. Sentence relation can hinder processing relative clauses. The general assumption in relation to sentence location is the one presented by VanPatten where "learners tend to process items in sentence initial position before those in final and those in medial position" (2007: 125).

Thus, in the present research, the Structured Input Activities were designed in a way to capture the problematic issues in relation to Arab learners' processing of English relative clauses (see section 4.5.3.1).

#### 4.5.2.4.3 Arabic language transfer

Schacter (1974) stated that the difficulty Arab learners face in acquiring English relative clauses is a result of the similarity between Arabic and English relativisation system. In other words, the similarity between Arabic and English relativisation systems causes particular problems to Arab learners, as learners overgeneralise the similarity between the two languages and start using first language processing strategies to interpret and produce

relative clauses in English (see also Kharma, 1987). So, erroneously, learners whose L1 is Arabic start processing English relative clauses using the processing strategies available from their first language.

- Who: learners whose L1 is Arabic are usually inclined to use WHO as they overgeneralise their knowledge of Arabic where WHO is the equivalent of (اللذي: *allathee*) is the one used for human/non-human and subject/object relative clauses.
- Whose: no Arabic equivalent is available for WHOSE. So, students usually use 'who her/who his' instead of WHOSE, which is the Arabic version of possessiveness (Kharma, 1987).
- Resumptive pronouns or "Middle Eastern clauses", to borrow the words of Thompson-Panos and Thomas-Ruzic (1983: 618).

In the principles suggested by VanPatten (2004b), reference to first language transfer was restricted to the First Noun Principle according to which learners would depend on either the universal principles or the properties of the first language when processing the first item in a sentence. This principle is extended by the researcher to include Arab learners' adoption of first language processing strategies (default) when processing English relative clauses, rather than the specific strategies in the second language at this early stage.

For the researcher, restricting the role of the first language to only processing the first item in the sentence in the second language is not a convincing one. That is, for the researcher, the Arabic language is an available resource for learners to compensate for the deficit in their developing system. Thus, Syrian (Arabic speakers in general) learners will use the available processing resources in their first language when processing English relative clauses. The processing resources available in learners' first language are part of the available resources when processing becomes difficult or effortful. As beginner learners, it is expected that learners will rely more on the processing strategies in their Arabic language. This reliance may decrease when it comes to more advanced learners, as they can adopt certain processing properties available from the second language.

First language transfer can be connected to the difficulty Arab learners usually face in the use of English relative clauses (see, for example, Kharma, 1987). Arabic and English relativisation systems are similar. Still, a study conducted by Schacter (1974) found that

Arab learners made more errors than students whose first language (e.g. Chinese, Japanese) is completely different from English in forming relative clauses. Schacter (1974) attributed this difficulty to the fact that the formation of relative clauses in Arabic and English is similar. As a result, Arab learners use their first language strategies in processing English relative clauses. As the target form and all the issues of relevance to processing it are clear, below is a summary of the instruction packets used in the research for the three groups.

### 4.5.3 Instructional packets

The Processing Instruction Group materials were not adopted from any resource. The researcher developed new materials for two reasons. The first was to develop them in a way which suits participants' level of proficiency in the context where the research was carried out. The second reason was that no previous research has used the English relative clauses as the target form. So, there was no resource to get the materials from. Consequently, materials were developed by the researcher, excluding the materials for the Control Group as they were adopted from a BBC learning website.

Instructional packets for the Traditional Instruction Group and Processing Instruction Group were balanced in terms of the time allocated for explanation and practice. So, the explicit instruction was the same. The difference was in the type of practice participants received during treatment in both groups, as it was input-based for the Processing Instruction Group and output-based for the Traditional Instruction Group. Nevertheless, due to the nature of Processing Instruction, the Processing Instruction Group was reminded of problematic strategies which are usually followed by Arab learners in processing English relative clauses.

For the Processing Instruction Group and the Traditional Instruction Group, instruction included the following: explicit instruction, practice (input-based for the Processing Instruction Group and output-based for the Traditional Instruction Group), and feedback.

As for the Control Group, learners did not receive any explicit instruction on English relative clauses. Rather, participants were given different texts that contained relative clauses. The structure was introduced by reading these texts. Then, there was a discussion

of the content of the texts and some questions. Thus, subjects had to deduce the structure and grammatical rules by themselves with no explicit reference from the teacher.

It should be mentioned that in spite of the fact that the lesson plan was in English, Arabic language was used whenever it was necessary to make the lesson more comprehensible. Another point which should be clear from the beginning is that the lesson on relative clauses focused on restrictive types of relative clauses only; learners had a brief explanation of non-defining type of relative clauses, though. Furthermore, as the researcher was working in an academic environment, the focus was on the formal use of relative clauses (the way participants will study English relative clauses in textbooks) only. Nevertheless, learners received a brief explanation of the informal use of relative clauses. For example, it was explained that we can use WHO and THAT instead of WHOM in informal styles; for formal use, we have to use WHOM. A last point to be mentioned is that the focus was on five of the types of relative clauses presented by Keenan and Comrie (1979). There was a reference to the sixth type (object of comparative) with no focus in practice as it is the "only marginal and unacceptable NP function for relativisation", as stated by Celce-Murcia and Larsen-Freeman (1983: 362).

#### 4.5.3.1 Processing Instruction Materials

Following the principles specified in VanPatten (1996) and Lee and VanPatten (2003), three components were included in the instructional materials for the Processing Instruction Group: explicit explanation of the target form, an explicit reminder of the problematic strategies in processing of English relative clauses by Arab learners, and structured input activities.

In this group, participants were never asked to produce the target form. Thus, the start was explicit instruction on relative clauses. This was followed by Structured Input Activities, during which participant were always involved in activities which helped them in processing English relative clauses correctly, giving them the time to internalise this structure. Affective Activities were used to provide learners' intake continually with examples of the correct use of English relative clauses and to enable participants to relate what they learned from the lesson to their own experience, as suggested by VanPatten (1996).

The explicit instruction included the following points:

- Explicit instruction related to relative clauses use where the reasons for using relative clauses were explained in the first lesson.
- This was followed by defining relative clauses and the way we mark relative clauses in Arabic and English (explicit instruction related to relative pronouns, head direction, relative pronouns position).
- Explicit reminder related to Form-Meaning Connection in relation to the use of relative pronouns:
  - Human/non-human (in Arabic the same pronoun is used for both).
  - WHOSE is problematic for Arab learners as it has no equivalent in Arabic. Thus, Arab learners follow their first language strategies and use (who her, who his, which its) instead of WHOSE in forming English relative clauses (Kharma, 1987).

#### 4.5.3.1.1 Structured Input Activities

After the explicit instruction, students were reminded of the above problematic issues in processing English relative clauses. Following this, Structured Input Activities were used. It should be mentioned that due to the peculiarities of Processing Instruction as a type of instruction which does not ask learners to produce the target form, the research was careful to include reading and listening activities only. That is, following the guidelines of VanPatten (1996), no writing or speaking activities were used. These guidelines can be summarised in the following: (1) Teach only one thing at a time; (2) Keep meaning in focus; (3) Learners should do something with the input; (4) Keep the psycholinguistic processing strategies in mind; (5) Move from sentences to connected discourse; and (6) Use both oral and written input.

The first guideline refers to learners' inability to attend to everything in the input. Thus, teaching only one thing at a time can help learners in processing input. These guidelines can be connected to the Availability of Resources Principle mentioned in section (3.4) above. That is, according to the Availability of Resources principle, effortful processing affects learners' ability to process all items in input, especially the redundant or less meaningful ones. Thus, teaching one thing at a time can decrease the pressure on learners' working memory. Thus, in the current research, the researcher divided the problems

learners face in processing English relative clauses so that learners would find it easier to process English relative clauses and to attend to both meaning and form.

According to the second guideline, the Structured Input Activities should always push learners to attend to form and meaning. Thus, "if meaning is absent or if learners do not have to pay attention to meaning to complete the activity, then there is no enhancement of input processing", borrowing VanPatten's words (1996: 68). So, the Structured Input Activities should be designed to help learners in form-meaning connections.

A crucial guideline is the third one, according to which, learners should always do something with the input they receive. Thus, learners are not passive as the Structured Input Activities are learner-centred activities. The Structured Input Activities are designed to capture a problem then work on this problem to facilitate learning. Accordingly, learners are not passive as they are always involved in activities which help them in processing input. For example, Affective Activities are learner-centred where the learner is involved in activities which require them to express opinions.

According to the fourth guideline, psycholinguistic processing strategies should be kept in mind when designing the Structured Input Activities. Each activity with Processing Instruction should treat a problematic strategy which learners usually follow in processing the target grammatical items. These psycholinguistic processing strategies differ from one language to another. For example, the problems which learners (whose L1 is Arabic) face in processing English relative clauses may differ from the ones Japanese learners may face.

The fifth guideline was not adhered to in the current research. According to the fifth guideline, practice should move from sentences to connected discourse. Due to the complexity of relative clauses and learners' level of proficiency in English, the normal class teacher advised to sticking to sentence level only. Thus, the Structured Input Activities were designed to help learners processing English relative clauses by making correct Form-Meaning Connections pushing them away from the erroneous processing strategies.

The last guideline is that learners should be exposed to both oral and written activities. VanPatten (1996) did not provide any explanation on whether these two modes would have

different effects on learners' processing abilities or not. However, VanPatten referred to this guideline from the point of view of the learner as favouring one mode over another.

The explicit instruction, reminder of problematic strategies, and the Structured Input Activities were incorporated to reach the goals of instruction. Below is summary of the Structured Input Activities with examples. For a full list of the activities used, see appendix 11).

The Structured Input Activities used include both Referential and Affective Activities. In spite of the fact that the purpose of these activities is different, as mentioned in section 3.4.2, they were used simultaneously as part of the Structured Input Activities.

Example of Referential Activities:

The following activity was used after explaining the relativisation process

(4.10) Cross out the noun phrase/pronoun which should be substituted by a relative pronoun.

-Then, choose either a, b, c, or d to substitute that noun to be placed in the provided space.

- Write the full sentence in the space provided.

E.g. I know the book which – You mentioned ~~the book~~.

a) to which b) to whom c) which d) for which

I know the book which you mentioned

This is one of the important activities which forced students to process English relative clauses correctly. One of the interesting comments about this activity was by one of the students, who commented that (translated from Arabic) "in this activity we cannot keep any pronouns at the end of the sentence because we delete them in the second sentence before forming the relative clause". What could be understood from this comment is that students were able to do something with the input they received. This comment gives the impression that learners are not passive during the activities.

Example 2 of Referential Activities:

After explaining the problems related to relative clauses in relation to their position in the sentence, students were presented with two activities which were used to help students in processing sentence-medial position items. In one of the referential activities, the relative

pronouns were placed at the beginning of the sentence and students were asked to underline the correct relative pronoun. To choose the correct form, students had to process correctly the sentence by relying on their parsing abilities to identify the function of each item so that they can know which relative pronoun to choose. To do so, students were told that they will be given some sentences starting with "YOUR FRIEND" (the antecedent is the same for all the sentences); then, they were asked to underlie the correct relative pronoun which should be used. Thus, input is manipulated in a way to spare attentional resources by having the relative clause located at the start so that it is the first item seen.

Example 3 of Referential Activities

(4.11) Underline the relative pronoun which should be used to complete the following sentences. The antecedent (head noun) is the same for all the sentences.

Head noun: YOUR FRIEND

E.g. ….. who/<u>whom</u>/whose/which you talked to in the party yesterday is a genius.

Therefore, by answering this activity, students are doing something with the input they received. They were not passive about the instruction they were receiving.

Another activity which was used for the same purpose as the above referential activity was the one below. In this activity, the teacher said the first part of the sentence and students had to choose the correct letter on the answer sheets in order to complete the sentence uttered by the teacher. Again, in this activity students were presented with options where the relative clause is the first item in each option.

For example, the teacher said 'the lesson'. Students had to choose either (a) or (b) as the correct answer to complete the teacher's statement.

(4.12) a) which the teacher gave yesterday was difficult.

b) whom the teacher gave yesterday was difficult.

Again, in relation to sentence location principle, in the students' answer sheets, each answer starts with a relative clause to push learners to process sentence medial position items.

On the other hand, Affective Activities did not require correct/ incorrect answers, as the aim of these was to help learners to relate what they learn to their own opinions. These activities also aimed at providing learners' linguistic system with different examples of the target item.

Example of Affective Activities:

(4.13) Read the following statements. These are some commands in which the speaker used relative clauses. To whom do you expect the command is told?

1. Read the poem which is on page 83.

a) Your neighbour talking to you. B) a teacher talking to students.

2. Give support to people whose houses were affected by the earthquake.

a) a government ordering people. b) a preacher talking to people.

The above activity is not a demanding one. This activity asked participants to show opinions which may differ from one participant to another, but all answers are accepted as there is no right or wrong answer.

Thus, in the Structured Input Activities, the researcher was careful to use tasks which do not ask learners to perform beyond their processing abilities, as the aim is to help processing incoming data, giving time for making Form-Meaning Connections, accommodation and restructuring.

As mentioned above, and depending on previous research (e.g. Kharma, 1976), Arabic plays a crucial role when learners whose L1 is Arabic process English relative clauses for two reasons. Firstly, English relative clauses are a complex structure. Thus, to compensate for the processing deficit when processing relative clauses, learners whose L1 is Arabic resort to principles endowed in their minds. It is for this reason that the researcher reminded participants of these problematic issues with the aim of sparing processing resources.

#### 4.5.3.2 Traditional Instruction materials

According to Paulston (1972), Traditional Instruction includes explicit explanation of the target form with examples to be followed by mechanical and meaningful practice.

Explicit instruction included the following points:

1. Relative pronouns explanation.
2. Explaining the process of relativisation.
3. The importance of using relative clauses.
4. Explaining the different types of relative clauses in English.

Below are some of the activities used in the Traditional Instruction (for the full list of the activities, see appendix 12).

One of the activities asked participants to fill in the gap with the correct relative pronoun. This activity is used to urge learners to use the correct relative pronoun.

(4.14) Fill in the blanks using the correct relative pronouns (who, whom, which, or whose).
*I met the teacher whom you talked with.*
(7 items are used in this activity).

Another activity required students to join two sentences using the prompts provided.
(4.15) Join each pair of sentences below using relative clauses.
I know the book. –You mentioned the book.
I know the book which you mentioned.

Activities used in the Traditional Instruction are output-based as it is claimed by the output hypothesis mentioned in section 3.3.2 that output-based practice would promote learning.

#### 4.5.3.3 Materials for the Control Group

The control group did not receive any explicit instruction on relative clauses. In each lesson, learners were involved in reading a text (a different topic in each text). Then, they were involved in activities related to the text (see appendix 16 for the instruction materials).

The topic of the first lesson was “smoking ban” (the text was from a BBC learning English website, excluding day 3 topic which was adopted from The New Headway series). The lesson started by introducing the topic by means of asking students about healthy habits. This was followed by introducing the new vocabulary, where learners wrote sentences which include the new vocabulary. Subsequently, learners read the text and answered the questions related to the text.

The second day started by introducing the topic of the lesson “Seven World Wonders” (the text was from the BBC website). Then, new vocabulary was introduced and learners had to guess the meaning with the teacher giving the correct meaning for each item. This was followed by silent reading of the text. Afterwards, students were involved in questions about the text. At the end, learners were told to write a short paragraph about a place they liked to visit.

Finally, the topic of the third day was related to John Travolta’s lifestyle (adopted from The New Headway). Firstly, learners were involved in a matching activity to introduce them to new vocabularies. Then, learners read the text and tried to fill the blanks in the text. This was followed by some questions related to the text. In spite of the fact that learners did not receive any explicit instruction on relative clauses, learners read examples of relative clauses in the texts they read in the lessons.

The total time allocated for the treatments in the current research was roughly 6.45 hours. Each group received 2.15 hours during three consecutive days (45 minutes every day). Of course, research is usually not evaluated depending on the length of field-work; rather, focus is usually on the validity of the research design and reliability and utility of the results. This is confirmed by Norris and Ortega (2000), who stated that the duration of instruction in research does not affect the utility of effects to be found.

### 4.6 Data collection methods

#### 4.6.1 Assessment tasks

To evaluate the effects of instruction on learners’ developing system, three tests were designed: a pre-test, a direct post-test, and a delayed post-test (see appendix 13, 14, 15, respectively). As for the nature of these tests, they were designed in a way to evaluate learners’ progress after instruction. It is of importance that the assessment be balanced with

no bias towards one treatment over another. Accordingly, following VanPatten and Cadierno's study (1993), assessment in the present research is balanced by having activities which were used during the treatments. The comprehension tests were based on the referential activities which the Processing Instruction Group received during instruction. As for the production tests, they were based on the output-based activities which the Traditional Instruction Group received during instruction.

To evaluate the effects of instruction on learners' developing system, three tests were designed: a pre-test, a direct post-test, and a delayed post-test. These tests were designed to evaluate learners' progress after instruction so that changes to their interlanguage system could be measured with the results of the pre-test.

The pre-test included two comprehension tests and two production tests. The comprehension tests contained ten sentences and learners had to display understanding of the different usage of English relative pronouns. The second test was a production test which required learners to join two sentences using the correct relative pronouns. Secondly, the direct post-test also contained two tests, as the above ones. The first is a comprehension test which required students to identify the noun phrase which should be substituted by relative pronouns, and then to choose the relative pronouns suitable for the substitution. As for the production test, students had to complete sentences using prompts provided by the teacher. Finally, the delayed post-test was designed in a similar way to the previous tests, as the first test was a comprehension test which required students to decide on the type of relative clauses. As for the production test, it required students to complete sentences using relative clauses.

The normal class teacher recommended using short tests for assessment due to learners' level of proficiency, as long tests can distract students and they may get bored. Thus, 20 items were used for assessment, 10 items in the comprehension section, and 10 in the production section.

A last point to be mentioned in relation to assessment is that two versions of assessment were used. That is, to avoid the effects of memorising the items used in the tests, two versions were used. The first version was used in the pre-test and the direct post-test, and the second version was used in the delayed post-test. Due to the fact that learners were not

aware of the targeted structure in the pre-test and their responses showed no knowledge of relative clauses, the same version was used in the direct post-test. As for the delayed post-test, the same type of test was used, but with different items. At the same time, to avoid the criticism related to comparability (Mackey and Gass, 2005), the two versions were different, so a compromise was to have the same assessment with different items, but without changing the nature of the tests, as different tests can lead to different performance depending on the difficulty of the test.

### 4.6.2 Feedback questionnaire

A questionnaire was given to participants in the Processing Instruction Group only. The purpose of the questionnaire was to get feedback from participants in relation to their impression towards the Processing Instruction treatment they received in comparison with instruction they are used to. This kind of information helped and supported the general results in the research as it helped in understanding students' reaction to this model, as will be made evident in section (5.5.1).

### 4.6.3 Ethnographic data

Ethnography could be seen as "an approach to social research based on the first-hand experience of social action within a discrete location, in which the objective is to collect data which will convey the subjective reality of the lived experience of those who inhabit that location", borrowing Pole and Morrison's words (2003: 16). Thus, away from the presuppositions a researcher may have about the context of the study, field-work observation and note-taking may change these suppositions, as the researcher is recording things as they occur in the actual settings.

In the current research, colleting ethnographic data was supposed to be in the form of recording classes and keeping a diary. However, due to participants' concerns that their personalities could be identified, the principal did not give permission for the recording (see appendix 5 and 6 for a translated version). In spite of the fact that the principal and the students signed the consent form in which they agreed to the recordings, it seems that when it came to actual classes, students did not feel comfortable for their voices to be recorded. So, the ethnographic data was mainly through taking notes (see section 5.6).

Collecting ethnographic data was of importance in the current research. The main source of data is numeric (students' achievement in the consecutive tests). Numeric data may not reflect "the subjective reality of the lived experience of those who inhabit 'educational' locations", borrowing Pole and Morrison's words (2003: 17). So, due the importance context can have on the results, ethnographic data is collected in the form of note-taking.

### 4.7 Piloting and the actual experiment

Materials in the actual experiment were piloted before being adopted as a final version for the actual experiment. Eighteen participants (tenth grade) took part in the piloting of the teaching materials. A teacher of English also checked the appropriateness of the materials for learners' level of proficiency (the teacher was a teacher of tenth grade, but not in the participating school).

One of the adjustments made as a result of the piloting was related to changing some activities and deleting others. Another was to decrease the number of items in the activities due to the time limit of the classes (45 minutes each class). The following points summarise modifications related to activities.

#### 4.7.1 Activities

Piloting the activities showed that some of the activities should be cancelled and others changed for different reasons.

- **Processing Instruction Group**

One of the activities was excluded as it was found that it is more professionally-oriented and it is not usually given to secondary school students in Syria (see appendix 18 which includes the activity).

- **Traditional Instruction Group**

Firstly, one of the activities, which asked students to listen to the teacher saying Arabic statements and participants had to translate what they heard using relative clauses, was unworkable, as students' level of proficiency did not allow them to do the task. Thus, this activity was changed to asking students to listen to the teacher saying incomplete sentences and then, students were asked to complete the sentences.

### 4.7.2 Questionnaire

The first point to be mentioned is that students were unable to answer any questions on the questionnaire till the researcher explained and translated the questions one by one. However, the researcher did not translate the questionnaire into the Arabic language as the researcher was in the classroom to explain all the questions to students.

## 4.8 Actual Experiment

### 4.8.1 Permission and preparation

One of the difficult points in the actual experiment was getting permission to get into the school. That could have been the result of the fact that normal classes had to be stopped for the experiment to take place (full lessons were needed for the three treatments). Thus, permission was for the main treatment and tests only (total was 18 classes). So, no extra classes were permitted to teach the successful treatment to the other two groups that did not receive it as this may have affected the progress of normal classes.

There were four classes (groups) in the tenth grade at the school where the research was carried out. The number of students in each class ranged between 25 and 30. The principal did not recommend changing learners' classes, as this would have consumed time and might have created difficulty for the students in getting used to their new peers. Moreover, the principal stressed the fact that students were allocated to these four classes randomly at the beginning of term. Thus, all students remained in their normal classes with no change. As three groups were needed for the research (Processing Instruction Group, Traditional Instruction Group, and a No-instruction Group), the researcher chose classes section 1, 2, and 3, excluding section 4.

One of the concerns while designing the materials was regarding students' motivation, as this could have affected the research. This concern vanished the first day the researcher met the students, as the endless questions they asked were all an indication of students' intelligence and interest in learning and education.

### 4.8.2 Intervention and assessment

The instruction was delivered by the researcher with no interference on the part of the normal class teacher, who was, however, happy to join some of the classes. As stated above, the researcher developed the materials as they were not available from previous

research. In addition to the instruction materials and activities, the researcher also gave learners handouts during instruction; these contained English relative pronouns with examples and also a summary of the process of relativisation with examples**.** However, the researcher decided to collect these handouts at the end of each lesson and not to leave them with learners to avoid any extraneous variable that could have affected the research, especially during the period between the direct post-test and the delayed post-test. Events during the experiment with focus on the ethnographic data will be presented and discussed in chapter 6.

The final point of relevance to be mentioned is related to the interval between the direct post-test and the delayed test. Students did not have any work related to relative clauses or any review of English relative clauses, as this was supposed to be done in term two of the year 2009.

A pre-test was conducted one day before instruction. Instruction lasted for three days (45 minutes every day). A direct post-test was answered by students the day after the end of intervention. The questionnaire was also completed by students in the Processing Instruction Group in the same day. The delayed post-test was conducted four weeks after instruction (see Table 4.2 for a summary of the experiment).

**4.9 Summary**

For the researcher, the writing and work for this chapter was a demanding process. Research procedures do not work the way a researcher wants, as there are always many unexpected issues that can arise and cause problems. Thus, in spite of the fact that the researcher has her plan of how the field-work will proceed, many unexpected issues happened. For example, difficulty in getting permission was not expected. The behaviour of participants in the Control Group was also not expected. That is to say, talking about equal opportunities in a theoretical way is completely different from facing it in a real situation with learners who are so curious to learn, but because they are in a control group, they will not get the benefit the other groups would receive. Thus, for the researcher, experimental designs should consider alternatives to control groups.

Another problematic area for the researcher was not the design of the research as much as being convincing in presenting it. As no one can change others' intellectual foundations, as

mentioned in section (4.2), the researcher has to convince the reader of her views in relation to why she used experimental design, and how she tried to address the problematic issues (variables which can be a threat to the research validity).

Thus, although an exhausting process, the study design and data collection methods chapter tried to address the methodological issues which are usually criticised in experimental designs in education research, especially the ones related to ethical concerns as mentioned above.

# Chapter Five: Data analysis

## 5.1 Introduction

This section focuses on the techniques used in the analysis of data. In the current research, three methods for data collection were employed. The main source of data makes use of individual students' scores provided as numeric entities at each of the three test-designs (pre-test, direct post-test, delayed post-test), as the aim is to test the effects of different instructional treatments on students' linguistic system after treatment in comparison with students' performance in the pre-test. In addition to these numerical data, the second method involved a questionnaire which was answered by each student in the Processing Instruction Group to elicit their attitudes and perceptions of Processing Instruction. The third data collection method consisted of field-notes. Ethnographic data was collected with the aim of documenting accompanying events inside and outside the classroom in order to provide contextual details that would help in interpreting the results.

The chapter will proceed as follows: the first section will sketch out Statistical Research Design and Analysis. The following section focuses on the statistics used in Education Research. Section 5.4 describes the assumptions of parametric tests. Section 5.5 presents the analysis of the data from the current research. Section 5.6 focuses on students' attitudes and perception of Processing Instruction. The subsequent section sheds light on the ethnographic data which was collected during the experiment, ending the chapter with a summary in section 5.8.

## 5.2 Statiscal Research Designs and Analysis

### 5.2.1 Statistics and Research Designs

As stated in section (4.3.1), research designs vary, and the choice of one depends on the notion of 'fitness of purpose' (Cohen et al. 2007: 78). Statistics used in experimental research usually affect the research design. For example, in the current research, the purpose was to test the effects of two instructional treatments on learners' linguistic system. So, it was necessary to test students' knowledge before and after instruction. This entails that we have two experimental groups and a control group which were tested before and after instruction.

The current research set up can be summarised as follows: three separate groups (randomly assigned to each method of instruction) were involved, as there were three different instructional treatments (Processing Instruction, Traditional Instruction, and a Control Group). As mentioned in the methodology and study design chapter, assessment was carried out by two consecutive tests. These tests were designed to evaluate learners' comprehension and production of English relative clauses so that changes to their linguistic system could be measured with the results of the pre-test. Following VanPatten and Cadierno (1993), assessment items were balanced by having two tests from the activities used in the Processing Instruction Group during the treatment and two tests adopted from the activities used in the Traditional Instruction Group during treatment.

For the kind of data being collected, repeated measures analysis of variance (ANOVA henceforth) would be the most suitable test to be used for data analysis because the pre-test and the post-test experiments were administered to the same individuals. ANOVA tests the null hypothesis that there are no significant differences between the groups being compared in terms of their mean values (see, for example, Field, 2009 for a full discussion of parametric/ non-parametric tests). So, the results of ANOVA would either come to confirm the null hypothesis or to reject it, and say that it is found that there are significant differences between the groups being compared. ANOVA just shows whether there are significant differences between the groups or not. In the case where ANOVA rejects the null hypothesis, one must proceed to the Post Hoc tests which show details related to whether the significant differences exist between the three groups or only between two groups.

By using ANOVA, two independent variables are present (instruction and time), and one dependent variable (scores). The difference between dependent variables and independent variables is that the first is being affected by the second as the second in usually called factor (in reference to the effects of this factor on the dependent variables). For example, in the kind of data in the current study, there was only one dependent variable (students' scores from the consecutive tests: pre-test, direct post-test, and delayed post-test) and two independent variables (method of instruction and time).

### 5.2.2 Statistical Analysis

Strictly speaking, there are no universal techniques for data analysis. Rather, the technique to be used in any research depends on the type of data available, environmental constraints induced by the design of the experiment and goals of the data analysis. For instance, while a statistical approach can be adopted when numerical data are available, a non-conventional based method might be called upon in case of qualitative data or entities, although some statistical tests apply for non-numeric entities defined on nominal scale.

In the case of numeric data, which corresponds to our current research, the choice of a specific statistical test depended on the aims of the research and the kind of data collected. This includes, for instance, comparing means, finding correlation, showing associations between independent variables and so on. However, the use of a specific statistical test is not always straightforward as most statistical tests do have their own prerequisites, beyond which the use of the test may not be recommended. More specifically, one can distinguish two classes of statistical tests: parametric statistical tests (e.g., the tests used in the analysis of data in the current research) and non-parametric statistical tests. The difference between these two kinds of tests is that parametric tests assume data are sampled from some (parametric) probability distribution while such an assumption is not present in the case of non-parametric tests. Thus, in the case of parametric tests, there are certain assumptions which usually underlie the use of these parametric tests (e.g. normality of distribution and homogeneity of variances). As for non-parametric tests, there are no such assumptions to confine their uses. Another difference between parametric and non-parametric tests is that the first is used to compare means and the second are usually used for nominal and ordinal data, as Seliger and Shohamy state (1989: 203).

However, whenever possible, it is often stated that, due to its powerfulness, the use of a parametric test is usually more recommended. Siegel and Castellan (1988:36) stated that if "the research hypothesis could be tested with a parametric test, then non-parametric statistical tests are wasteful". In other words, when it is possible to use a parametric test, non-parametric tests are not recommended as they are not powerful the way parametric tests are especially with numeric data.

As already pointed out, in the current research, the inputs were numerical entities, since students' scores in the three tests were defined on cardinal scale, and the aim was to compare means to find out significant differences between groups before and after

treatment. Thus, a parametric test was used to compare students' progress after intervention in the two consecutive tests in comparison with the results of the pre-test before the intervention.

In addition to the above mentioned points, some have argued that the statistical significance in the aforementioned tests is not useful, recommending Effect Size calculations as an alternative (e.g. Kirk, 1996; Schmidt, 1992). Effect Size computations measure the magnitude of interventions within and between, for example, three different groups. The American Psychological Association has recommended the use of 'effect-size information' as this kind of measure is not dependent on the sample size (1994: 18). Thus, in the current research due to the limitations of statistical significance, the researcher used Effect Size calculations to support data analysis.

More specifically, Effect Size will be reported to estimate the effect of intervention (Processing Instruction, Traditional Instruction and No instruction) on participants' performance in the consecutive tests. Effect size calculations offer the opportunity of estimating the effects of an intervention objectively (e.g. Ellis, 2000). Effect size can estimate both between and within groups. That is, effect size shows the magnitude of intervention within groups from the pre-test to the direct post-test/ pre-test to the delayed post-test, and between groups between Processing Instruction and Traditional Instruction/ Traditional Instruction and No-Instruction/ Processing Instruction and No-Instruction. A good point in effect size calculations is that it does not have any underlying assumptions and can be applied to any data regardless of the shape of the data and can offer trusted objective results.

The above introductory section introduced the kind of data available from the current research and the tests to be used for analysis. The rest of this chapter will proceed as follows: The first section will focus on presenting an overview of the statistics used in education research. The second section will discuss the options available to researchers when the assumptions of parametric tests are violated. The focus in the third section is on data from the present research focussing on the scoring procedures and testing the assumptions ending the section by reporting the results from the ANOVA test, and the results of the Effect Size computations. The last section in the chapter moves from numeric data to participants' views and feedback depending on their reposes to the questionnaire.

This will be followed by an overview of participants' behaviour during the treatments ending the chapter with the problematic issues of relevance to the Control Group.

### 5.3 Statistics used in Education Research

Most of the studies in education research used parametric tests to analyse data. This was confirmed by Lazaraton (2000) who analysed 332 empirical research articles in four applied linguistics journals between 1991 and 1997 (*Language Learning, The Modern Language Journal, Studies in Second Language Acquisition, and TESOL Quarterly)* and found that parametric tests were used more than non-parametric tests. However, parametric tests used in education research are usually used with no or incomplete reference to the assumptions which underlie the use of such parametric tests (e.g. ANOVA).

In this regard, Lazaraton states that "it is likely that the majority of studies that used ANOVA did so in violation of at least some of these assumptions" (2000: 178). The important point to be mentioned is that most of the research investigated by Lazaraton (2000) used parametric tests as they give more powerful results than the ones we get from non-parametric tests. Another important point is that previous research in education has ignored the assumptions of parametric tests, and they used these tests with no reference to the assumptions which underly their use (whether the assumptions were validated or not).

Statistical tests used in the above mentioned journals are summarised by Lazaraton (2000) as follows:

- ANOVA accounted for over 40% of the statistics used in those journal articles.
- Pearson correlation (26% of the articles)
- T test (23%),
- Regression analysis (13%),
- Chi-square (12%).
- MANOVA 7%
- ANCOVA 7%
- Factor analysis 6%

This list gives an indication to the fact that researchers in education research used parametric tests for analysis, even when the data did not meet the assumptions of the

parametric tests which were used. This could be a result of the well-established assumption that parametric tests are quite robust to violations of normality and homogeneity.

Limitations of the statistics used in previous education research were also overviewed by Norris and Ortega (2000). According to the analysis of 250 studies in education research, Norris and Ortega found that only 49 studies reported enough statistical data. This kind of review of previous statistics used in education research is of importance, as it can help in solving some problematic issues in data analysis and suggesting alternatives for others. For example, Norris and Ortega suggested that researcher can report Effect Size to measure effects of treatments instead of the absolute dependence on the statistical significance.

In other words, using these statistical tests without referencing their associated assumptions could make the outcomes of such research very debatable. That is, even if one wants to proceed with the chosen parametric test, the assumptions should be tested and, possibly, violations laid bare and discussed. Besides, a more important point is that other calculations and tests can be used side by side with the parametric tests so that results can be more trusted. For examples, reporting Effect Size is seen as an objective powerful measure for the effects of treatments. Thus, it would be of importance for future research to give more details about the test to be used for analysis. Importantly, some of the violations could be managed by the Statistical Package for Social Sciences 18 (SPSS 18, henceforth) programme (e.g. choosing Games-Howell post Hoc test which does not assume equal variances instead of the ones which assume equal variances/homogeneity of variances).

The above section outlined the way statistics was used in education research, and the way researchers, in education, dealt with these assumptions. The following section introduces the effects of violating the assumptions of parametric tests with reference to the way a researcher can manage these assumptions.

### 5.4 Managing the Assumptions of Parametric Tests

Below is a reference to the effects of violating the assumptions of parametric tests on the reliability of the ANOVA test.

### 5.4.1 Normality distribution and homogeneity of variance

It has been pointed out in statistics that the F-statistics (the name was coined by George W Snedecor in honour of Ronald A. Fisher (1920s) who developed such statistics and rather used the name of variance ratio) used in ANOVA is quite robust for small deviations from normality and homogeneity of variances (see, for example, Lindman (1974) for a detailed argument on this issue). One of the important studies to be mentioned in this context is the one by Lunney (1970) who used ANOVA with the most non-normal data and found that when groups/sample sizes are equal, ANOVA is quite reliable and accurate.

### 5.4.2Independence of variables

This assumption is part of experiment design. It is usually achieved by assigning participants randomly to groups. Besides, it is usually not violated when participants in a specific group will not take part in any of the other groups. Violation of this assumption is not tolerable as results are not reliable in this case.

### 5.4.3 Sphericity Assumption

The Sphericity assumption can be tested by the Mauchly's test of Sphericity (Munro, 2001). If the assumption is met, the researcher will report the results as being univariate. Otherwise, the results could be reported as either univariate or multivariate (Munro, 2000). So, even if the Sphericity assumption is not met, one still can proceed with ANOVA as Sphericity is "a sufficient condition for conducting ANOVA on repeated measures data" but "not a necessary condition", as stated by Field (1998: 14).

Depending on the above points, it could be said that even if the normality distribution assumption is not met, it seems from previous research that parametric tests are usually quite robust to small deviations. Seliger and Shohamy stated that "with the exception of independence, some violation of one or more of these assumptions is not crucial" (1989: 204). What is meant by independence (one of the assumptions of parametric tests) is that the groups are not mutually exclusive. In other words, the choice of one participant will not affect the other and this is of course not a problem in any research when participants are randomly assigned to groups.

### 5.4.4 What a researcher should do when the assumptions are violated?

The question now is what should a researcher do when any of the assumptions is violated? This question could be a problem as a researcher can do nothing before, during, or after the data collection stage to control the assumptions of parametric tests. That is, the researcher can do nothing to affect the data to meet the assumptions of parametric tests. Thus, it is not necessary for a researcher to change the research questions and move to a non-parametric test (if the assumptions of parametric tests are violated) especially if the data is meant to be analysed using a parametric test (the case of the current research).

An answer to the above question important question is presented by Pallant (2007). Pallant (2007) suggested the following options:

- The first option is to rely on the robustness of parametric tests and continue with the chosen test.
- The second option is to transform the data to become normally distributed.
- The third option is to use the non-parametric test which counters the parametric one.

It could be said that the first option is the one which is most recommended. For example, Glass, Peckham, and Sanders (1972) pointed out that parametric tests are quite robust to violations of normality and homogeneity.

The second option is usually not recommended as it was argued that “the payoff of normalizing transformations in terms of more valid probability statements is low, and they are seldom considered to be worth the effort”, as Glass, Peckham, and Sanders stated (1972: 241).

The last option related to the use of non-parametric tests may not be a good substitution as non-parametric tests are not recommended to be used “for rejecting the null hypothesis at a given level of significance”, borrowing Seliger and Shohamy words (1989: 203). This could be a result of the fact that non-parametric tests are based on ranks rather than actual scores (means) and it is not possible to give an accurate account of the significant differences between groups by relying on the number which comes in the middle of a range of numbers. In other words, when non-parametric tests are used, data are usually arranged in an ascending order. Then, data will be labelled depending on the rank they

belong to. For example, the highest score the label 1, the next will be given the label 2, the lowest score will be given the label 3 and so on. Non-parametric tests are best suited when the data to be analysed is nominal (e.g. sex: male= 1, female= 2/ level of proficiency in English: advanced= 1, Intermediate= 2, Beginner= 3) or ordinal (e.g. large= A, medium= B, small= C). As for ratio and interval variables (e.g. students' scores 50, 70, 90 …etc), they must be analysed using a parametric test to get a reliable and powerful results.

Of course, data from the current study are interval as they present students' scores in the tests before and after instruction. Thus, a parametric test was expected to be useful to find the significant differences between group means before and after treatment.

As the assumptions of parametric tests and the way previous research dealt with these assumptions are explained above, focus below is on exploring the data from the current research. More precisely, there will an exploration of the conformity of the data available from the research to the above mentioned assumptions. A point to be mentioned in this regard is that to the researcher's knowledge, no previous study on Processing Instruction checked the conformity of data when it comes to the assumptions of parametric tests. Most of previous research on Processing Instruction, if not all, used solely the ANOVA test with no reference to whether the assumptions are validated or violated.

## 5.5 Data from the Current Study

### 5.5.1 Tests and scoring procedures

As mentioned above, three tests were performed to collect data before and after instruction. The pre-test test was given to participants one day before instruction. Instruction lasted for three consecutive days (45 minutes each day for each group). The immediate post-test was given the day after instruction. As for the delayed post-test, it was given to students four weeks after the immediate post-test. The purpose of the delayed post-test was to judge whether the results of instruction were retained over time or not.

The comprehension section of the pre-test, the direct post-test and the delayed post-test for the three groups involved two parts where students could be assigned a score of up to five marks for each part. Similarly, the production section of the pre-test, the direct post-test and the delayed post-test for the three groups involved two parts where up to a total of five marks could be assigned to each individual. This yielded a total of 20 points (10 points for

the comprehension section and 10 points for the production section) as highlighted in Table 5.1 below.

Table 5.1 Summary of marks distribution for comprehension and production sections

| | Pre-test | | Direct Post-test | | Delayed Post-test | |
|---|---|---|---|---|---|---|
| Comprehension Sections | 5 points | 5 points | 5 points | 5 points | 5 points | 5 points |
| Production Sections | 5 points | 5 points | 5 points | 5 points | 5 points | 5 points |
| Total | 20 points | | 20 points | | 20 points | |

Raw scores were counted by giving one mark for each correct answer and a zero for each incorrect answer in both comprehension and production tests. Thus, there was no partial-credit for partially correct responses as the correction was based on the right-wrong scoring method (Purpura, 2004).

Spelling mistakes and grammar mistakes relating to verb tenses did not affect scoring as the focus was on the correct use of relative clauses (focus in scoring was on the correct use of relative pronouns, avoiding the use of resumptive pronouns, and correct formation of relative clauses). Thus, at the end of scoring, data were sorted in the following manner to be analysed statistically using SPSS 18:

- Comprehension data (scores) from the pre-test for the three groups (the Processing Instruction Group, the Traditional Instruction Group, and the Control Group).
- Production scores from the pre-test for the three Groups (the Processing Instruction Group, the Traditional Instruction Group, and the Control Group).
- Comprehension scores from the direct post-test for the three groups (the Processing Instruction Group, the Traditional Instruction Group, and the Control Group).
- Production scores from the direct post-test for the three aforementioned groups.
- Comprehension scores from the delayed post-test for the above three groups.
- Production scores from the delayed post-test for the aforementioned three groups.

As the tests and the scoring procedures are clear now, in the following section, data will be explored to find out if the assumption of ANOVA are met or not.

### 5.5.2 Comprehension and Production Data

As stated earlier, for the kind of data available from the current study, Repeated Measure ANOVA statistical test was the most suitable test to be used for data analysis. Given the description of the experiment setup, there were two independent variables: the treatment group with three levels (Processing Instruction, Traditional Instruction, and a Control Group), and time with three levels (pre-test, direct post-test and delayed post-test). The only dependent variable present in the study was the scores.

The repeated measure ANOVA enables us to answer the following questions:

- Do the three groups (Processing Instruction, Traditional Instruction, and a Control Group) have significantly different scores in the comprehensive/ production tests?
- Are there significant differences in scores across the three time periods (within the same groups and between the different groups)?
- Is there an interaction between instruction and time?

However, to be able to use this test, there are certain assumptions which should be considered first. These assumptions can be summarised in the following:

1. The dependent variable should be normally distributed within groups.
2. Homogeneity of variance (it is assumed that the variances in the different groups of the design are identical).
3. Independence assumption.
4. Sphericity assumption which tests whether the variances across the measurements are equal. This can be tested using Mauchly's test of Sphericity (Munro, 2001).

### 5.5.3 Testing the Assumptions of Parametric Tests

#### 5.5.3.1 Normality of Variance (comprehension and production)

We adopt the common observation that, in case of normally distributed variable:

- 68% of the observations lie within one standard deviation of the mean, i.e., belong to interval [mean-$\sigma$, mean+$\sigma$]

- 95% of the observations lie within two standard deviation of the mean, i.e., belong to interval [mean-2σ, mean+2σ]
- 99.7% of the observations lie within three standard deviation of the mean, i.e., belong to interval [mean-3σ, mean+3σ]

Table 5.2 below provides a summary of the above analysis. It should be noted that the pre-test data are relatively poor in terms of information as scores were so low and mainly close to zero. Therefore, the test for normality is meaningless for pre-test data as participants showed no knowledge of relative clauses.

Table 5.2: Analysis of normality (comprehension)

| Data (Comprehension) | W-1-sigma (%) | W-2 sigma (%) | W-3-sigma (%) |
|---|---|---|---|
| Group 1(PI) Pre-test | 54.5455 | 90.9091 | 100 |
| Group 1(PI) Direct Post-Test | 81.8182 | 100.0000 | 100 |
| Group 1(PI) Delayed Post-Test | 81.8182 | 86.3636 | 100 |
| Group 2(TI) Pre-test | 81.8182 | 100.0000 | 100 |
| Group 2(TI) Direct Post-Test | 68.1818 | 95.4545 | 100 |
| Group 2(TI) Delayed Post-Test | 50.0000 | 100.0000 | 100 |
| Group 3(CG) Pre-test | 45.4545 | 90.9091 | 100 |
| Group 3(CG) Direct Post-Test | 68.1818 | 100.0000 | 100 |
| Group 3(CG) Delayed Post-Test | 59.0909 | 100.0000 | 100 |

As it is clear from the above table, violation of normality is not severe as all the data fall within three standard deviations. Violation is restricted to the groups' poor results in the pre-test and the results of the control group in the pre-test and the delayed post-test. This observation is also reinforced by the Shapiro-Wilk and Kolmogrov-Smirnov tests shown in Table 5.4. Similarly, according to Shapiro-Wilk test, if one accepts a risk of 2% of reducing the null hypothesis, or an alpha level of 0.02, then all post-test results (direct and delayed post-tests for all groups) accommodate the normality assumption. Table 5.3 below shows the results of analysing production data for normality:

Table 5.3 Analysis of normality (production)

| Data (Production) | W-1-sigma (%) | W-2 sigma (%) | W-3-sigma (%) |
|---|---|---|---|
| Group 1(PI) Pre-test | 95.4545 | 95.4545 | 95.4545 |
| Group 1(PI) Direct Post-Test | 40.9091 | 100.0000 | 100.0000 |
| Group 1(PI) Delayed Post-Test | 72.7273 | 100.0000 | 100.0000 |
| Group 2(TI) Pre-test | 95.4545 | 95.4545 | 95.4545 |
| Group 2(TI) Direct Post-Test | 63.6364 | 100.0000 | 100.0000 |
| Group 2(TI) Delayed Post-Test | 68.1818 | 95.4545 | 100.0000 |
| Group 3(CG) Pre-test | 90.9091 | 90.9091 | 90.9091 |
| Group 3(CG) Direct Post-Test | 86.3636 | 95.4545 | 95.4545 |
| Group 3(CG) Delayed Post-Test | 86.3636 | 95.4545 | 95.4545 |

In the view of the above results shown in previous tables, the normality assumption can intuitively be motivated and one can rely on the robustness of parametric tests.

In addition to the above analysis, The Kolmogorov-Smirnov is used in Table 5.4 below to check the normality of the data using SPSS program. The Kolmogorov-Smirnov assesses the null hypothesis (the distribution of data is normal). If the p value is more than .05, this means that the data are normally distributed. However, if the p value is less than .05, this indicates that the data is not normally distributed.

Table 5.4 Shapiro-Wilk and Kolmogrov-Smirnov tests

**Tests of Normality**

| Test | Instruction | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Test1C | CG | .273 | 22 | .000 | .835 | 22 | .002 |
| | PI | .314 | 22 | .000 | .828 | 22 | .001 |
| | TI | .170 | 22 | .096 | .924 | 22 | .092 |
| Test2C | CG | .244 | 22 | .001 | .883 | 22 | .014 |
| | PI | .428 | 22 | .000 | .575 | 22 | .000 |
| | TI | .164 | 22 | .129 | .944 | 22 | .238 |
| Test3C | CG | .202 | 22 | .020 | .920 | 22 | .077 |
| | PI | .288 | 22 | .000 | .714 | 22 | .000 |
| | TI | .170 | 22 | .096 | .903 | 22 | .035 |
| Test1P | CG | .539 | 22 | .000 | .221 | 22 | .000 |
| | PI | .539 | 22 | .000 | .221 | 22 | .000 |
| | TI | .539 | 22 | .000 | .221 | 22 | .000 |
| Test2P | CG | .524 | 22 | .000 | .333 | 22 | .000 |
| | PI | .174 | 22 | .084 | .885 | 22 | .015 |
| | TI | .164 | 22 | .127 | .916 | 22 | .063 |
| Test3P | CG | .505 | 22 | .000 | .423 | 22 | .000 |
| | PI | .153 | 22 | .200* | .940 | 22 | .194 |
| | TI | .192 | 22 | .034 | .922 | 22 | .084 |

### 5.5.3.2 Test of homogeneity of variance

Levene's test is used to examine whether the variances in the groups are equal or not. This is a test of the null hypothesis that at a given stage, the groups drawn from normal distributions have the same variance, against the alternative that they are drawn from normal distributions, but with different variances. Running SPSS to test the homogeneity of variances showed that some of the variances met the assumption but not others. Table 5.5 below shows results of Levene's statistical test of homogeneity of variance. This tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Table 5.5 Levene's Test of Equality of Error Variances

| | F | df1 | df2 | Sig. |
|---|---|---|---|---|
| Test1C | 1.498 | 2 | 63 | .231 |
| Test2C | 1.677 | 2 | 63 | .195 |
| Test3C | 18.219 | 2 | 63 | .000 |
| Test1P | .000 | 2 | 63 | 1.000 |
| Test2P | 29.838 | 2 | 63 | .000 |
| Test3P | 29.333 | 2 | 63 | .000 |

As it can be noticed from the above table, the assumption that the three groups follow a normal distribution with the same variance can be justified for some tests but not for others. More formally, the homogeneity of variance assumption is valid for the pre-test (comprehension, $p > .05$), direct post-test (comprehension $p > .05$), and the pre-test (production, $p > .05$). As for the other tests, the significant value shows that the error variance between groups is not equal ($p < .05$).

At this stage a few conclusions can be drawn:

- The fact that it has been demonstrated that the assumption of equal variance cannot be validated, one may straightforwardly conclude that the groups are distinct as they cannot be statistically equivalent regardless of the mean values, which explicitly show great variation.
- Another issue which has not been explored is to transform the data into normally distributed data. This requires more exploratory analysis, as few tests of usual transformations, like log or inverse log do not seem to provide sufficient results in terms of homogeneity of variance. Transforming data is not recommended as was clear from the discussion in the previous section.
- Alternatively, one can rely on the robustness of ANOVA when the homogeneity assumption is violated as pointed out earlier and continue the testing. Importantly, SPSS programme provides different options in case the homogeneity assumption is not met (tests which assume homogeneity and those which do not are present in SPSS). Thus, to avoid any inaccuracy, in the analysis of data from the current research, in the Post Hoc test, the Games-Howell test (does not assume homogeneity of variance) and the Tukey test (assumes homogeneity of variance) will be used.

#### 5.5.3.3 Test of Sphericity

This also refers partly to compound symmetry which tests the uniformity of the correlation. Strictly speaking, the compound symmetry assumption requires that the variances (pooled within-group) and covariances (across subjects) of the different repeated measures are homogeneous (identical). This is a sufficient condition for the univariate *F* test for repeated measures to be valid: it states that the *within-subject* "model" consists of independent (orthogonal) components. However, it is not a *necessary* condition as was clear from the discussion in the above sections. For the purpose of testing the Spherical assumption, Barlett statistical test will be used. Barlett statistical test showed that the Sphericity assumptions is not validated as the P is less than .05 (p= .00). Field (1998) stated that the Sphericity assumption is not necessary for the Repeated Measure ANOVA.

As it is clear from the analysis above, it can be said that the assumptions of ANOVA were not validated. However, the researcher proceeded with the chosen test (ANOVA). This decision was based on the above discussion related to statistics used in Education research, and also on the choices presented by Pallant (2007) above. Thus, as, parametric tests (ANOVA in the case of the current research) are the main tests used in education research, as highlighted in a study by Lazaraton (2000), and as it was proven in previous research that parametric tests are robust to small deviations from normality and homogeneity, the researcher decided to proceed with the chosen test. Of course, this can be a limitation of the use of ANOVA. It is for this reason the researcher also used Effect size calculations for the analysis to be more robust and reliable.

### 5.5.4 Why Effect Size of Interventions

Some have criticised the statistical significance as being not fully useful, recommending Effect Size as an alternative (Hunter, 1997; Kirk, 1996; The American Psychological Association, 1994; Schmidt, 1992; Thompson, 1999). As an advocate of reporting the Effect Size, Thomson went as far as recommending that researchers should be required rather than encouraged to report Effect Size. Similarly, Norris and Ortega (2000) also encouraged researchers to use Effect Size calculations to estimate the effects of instructional treatments. Importantly, there are no assumptions or pre-requisites for the use of Effect size calculations as they are applicable to any data regardless of the sample size.

Rosenthal (1994) recommended the use of d-type effect size estimates to compare the effects of two independent variables. So, effect size calculations in the current research will be based on Cohen's d according to the equations below.

Cohen's d needs basic information for the calculations: group sample sizes, means, and standard deviations of the groups being compared. The following equation shows the computation of Cohen's d:

$$d = \frac{(\text{mean}e - \text{mean}c)}{Sw}$$

Adapted from Rosenthal (1994: 237)

$$Sw = \frac{[(N1-1)S1+(N2-1)S2\,]}{(\text{N}1-1)+(N2-1)}$$

Adapted from Hunter and Schmidt (1990: 271)

Mean*e* and meanc: represent the means of experimental and control group.
N1 and N2: stand for the sample sizes of experimental and control groups.
S1 and S2: stand for the standard deviations of the experimental and control groups.
The magnitude of the Effect size is small effect if (.2< *d* <.5), a medium effect if (.5 < *d* < .8), or a large effect if (*d* > .8).

As SPSS does not do the Cohen's d computations, they were done using Mathlab programme. It should be mentioned that each of the two groups (an experimental and a control group) will be contrasted in each test to show the magnitude of the effect of the independent variable.

To calculate the magnitude of effects, contrasts will include contrasting the effects between and within groups. That is, there will be a contrast between the pre-test and the direct post-test/ the pre-test and the delayed post-test/ the direct post-test and the delayed post-test for each group. This will be followed by contrasting the experimental groups and the Control

Group (experimental group 1 (Processing Instruction)/ experimental group 2 (Traditional Instruction)).

To sum up, the above section mainly exposed the kind of data available from the current research and examined the conformity of data with the assumptions of ANOVA. In the following section, data will be analysed in the following order: firstly, descriptive data will be presented so that means can be compared before any statistical tests are performed; this will be followed by running the ANOVA test and the Post Hoc tests: the Tukey post Hoc test. This will be followed by measuring Effect Size of intervention. As stated above, Effect Size is considered the most objective measure of the effect of instruction as it is assumption-free and not affected by sample size.

### 5.5.5 Analysing data and Reporting results

Table 5.6 and 5.7 show the mean scores of the three groups in the consecutive tests (comprehension and production).

Table 5.6 Descriptive statistics (comprehension)

| Test | Instruction | Mean | Std. Deviation |
|---|---|---|---|
| Pre-test | Processing Instruction | 1.90 | 0.86 |
| | Traditional Instruction | 2.00 | 1.15 |
| | Control Group | 2.00 | 0.92 |
| Direct post-test | Processing Instruction | 9.04 | 1.81 |
| | Traditional Instruction | 7.04 | 1.73 |
| | Control Group | 1.90 | 1.26 |
| Delayed post-test | Processing Instruction | 9.27 | 0.88 |
| | Traditional Instruction | 7.40 | 2.23 |
| | Control Group | 2.18 | 1.90 |

Table 5.6 shows that the mean scores of the Processing Instruction group and the Traditional Instruction Group for the post-test are better than the mean scores of the Control Group. The mean score of the Processing Instruction Group (9.04 in post-test 1

and 9.27 in post-test 2) are better than the Traditional Instruction Group mean score (7.04 in post-test 1 and 7.27 in post-test 2). Table 5.7 below shows the mean scores in the production section for the three groups.

Table 5.7 Descriptive statistics (production)

| Test | Instruction | Mean | Std. Deviation |
|---|---|---|---|
| Pre-test | Processing Instruction | .04 | .21 |
| | Traditional Instruction | .04 | .21 |
| | Control Group | .04 | .21 |
| Direct post-test | Processing Instruction | 6.27 | 2.97 |
| | Traditional Instruction | 6.13 | 2.21 |
| | Control Group | .13 | .46 |
| Delayed post-test | Processing Instruction | 7.27 | 1.77 |
| | Traditional Instruction | 6.31 | 2.62 |
| | Control Group | .18 | .50 |

Table 5.7 shows that the mean scores of the Processing Instruction group and the Traditional Instruction Group are better than the mean scores of the Control Group. The mean scores of the Processing Instruction Group (6.27 in post-test 1 and 7.27 in post-test 2) are better than the Traditional Instruction Group mean scores (6.13 in post-test 1 and 6.31 in post-test 2).

Thus, given the mean scores, it could be said that both the Traditional Instruction and the Processing Instruction groups improved from the pre-test to the direct post-test in both the comprehension and the production sections (Processing Instruction: 1.90, 9.04/ 0.04, 6.27; Traditional Instruction: 2.00, 7.04/ .04, 6.13). This improvement was maintained for the delayed post-test for both the Processing Instruction and Traditional Instruction groups (Processing Instruction: 9.04, 9.27/ 6.27, 7.27; TI: 7.04, 7.40/ 6.13, 6.31). The Control Group's scores remained far lower than the Traditional Instruction and Processing Instruction groups in both the comprehension and production tests (2.00, 1.90, 2.18/ 0.04, 0.13, 0.18).

In spite of the fact that mean scores showed differences between the groups, it is important to proceed to submitting data to ANOVA test to show if this kind of difference is significant or not. Thus, ANOVA was performed to give details in relation to the effects of instruction on students' performance before and after instruction. Table 5.8 summarises results for the three groups:

Table 5.8 Results from ANOVA test (comprehension)

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Instruction | 785.828 | 2 | 392.914 | 198.293 | .000 |
| Time | 769.404 | 2 | 384.702 | 194.149 | .000 |
| Instruction * Time | 405.141 | 4 | 101.285 | 51.116 | .000 |

The P value (i.e. significant value .05) in the above table shows that there are significant differences between the groups. Table 5.8 does not show the source of variation. Thus, ANOVA Post Hoc test was performed on the data to show the source of variations. As stated earlier, Tukey test will be used to show the source of variation. The following tables presents results from the Post Hoc tests:

Table 5.9 Multiple comparisons (comprehension)

| (I) Instruction | (J) Instruction | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| CG | PI | -4.7121* | .34987 | .00 | -5.5385 | -3.8857 |
| | TI | -3.4545* | .34987 | .00 | -4.2809 | -2.6282 |
| PI | CG | 4.7121* | .34987 | .00 | 3.8857 | 5.5385 |
| | TI | 1.2576* | .34987 | .00 | .4312 | 2.0840 |
| TI | CG | 3.4545* | .34987 | .00 | 2.6282 | 4.2809 |
| | PI | -1.2576* | .34987 | .00 | -2.0840 | -.4312 |

The comprehension data reveals that the Processing Instruction group and the Traditional Instruction Group significantly outperformed the no instruction group ($P < .05$) in both the direct post-test and the delayed post-test. Importantly, the Processing Instruction group was significantly better than the Traditional Instruction group in both the direct and delayed post-tests ($p < .05$).

As stated above, Effect Size calculations will be used to support the results from the ANOVA test. Tables below displayed the magnitude of effects (Table 5.11 present results for comprehension data and Table 5.12 for data from production tasks):

Table 5.10Summary of the results of Effect size within groups (comprehension data)

| COMPREHENSION | | | |
|---|---|---|---|
| | Pre-test/ Post-test1 | Pre-test/ Post-test2 | Post-test1 to Post-test 2 |
| PI | 5.0 | 5.2 | 0.1 |
| TI | 3.4 | 3.0 | 0.1 |
| CG | 0.0 | 0.1 | 0.1 |

The magnitude of change from the pre-test to the direct post-test and from the pre-test to the delayed post-test showed that the magnitude of effects is large (the effect of intervention is large) for the Traditional Instruction and Processing Instruction groups (d> .8), but small in the case of the Control group (d<2). As for the magnitude of change between the direct post-test and the delayed post-test, results shows that there were small effect sizes as Cohen's d was less than .2 in the three cases.

Moving from the effect sizes within the groups, Table 5.11 shows contrasts between groups.

Table 5.11 Summary of results of Effect size between groups (comprehension data)

| COMPREHENSION | | |
|---|---|---|
| Group | Cohen's d (Direct post-test) | Cohen's d (Delayed post-test) |
| PI vs. TI | 1.1 | 1.1 |
| PI vs. CG | 4.5 | 4.7 |
| TI vs. CG | 3.3 | 2.5 |

Results of Cohen's d shows a large effect size of intervention between the Processing Instruction group and the Tradition Instruction group in both the direct post-test and the

delayed post-test (d> .8). This means that the effect size of intervention was larger in the case of the Processing Instruction group. In the case of contrasting the effect of intervention when contrasting the two experimental groups with the Control Group, results shows that the effect of intervention is large as Cohen's d is larger than (.8). As the comprehension data is analysed, below is an analysis of the production data. Table 5.8 shows the results of ANOVA.

Table 5.12 Results from ANOVA test (production)

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Instruction | 790.636 | 2 | 395.318 | 145.695 | .00 |
| Time | 834.636 | 2 | 417.318 | 153.803 | .00 |
| Instruction * Time | 401.182 | 4 | 100.295 | 36.964 | .00 |

The P value (i.e. significant value .05) in the above table shows that there are significant differences between the groups. However, the above table does not show the source of variation. Thus, ANOVA Post Hoc test was performed on the data to show the source of variations. The following tables presents results from the Post Hoc tests:

Table 5.13 Multiple comparisons (production)

| (I) Instruction | (J) Instruction | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| CG | PI | -4.4091* | .37882 | .000 | -5.3038 | -3.5143 |
| | TI | -4.0455* | .37882 | .000 | -4.9402 | -3.1507 |
| PI | CG | 4.4091* | .37882 | .000 | 3.5143 | 5.3038 |
| | TI | .3636 | .37882 | .603 | -.5311 | 1.2584 |
| TI | CG | 4.0455* | .37882 | .000 | 3.1507 | 4.9402 |
| | PI | -.3636 | .37882 | .603 | -1.2584 | .5311 |

Production data reveals that the Processing Instruction Group and the Traditional Instruction Group significantly outperformed the no instruction group (P < .05). Different from the comprehension data, no significant difference could be found between the Processing Instruction Group and the Traditional Instruction group in the direct post-test and the delayed post-test (P> .05). To support results, Table 5.12 shows the results of Effect Size analysis.

Table 5.14 summary of the results of Effect size within groups (production data)

| PRODUCTION | | | |
|---|---|---|---|
| | Pre-test/ Post-test1 | Pre-test/ Post-test2 | Post-test1 to Post-test 2 |
| PI | 2.9 | 5.7 | 0.4 |
| TI | 3.8 | 3.3 | 0.0 |
| CG | 0.2 | 0.3 | 0.1 |

The magnitude of effects from the pre-test to the direct post-test and from the pre-test to the delayed post-test showed that the effect is large (the effect of intervention is large ) for the Processing Instruction groups (d> .8) and the Traditional Instruction Group (d> .8), but small in the case of the Control group (d >5). However, by comparing the magnitude of effects from the direct post-test to the delayed post-test, results shows that the magnitude of effects is small in the three cases (d< .5). Moving from the effect sizes within the groups, Table 5.15 shows contrasts between groups:

Table 5.15 Summary of results of Effect size between groups (production data)

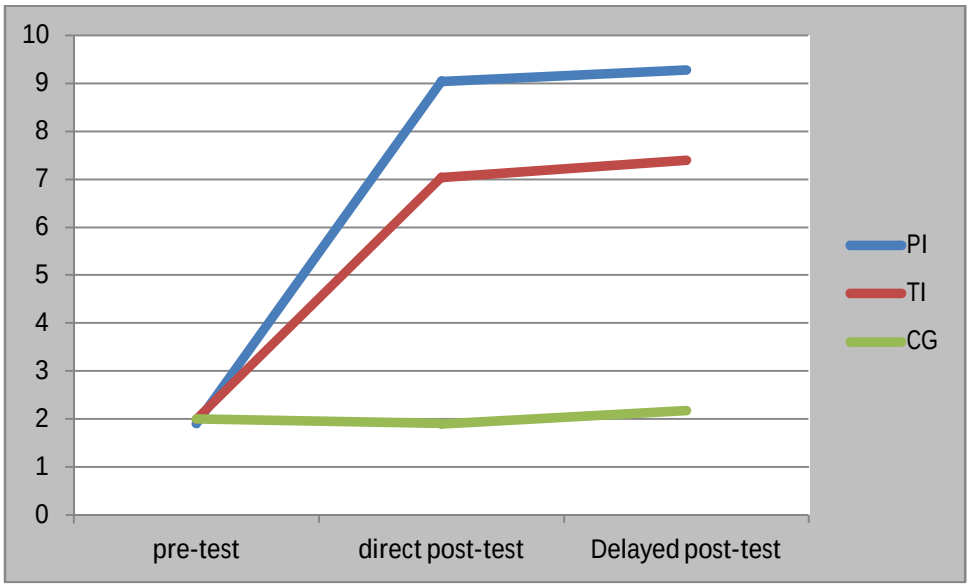
| PRODUCTION | | |
|---|---|---|
| Group | Cohen's d (Direct post-test) | Cohen's d (Delayed post-test) |
| PI vs. TI | 0 .0 | 0.4 |
| PI vs. CG | 2.8 | 5.5 |
| TI vs. CG | 3.7 | 3.2 |

Results of Cohen's d show no difference in effects between the Processing Instruction treatment and the Tradition Instruction treatment in the direct post-test. This result changes in the delayed post-test with the d showing a small effect between the Processing Instruction treatment and the Tradition Instruction treatment (d .4). Contrasting the two experimental groups with the Control Group, results shows that the effect of intervention is large as Cohen's d was larger than .8 in all the cases. This means that the effects of intervention in the case of experimental groups were far larger than that of the Control

Group. Importantly, the results of Cohen's d gave exactly the same interpretations gained from the results of the ANOVA test.

Moving from the statistical analysis above, and for clarification, Figure 5.1 below shows the interaction plot between time and instruction for the three groups:

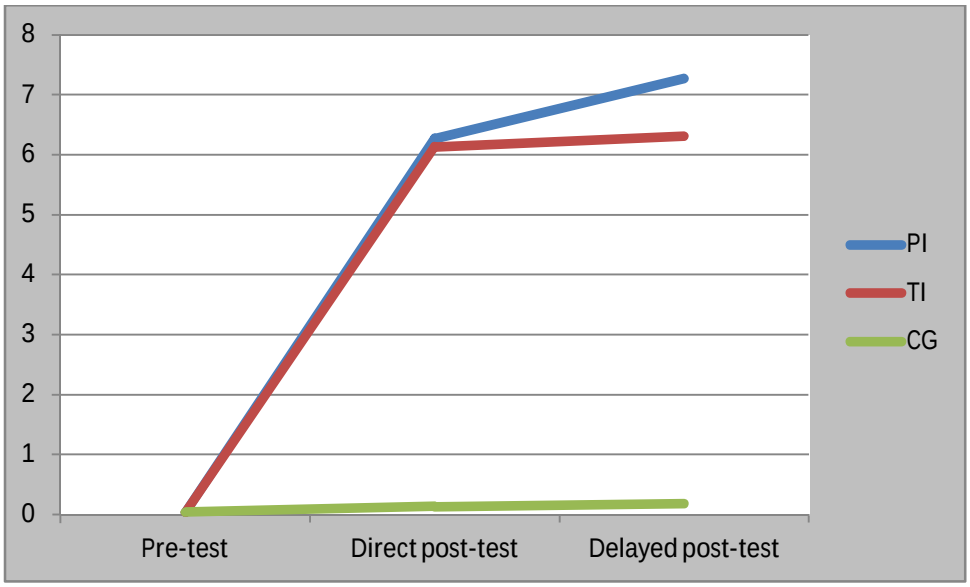
Figure 5.1 Interaction plot of Time and Instruction (comprehension section)




PI: Processing Instruction Group, TI: Traditional Instruction Group, CG: the Control Group

Figure 5.1 shows that the Traditional Instruction and Processing Instruction groups had improved after instruction. The Processing Instruction group and the Traditional Instruction group maintained nearly the same line of improvement from the direct post-test to the delayed post-test. Still, there were significant difference between the Processing Instruction group and Traditional Instruction group as the first group significantly outperformed the second group. The no instruction group did not show any significant improvement after mere exposure to relative clauses, as this group maintained the same level of performance in the three tests. So, even though the line in the delayed post-test shows an improvement for the Traditional Instruction group (1.90 to 2.18), this improvement proved not to be significant statistically. Figure 5.2 below shows the interaction plot between time and instruction for the three groups when it comes to production data:

Figure 5.2. Interaction plot of Time and Instruction (production)




PI: Processing Instruction Group, TI: Traditional Instruction Group, CG: the Control Group.

Figure 5.2 shows that the no instruction group remained far lower than the Processing Instruction and Traditional Instruction groups in terms of marginal means. In addition, students in the Traditional Instruction group maintained their performances from the direct post-test to the delayed post-test. However, the Processing Instruction group shows an improvement from the direct post-test to the delayed post-test.

In a nutshell, the Processing Instruction and Traditional Instruction groups were found to be significantly better than the no instruction group. The Processing Instruction group significantly outperformed the Traditional Instruction group in the comprehension tests. This outperformance did not prove to be significant in the production data, as the greater gains in the Processing Instruction group were not significant statistically. As data were analysed and results were presented, below is an exploration of students' perception and attitudes to English lessons in general and Processing Instruction in particular.

## 5.6 Students' perception and Attitudes to Processing Instruction

### 5.6.1 Analysis of the Questionnaire

The questionnaire was used to get feedback from students who received Processing Instruction. The importance of this questionnaire is that it could be connected to the

general results of the experiment. So, as it was of interest to know about the way students reacted to Processing Instruction and the way their performance was affected by Processing Instruction, a questionnaire was given to students in the Processing Instruction Group directly after the direct post-test.

The questionnaire was designed in English (as the researcher was in class when students answered the questionnaire) and it was expected that students would answer, most of the questions at least, in English (as they had been studying English for nine years). However, it was found that most students used mainly Arabic to answer the questions. This could have been a result of students' age and proficiency in English. Being in classroom, the researcher's role was only to explain the questions and to answer any queries with no interference in participants' responses. The classroom allows students to write freely even if a teacher is present (see figure 4.1). Participants were told not to write their names. Participants knew that their answers would anonymous which encouraged them to criticise the teaching they usually receive especially in the last question which asked them if they still wanted to say anything.

The questionnaire was designed so that students did not have to give long replies. That is, most of the questions required students to tick the appropriate answer. The questionnaire consisted of three sections comprising a total of 18 questions (see appendix 17). The first section covered questions related to students' motivation and the way they study English. The second section came in the form of ratings to elicit information from students in relation to the importance of certain activities in an English lesson. The last section was mainly to get students' feedback in relation to the lessons they had on relative clauses.

Students were asked at the beginning of the questionnaire to provide first name and age. Students' age was between 14 and 16 (14: two students; 15: twelve students; 16: eight students). Question 1 and 2 may help in identifying students' motivation to learning English and the reason for this motivation.

Q1. Are you motivated to learn English? If yes, move to question (2). If no, move to question (3).

Not surprisingly all replies were positive to the first question (22 students ticked yes) as Syrian students are always interested in learning foreign languages in general and English

language in particular. This can be one of the reasons that encouraged the Ministry of Higher Education to have recently new departments (e.g. Russian Language and Literature department, Japanese Studies and Literature department, Spanish Language and Literature department, Dutch Language and Literature, and Farsi Language and Literature department) to be added to the ones already available since 1947 (English Language and Literature and French Language and Literature). However, the number of students in the English department at Damascus University is far larger than that in the newly opened departments (in the English department, students number reaches up to 9000 students. As for the other departments, it is far less than this number.

The second question in the questionnaire asked students about the reason behind their motivation to learning English.

Q2 Which of the following reasons could be the possible reason behind your motivation?

Table 5.16 Summary of responses (Q 2)

| Reasons behind being motivated to learning English | Replies |
|---|---|
| 1. To travel abroad | 5 |
| 2. To become a teacher of English | 3 |
| 3. To get the opportunity for getting a good job | 11 |
| 4. other | 3 |

Motivation to learning English varies but most of the answers revealed that students have an instrumental motivation to learning English (to get the opportunity for getting a good job). The answers of the three students who chose other are listed below:

1. I want to be able to speak English
2. To study English literature
3. I like learning foreign languages

These replies may give an important indication to the fact that although most responses were in favour of the third option (instrumental motivation), some students were motivated to learn English because they are interested in developing speaking competence in the use of English in general.

Unfortunately, although textbooks are supposed to help those students to reach to what they hope for, it is not usually the case that the conditions of English classes will help in this. In other words, the number of students in classes (between 25 up 38) may not help in obtaining a spoken competence as it is not usually the case that all students will be able to have the opportunity to communicate and speak in the 45 minutes lesson. Besides, focus in English classes is usually on the sections which are of relevance to the exams rather than on the sections which require students to listen or to speak the language. So keeping in mind that learners do not use English outside classrooms, it is not expected that fluency in English can easily be obtained.

Question three asked students whether they receive any help with English from their families or not.

Q3 Do you depend solely on the teacher's explanation to understand the lesson? If yes, move to section 2. If no, move to question 4.

Students' responses to this question can be summarised as follows:

Table 5.17 Summary of responses (Q3)

| Do you depend solely on the teacher's explanation to understand the lesson? | Replies |
|---|---|
| Students depend solely on what they receive in classrooms to understand English lessons | 18 |
| Students do not depend solely on what they receive in classrooms to understand English lessons | 4 |

18 students depend solely on what they receive in classrooms to understand English lessons while 4 students receive help from their families. As for the kind of help they receive, the answer was given in question five:

Q5 What kind of help do you get?

Student 1 explaining the points the student could not understand from the teacher and to know the meaning of some words.

Student 2 grammar explanation, homework revision and to know the meaning of some words.

Student 3 grammar explanation.

Student 4 grammar explanation.

In spite of the fact that variables which may affect results were considered by the researcher (no teaching on relative clauses till the research is over), answers to this question reveal that some students could have received a kind of explanation related to relative clauses although this is not certain (this is one of the variables which may not be possible to be controlled by any researcher). Another important point which could be elicited from the responses to this question is that students' focus is on grammar as they ask members of family to help them in understanding the grammar rule. However, this may not be in line with English textbooks which are supposed to focus on communication rather than grammar rules. Again, this is another point to be considered by English teachers in Syria as the above responses reveal that students' concern is still focused on their performance in exams rather than developing listening or communicative competence.

Question 6 consists of 7 points. Students are asked to place 7 points in a range of importance.

Q6 To what extent do you think that the following points are important in an English lesson? Please tick as appropriate.

Table 5.18 Summary of responses (Q6)

| | | Scale | | | | |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** |
| 1 | Explicit explanation of the targeted form | 22 | - | - | - | - |
| 2 | Explaining the normal difficulties Syrian students usually face in learning the target form | 20 | 2 | - | - | - |
| 3 | Providing students with many examples of the targeted form after the explicit instruction | 21 | - | 1 | - | - |
| 4 | Urging students to practice the use of the targeted structure directly after the explicit instruction | - | - | 1 | 9 | 12 |
| 5 | Oral practice | 1 | 4 | 7 | 5 | 5 |
| 6 | Written practice | 21 | 1 | - | - | - |
| 7 | Feedback | 22 | - | - | - | -- |

**A= extremely important; E= not important at all**

What could be elicited from the above table is that explicit explanation, explaining the difficulties in acquiring the target form, providing student with many examples of the target form, written practice, and feedback sessions are found by students to be the most important and useful elements of an English lesson. The least useful to students were oral practice and urging students to produce the form directly after instruction. Seven responses were neutral as the scale starts with the most important to the important, neutral, not important, and not important at all as the last cell in the scale.

To make it clearer, the following table summarises responses by changing the scale to the following: 1 and 2 are considered as positive response, 3 is considered as a neutral response, and 4 and 5 are considered as the negative response.

Table 5.19 Classifications of responses (Q 6)

| | | Positive response | Neutral response | Negative response |
|---|---|---|---|---|
| 1 | Explicit explanation of the targeted form | 22 | | |
| 2 | Explaining the normal difficulties Syrian students usually face in learning the target form | 22 | | |
| 3 | Providing students with many examples of the targeted form after the explicit instruction | 21 | 1 | |
| 4 | Urging students to practice the use of the targeted structure directly after the explicit instruction | | 1 | 21 |
| 5 | Oral practice | 5 | 7 | 10 |
| 6 | Written practice | 22 | | |
| 7 | Feedback | 22 | | |

Again, putting oral practice at the end of scale (the least important) could be connected to the fact that students' focus is usually on the final exam where they will not be asked to speak at all. In other words, to students, written practice is useful because it is similar to questions of the final exam which is not the case for oral practice as it is not of relevance when it comes to exams. However, for few students, oral practice is of importance especially for students who expressed an interest in developing spoken competence and in learning foreign languages.

Moving to section three of the questionnaire, the focus is on students' feedback in relation to Processing Instruction.

Question 7 asks students whether they think that the lessons they had on relative clauses differ from the way they are used to or not.

Q7 Do you think that the lessons you had on relative clauses were different from the way you are used to? If yes, move to question (8); if no, move to question (9).

All responses were positive to this question as for the nature of these differences, question 8 asked students to write down the differences they were able to identify.

Q8 How would you explain these differences?

Students' replies could be summarised in the following:

1. Classroom activities were easier as the answer was there.

2. Explanation was clearer

3. Attracting our attention to problematic issues when learning English relative clauses.

4. Examples were helpful in understanding the lesson.

5. Translating the difficult points in the lesson.

6. The materials distributed to students.

7. Explanation of the grammar rule was different

What could be of relevance to Processing Instruction is the fact that students were positive towards giving the activities with the answer provided and most importantly the fact that students valued the reminder of the problematic strategies usually followed by learners whose L1 is Arabic in processing English grammar. Students also found the explanation to be clearer which could be a result of the use of Arabic in explaining difficult points and using many examples to help students in processing relative clauses. Besides, this could be a result of the researcher's focus during these classes to help students in processing English relative clauses (one of the main aims of Processing Instruction). Although number six is not related to Processing Instruction, it could be connected to what happens in normal classes where students and teachers are usually dependent on the explanation and activities in textbooks only (it is not usually the case that any materials will be distributed to students as they cover units in textbooks only).

Question 9 asks students whether they think that the teacher's focus on giving many examples of the different types of relative clauses helped them in understanding relative clauses or not.

Q9 Do you think that the teacher's focus on giving many examples of the different types of relative clauses helped you in understanding relative clauses?

The answer was positive as all students valued the importance of these examples in understanding the lesson on English relative clauses.

Question 10 asked students if they prefer to have production practice they are used to in normal English language classes or not.

Q10 Or, do you think that the production practice you are used to is more useful for you?

All responses were negative as they preferred giving examples after instruction over production practice. For the researcher, participants' responses reveal a real problem in Syrian classrooms. This problem is connected to students' anxiety which seems to play a crucial role. In other words, output-based activities which ask students to produce the target grammar forms cause anxiety to students. So, to them, the big difference between the instruction they are used to and the one they received during the treatment is related to anxiety. Participants expressed their views by commenting saying that we do not feel (translated from Arabic) 'that we were not stressed during the class the way we usually are'. Anxiety is not a main point in Processing Instruction, but it seems that it has a significant role for some students. This supports Processing Instruction which aims at facilitating processing target forms. After all, the aim of instruction is to facilitate and speed up learning.

Question 11 asks students whether they think that the differences between English and Arabic relativisation systems caused any problems to students when they learn English language.

Q11 Do you think that the differences between English and Arabic relativisation systems cause you problems? If yes, move to question (12); if no, move to question (13).

All responses were positive as students connected between Arabic language and the difficulty they face in learning English. Question 12 asks students to give examples of the differences between Arabic and English which may cause difficulty.

Q12 Can you give an example?

To students, the points which caused problems are the ones listed below:

1. The non-availability of an equivalent to WHOSE in Arabic

2. WHOM/ relative pronouns.

The above responses reveal that students are conscious of the differences between Arabic and English when it comes to relative clauses. It seems that participants can use Arabic as a resource to resort to if when processing target forms.

Question 14 asks students if they think that the teacher's reminder of the problematic strategies usually followed by Arab learners was helpful.

Q14 Do you think that the teacher's explanation of the problematic strategies used normally by Arab learners in processing English relative clauses was helpful?

Responses to this question also revealed that all students found this reminder to be of importance in understanding the lesson on relative clauses.

Question 15 investigated students' satisfaction of their performance in the test after the Processing Instruction treatment.

Q15 Are you satisfied with your answers in the direct post-test which included questions which require you to produce relative clauses? If yes, move to question (17); if no, move to question (16).

Table 5.20 Summary of responses to (Q15)

| Are you satisfied with your answers in the direct post-test which included questions which require you to produce relative clauses? | Responses |
|---|---|
| YES | 18 |
| NO | 4 |

18 students were satisfied. As for the other 4 students, they misinterpreted the question by referring to the pre-test. In other words, they replied to question 16 by saying that it is because we had no lessons on relative clauses.

Question 17 gives students the opportunity to suggest any points they wish to be included in English lessons to be more successful.

Q17 What are the points which you wish to be included in English lessons to be more successful? Please write three suggestions.

Students' suggestions could be summarised in the following:

1. Using Arabic to explain English grammar rules.
2. Explaining the common errors Arab students make in the use of English relative clauses.
3. Giving as many examples as possible
4. Giving options in any activity
5. More focus on discussing students' answers (feedback sessions)

We cannot be sure whether it is chance or that VanPatten (1996) has based his model on a solid universal background as most of the suggestions can be fitted within the Processing Instruction model.

The last question gave students the opportunity to write anything they would like to add. Most of the responses to this question were to thank the teacher for her lessons on relative clauses. In addition, some students asked for more focus on vocabulary in English classes.

In concluding this section, it could be said that students reported an interest in having explicit instruction in relation to English grammar rules in the Processing Instruction methodology. It was also revealed that students preferred written activities over oral activities.

### 5.7 Field-Notes

Field note data was used as a mean to document participants' behaviour during the experiment inside and outside classrooms. As the researcher is the one who taught during the experiment, it was not difficult to observe closely participants' behaviour during the experiment. Students' seating helped a lot in this as all students were in front of the teacher. Thus, the researcher was able to see if students give full attention to the explanation or not. Besides, the researcher was able to see students' facial gestures which could be of importance in certain circumstances especially to evaluate their understanding of the lesson. Description of the main relevant issues could be classified into the following:

### 5.7.1 Use of Arabic

As stated earlier, teachers of English in Syria are advised to use only the English language in classrooms. However, when it comes to actual teaching, this cannot work so easily due to students' level of proficiency in English. Besides, due to time limit (45 minutes), it is sometimes necessary to use Arabic to explain certain points as this can facilitate learning.

Before starting the experiment, and during the sessions with the normal class teacher, she confirmed the fact that the application of this rule cannot work thoroughly. The researcher was able to realise the importance of using Arabic language from the first class. In other words, there was no escape from using Arabic language when students interrupted the teacher to ask about the meaning of certain words taking in consideration time limit 45 minutes (some students were using electronic dictionaries rather than asking the teacher) or to ask about the grammar rule. Another use of Arabic was when students could not understand exactly what the teacher was saying (this was elicited from their facial gestures or when they looked at each other and smiled). Apart from the above cases, English was the main medium of instruction.

Interestingly, during the classes, students were trying to use English to ask questions, although not all the time. In other words, students' use of English was restricted by the lack of vocabulary to express what they want to say rather than a reluctance to use English. One of the interesting examples was when a student asked whether WHOSE is similar to WHO and WHOM in relation to human/ non-human forms as WHO is used when the subject is human and WHICH when the subject is MO ENSAN (to mean when the subject is non-human). So, the student interrupted her English sentence by using one Arabic word (MO ENSAN) to ask her question.

### 5.7.2 Students Behaviour during the classes

It should be mentioned that students who pass to the tenth grade are usually good students as there is an entry requirement for the tenth grade. So, it was not surprising that most of the students were so curious to learn, to ask, and to understand the lessons.

As a result of students' motivation to learn English, there was a kind of competition between students during classes to participate and to answer questions. This was noticed by the number of hands raised after asking a question or to answer classroom activities.

### 5.7.3 The Control Group

The most interesting and important incident during the experiment (it is a problematic one as well) is related to students in the Control Group. In spite of the fact that the researcher did not tell them that they were being taught in a different method from the other two groups, students seemed to be aware of this fact. Knowing that they were taught in a different way, students tried hard to elicit the grammar rule from the text discussed during classes and they tried to identify, underline, and understand all the relative pronouns in the texts being discussed. For example, depending on the questions of the pre-test, some students underlined relative pronouns available in the texts and asked the teacher about them. Interestingly, students were able to underline all relative clauses in the texts during silent reading. So, students' focus was on both understanding the text and eliciting the use of relative clauses by underlying relative clauses. However, this did not help students in this group to show any significant improvement in the direct and delayed post-tests.

This is, of course, a negative point in experimental designs where participants in control groups do not receive the same opportunity and kind of knowledge participants in the experimental groups receive. As stated in section 4.4, this is one of the ethical dilemmas in experimental designs. Having a Control Group is one of the important points in experimental research designs, but it is the most problematic one as well, as students in control groups do not get the same benefit participants in experimental groups usually get. As mentioned above, in planning for the experiment, the researcher planned to teach the method which proves to be effective to the groups which do not receive it. However, when it came to the actual situation, this was not possible to be done. In other words, it was planned by the researcher to teach the Control Group using the method or the model of instruction which proved to be the best. However, this was not possible as getting permission to go into schools is not usually an easy process especially if normal classes will be stopped for a researcher to conduct a research. Thus, permission was only possible for the main classes and the tests (in total, permission was for 18 classes only), but was not possible for any extra classes as this may have affected the progress of normal classes where teachers have a schedule to follow.

The only possible option available to the researcher was to give a copy of the instruction materials, activities, tests with answer key to the class teacher to make the materials available to the interested students (I guess they will be so keen to take them). Besides, the

normal class teacher was also interested and had her copy of the materials stressing the point that she will teach the points she finds useful to students in term two where they will study English relative clauses as scheduled. This is a good point as this will, hopefully, enable students in the Control Group to have the same opportunity and compensate for what they missed during the experiment.

### 5.8 Summary

This chapter has presented an analysis of the data of the current research. It can be concluded that data analysis is not always a straightforward process especially if statistics is involved. For example, in the current research, some issues were problematic such as the assumptions of parametric tests and managing the assumptions to get reliable results.

For the researcher, it is not about which test to use as much as which test can help in answering the questions. In previous literature, we have many contradicting views. We have those who recommend parametric tests over non-parametric tests. Then, we have those who consider statistical significance as not useful recommending Effect Size as an alternative.

Thus, in investigating this area, the researcher found that using more than one procedure for data analysis is the only way out of the contradicting views (parametric/non-parametric, statistical significance/ Effect Size and so on). So, to get out of this endless argument in the field of math and statistics, the researcher used two procedures so that the analysis can be more robust and results more trustful. This argument reminds me of what Richards (2003) stated. For Richards, we do not have to change others ideas, we have to be convincing in our presentations. So, following this, the researcher used two procedures for data analysis together with the bare presentation of mean scores for the analysis.

# Chapter Six: Discussing Results

## 6.1 Introduction

This chapter presents a discussion of the results in light of the research questions. There will be a discussion of the results of the consecutive tests in relation to Syrian students' comprehension and production of English relative clauses. Discussion will be presented depending on the results of the ANOVA test and Effect Size calculations. These results will be connected to the findings of the questionnaire and field notes so that all sources of information are integrated in order to have a comprehensive view of the results of this research.

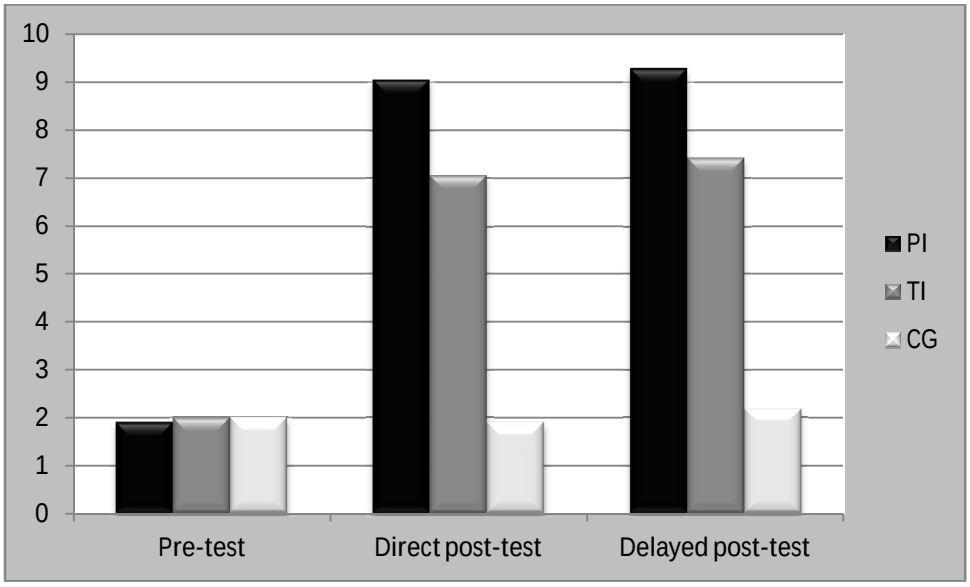
The chapter will proceed as follows: the first section discusses the effects of Processing Instruction on Syrian learners' comprehension and production of English relative clauses in light of the results of the ANOVA test and Cohen's d calculations. This will be followed by discussion of the retained effects of Processing Instruction over time. The subsequent section focuses on students' attitudes to Processing Instruction.

## 6.2 Effects of Processing Instruction on Processing English Relative Clauses

### 6.2.1 The effects of intervention on students' performance in the direct post-test (comprehension)

According to the results of the ANOVA test above, it was found that participants in the Processing Instruction Group and Traditional Instruction Group improved after intervention. The Processing Instruction groups significantly outperformed the other two groups in the comprehension tasks ($P < .05$). The Traditional Instruction Group significantly outperformed the Control Group ($P < .05$). These findings could be of importance as it gives further support to the effectiveness of Processing Instruction when it comes to the acquisition of English relative clauses. Of relevance to the first research question, it could be said that learners significantly improved their performance after receiving Processing Instruction treatment. Figure 6.1 below summarises the three groups' performances before and after instruction.

Figure 6.1 The three groups' performance (comprehension)




The figure above clarifies the differences between students' performance in the three groups in the three consecutive tests. It is important to discuss the reasons which led to the outperformance of students who received Processing Instruction when it comes to comprehending English relative clauses. Explicit instruction was the same for the Processing Instruction and Traditional Instruction groups. The difference was only in the kind of activities students received during treatment. So, the difference in performance is to be attributed to the kind of practice the two groups received, and it could also be attributed to the reminder of problematic strategies usually followed by learners whose L1 is Arabic; this point was recommended by students when answering the questionnaire. Table 6.1 below summarises the elements used in instructing the three groups.

Table 6.1 Summary of the elements included in each treatment

| | Explicit instruction on English RCs | Explicit reminder of problematic strategies | Structured input activities | Output-based activities |
|---|---|---|---|---|
| Processing Instruction | √ | √ | √ | × |
| Traditional Instruction | √ | × | × | √ |
| Control Group | × | × | × | × |

Both the Traditional Instruction Group and the Processing Instruction Group received explicit instruction on relative clauses. The difference was in the activities, as the Processing Instruction Group received Structured Input Activities and the Traditional Instruction Group received output-based activities. The No-instruction group received no explicit instruction on relative clauses, but there were some examples of relative clauses within the texts discussed during the treatment. As the Processing Instruction Group is the group which significantly outperformed the other two groups, it may be worthwhile discussing the reasons which could have led to the outperformance of this group.

One important point to be mentioned at the beginning is that the Processing Instruction treatment is sometimes misunderstood as a passive approach to teaching grammar. However, this is not the case, as the point in Processing Instruction is that students should always do something with the input they receive (they should not be passive). That is, students should always be involved in tasks which help them in processing input, accommodating and restructuring the input they are receiving for intake into their linguistic system. This is done through the Structured Input Activities which students have participated in during the treatment.

Structured Input Activities proved to be an effective instrument for helping learners to process English relative clauses. This was clear in the results of the direct post-test (comprehension), as students in this group significantly outperformed students in the other

two groups. This could be an indication of the fact that students in this group were able to internalise relative clauses to be part of their linguistic system. In other words, altering learners' problematic processing strategies affected learners' performance, as learners in the three groups performed differently.

Results confirmed the first hypothesis that instruction which is directed at how learners process input can help learners in the comprehension of English Relative Clauses. Findings indicated that we can depend on the principles suggested by VanPatten (1996, 2007) to formulate the Structured Input Activities, as this can be helpful to learners. In the case of this research, learners pointed to the reminder of the problematic strategies usually faced by Arab learners in processing English relative clauses as a useful and helpful point during the treatment. This was also reflected in the their performance, which was measured using Cohen's d. Cohen's d showed that Processing Instruction has a large effect (d> .8).

Learners also valued the feedback they received after answering the activities as being helpful to them. VanPatten (2002) stressed the importance of feedback within Processing Instruction as it "lets the learner's processing mechanism know there is a failure" (2002: 248). That is, the failure to process the target item correctly would be adjusted by the Structured Input Activities. In this case, failure leads to adjustment which, in turn, leads to internalisation.

Thus, in line with the previous research (summarised in Tables 3.3 and 3.4) which provided support for Processing Instruction, the current research provided further evidence of the effectiveness of Processing Instruction, as the generalisability of Processing Instruction is investigated on the acquisition of English relative clauses with learners whose first language is Arabic.

However, given that the Processing Instruction Group in the current research did not significantly outperform the Traditional Instruction Group in the production of relative clauses, the role of output-based/ input-based activities in language learning stills need further research.

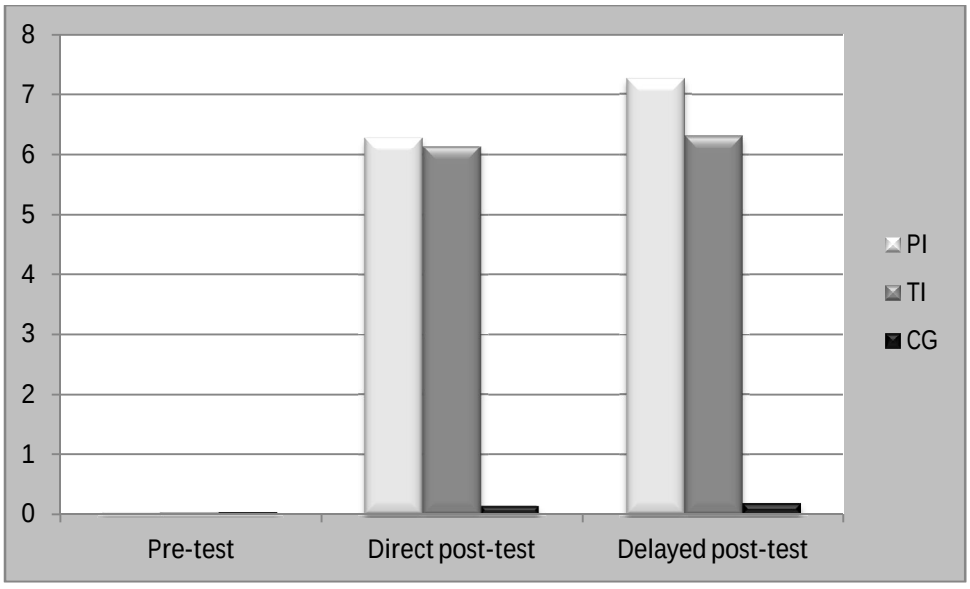
To sum up, Processing Instruction was mainly about pushing learners away from problematic strategies to facilitate and, at the same time, help learners in processing input.

For that purpose, students were not asked to produce relative clauses. Rather, the Structured Input Activities were used to force learners in the Processing Instruction Group to process input correctly. This helped students in "(1) making form-meaning connections, and (2) parsing sentences (who does what to whom)" (VanPatten, 2009: 51). The above-mentioned discussion gives an explanation as to the significant outperformance of students in the Processing Instruction Group in comparison with the other two groups. The following section focuses on discussing the results of the production tests (direct post-test).

### 6.2.2 The effects of intervention on students' performance in the direct post-test (production)

In the direct post-test, it was found that the Processing Instruction Group and Traditional Instruction Group significantly outperformed the No-instruction group ($p < .05$). There was no significant difference between the performance of learners in the Processing Instruction Group and those in the Traditional Instruction Group. Figure 6.2 below clarifies students' performance in the three consecutive tests (production).

Figure 6.2. The three groups' performance (Production)




Before embarking on the research, it was hypothesised that students in the Processing Instruction Group would improve their performance after treatment, as it was expected that better processing would lead to better performance. Results were in line with this in the case of comprehension, but in the production of English relative clauses, there were no

significant differences between the Processing Instruction Group and the Traditional Instruction Group. The important point to be mentioned is that participants in the Processing Instruction Group were able to produce relative clauses, although learners were never asked to produce relative clauses during treatment. This shows the kind of development and change in students' linguistic system, which enabled them to access relative clauses correctly without receiving any output-based practice during treatment. This finding is in line with VanPatten (1996) in relation to the role of Processing Instruction in changing learners' linguistic system, as it pushes learners to process the target item correctly for access and use.

On purpose, the Structured Input Activities did not ask students to produce relative clauses, as this is one of the important points which VanPatten stressed (1996) in the use of Structured Input Activities. Focusing on activities which do not ask learners to produce relative clauses is in line with the learnability hypothesis, according to which, asking students to produce the target structure when they are not ready to do so may hinder the acquisition process (see Pienemann, 1984). It is also in line with Krashen's views (1982) in relation to the negative effects of asking second language learners to produce a structure, as this may block learners from learning it. Thus, in the current research, after internalising/ processing relative clauses, learners were ready to produce relative clauses without receiving any output-based practice. The primacy of input-based practice could be connected to the fact that this kind of practice reduces students' anxiety (Ellis, 1994), as sometimes students are not ready to be asked to produce the targeted form/ structure.

In the current research, participants in the Traditional Instruction Group showed improvement in their performance after instruction. Learners' performance in the Traditional Instruction Group was expected as most of the activities during the treatment focused on output-based practice by having activities such as sentence completion, fill in the gap and interaction tasks (section 4.5.3.2). Thus, the improvement in the performance of learners in the Traditional Instruction Group could be attributed to the output-based practice they received. Students could have gained a kind of knowledge through the output-based practice as the production practice was more meaning-oriented. So, it could be the researcher's focus on meaningful activities that helped students in the Traditional Instruction Group to improve their performance. It seems that depending on these activities, students in the Traditional Instruction Group were able to construct knowledge

about relative clauses as a result of the explicit instruction and the output-based practice they received during treatment.

Output-based activities could have helped learners to develop knowledge of how to produce the target form/structure, which may help in fluency, but not in internalising/ acquiring the target structure. This is asserted by Gass, who stated that the point is not about the direct changes which take place; rather, the main issue is the real changes to learners' linguistic system (1997: 126). Thus, the Traditional Instruction Group's performance can be a direct result of the instruction and activities, but not necessarily the actual development in learners' linguistic system. Both groups improved after instruction. However, the difference is that one group performed according to the practice it received, but the other group's performance was beyond what participants have received. Participants in the Processing Instruction Group were able to produce relative clauses without receiving any practice in doing so. So, away from the statistical differences between the two groups, the important point is that participants in the processing Instruction group were able to produce a form they were never asked to produce. This can be explained by reference to VanPatten (1996), who stressed the role of manipulating input to help learners to adjust new rules into their linguistic system, as this will enable them to access this data.

As stated above, VanPatten (1996) claimed that production practice is of importance to second language learners, helping in fluency in the target language, but it does not help in putting the grammar in the learner's head or in processing input. This recalls of Krashen's claim that Comprehensible Input accounts for learners' production abilities. As for producing the targeted item, it "…emerges. It is not taught directly" (1982: 22). Although Krashen encouraged teachers to provide comprehensible input that does not necessary follow a particular sequence for teaching grammatical structures, his views on language production are in line with VanPatten, with both in agreement that language production emerges, rather than being taught.

Thus, the kind of activities participants received during the Processing Instruction treatment seems to have had an effect on learners' linguistic system, enabling them to perform well on the different tasks after the treatment. However, the fact that learners in the Traditional Instruction Groups also improved is in line with Swain's views (1985) in

relation to the importance of output-based practice in helping students to enrich their intake. Both VanPatten (2002) and Swain (1985) may agree on one point: output helps in developing fluency in the target language. This fluency is assumed to be a result of producing the target language repeatedly. The difference between the views of VanPatten and Swain is not on the role of output-based practice in the fluency of the second language; rather, the argument is related to questioning the role of output-based practice and input-based practice in helping students in processing input to lead to changes in the second language grammar (putting grammar in head).

Processing Instruction is based on several universal principles (see section 4.3.1.1) which expose the problematic processing strategies followed by learners when processing second language grammar. One of these principles is the reminder of the problematic/default strategies usually followed by learners whose L1 is Arabic when processing English relative clauses. Thus, the target was always juxtaposed to the problematic one. It seems that this helped learners in generating their own rules away from the default one. That is, learners were exposed in the structured Input Activities to the right and wrong answer where they have to develop a rule to be able to process the target and answer questions.

In line with the above findings is the feedback students gave through the questionnaire. Students in the Processing Instruction Group valued the role of reminding them of the problematic strategies usually followed by learners whose L1 is Arabic in processing English relative clauses. Students also valued the role of the kind of practice they received and they viewed it in their language as ‘different activities from the ones we are used to’.

In brief, it seems that the Structured Input Activities used in this research helped students in converting the data in the input to become part of the developing system so that the developing system had the time to accommodate and restructure in response to the new data. As a result, learners were able to access and use the processed data.

### 6.2.3 Retained Effects over Time (delayed post-test)

One of the questions which was investigated in this research was whether the positive expected results would hold over time or not. It was of interest to know whether the effects of Processing Instruction would be retained over time or not. Delayed post-test results

showed that learners in the Processing Instruction Group retained their knowledge and significantly outperformed the other two groups in the comprehension tests.

Importantly, Figure 5.1 shows that the performance of the Processing Instruction Group was retained over time. Performance of students in the Traditional Instruction Group was also retained over time, as students' mean scores remained nearly the same from the direct post-test to the delayed post-test. Performance of students in the No-instruction group was the same in the two post-tests without any improvement.

Data from production tests show that learners in the Processing Instruction Group and Traditional Instruction Group improved equally after treatment in the direct post-test. However, it is important to note, depending on Figure 5.2, that the line moved up for the Processing Instruction Group but remained on the same level for the Traditional Instruction Group. This could be of significance, as it refers to the fact that students' in the Processing Instruction Group were able to improve their performance after four weeks, which means that there was a change and development in students' linguistic system to be able to improve their performance from the direct post-test to the delayed post-test. Thus, it could be said that the positive effects of the Processing Instruction treatment were retained over time as a result of the changes that occurred in the linguistic system. One may question the retained effects of Traditional Instruction. The Traditional Instruction treatment was meaning-oriented as it was not only mechanical drills (section 4.5.3.2), as learners received activities which required them to attend to both form and meaning to be able to complete these.

The focus of the above section was on discussing the results of the tests to answer the research questions. Apart from the results presented in numbers, it is important to make the connection between the aim of the study and the aims of the students who took part in the research. The section below focuses on the factors which could have affected the results (e.g. participants' motivation). Moreover, as students received Processing Instruction for the first time, it is also of importance to make the connection between their feedback and the general aims of the research. The questionnaire was distributed to students in the Processing Instruction Group only as they had previous experience with Traditional Instruction and they also had classes on relative clauses in a different method (Processing

Instruction). Thus, those students were able, through the questionnaire, to give feedback in relation to the English lessons they are used to and to the Processing Instruction they received during the treatment, as outlined below.

## 6.3 Students' Attitudes and Perception of Processing Instruction

### 6.3.1 Interaction between motivation and performance

As mentioned in section (1.2.3), Syrian students are motivated to learn foreign languages in general and the English language in particular. Motivation to learn English was one of the factors which affected participants' performance during the research. Of course, the effects of motivation were present, but the main effects were a result of the different instruction materials as the three groups performed differently in the consecutive tests, although most of them, if not all, were motivated to learn English.

Question one in the questionnaire supported the view related to students' motivation as all students ticked YES to the question which asked them if they were motivated to learn English or not. So, regardless of whether they were motivated to get a good job or just because they are interested in the language, motivation played a crucial role in this research. Still, in spite of the fact that all students expressed interest in learning English, their performance was different. That is, all students in the three groups were motivated to take part in the experiment, but they did not perform similarly in the consecutive tests, which supports the view that motivation had a role in the research, but the main factor was the different treatments which learners received.

Having participants with motivation to learning languages helped the research to proceed, as students with no motivation would not improve their performance regardless of the instruction they received. So, motivation was a positive point which helped in carrying out this research.

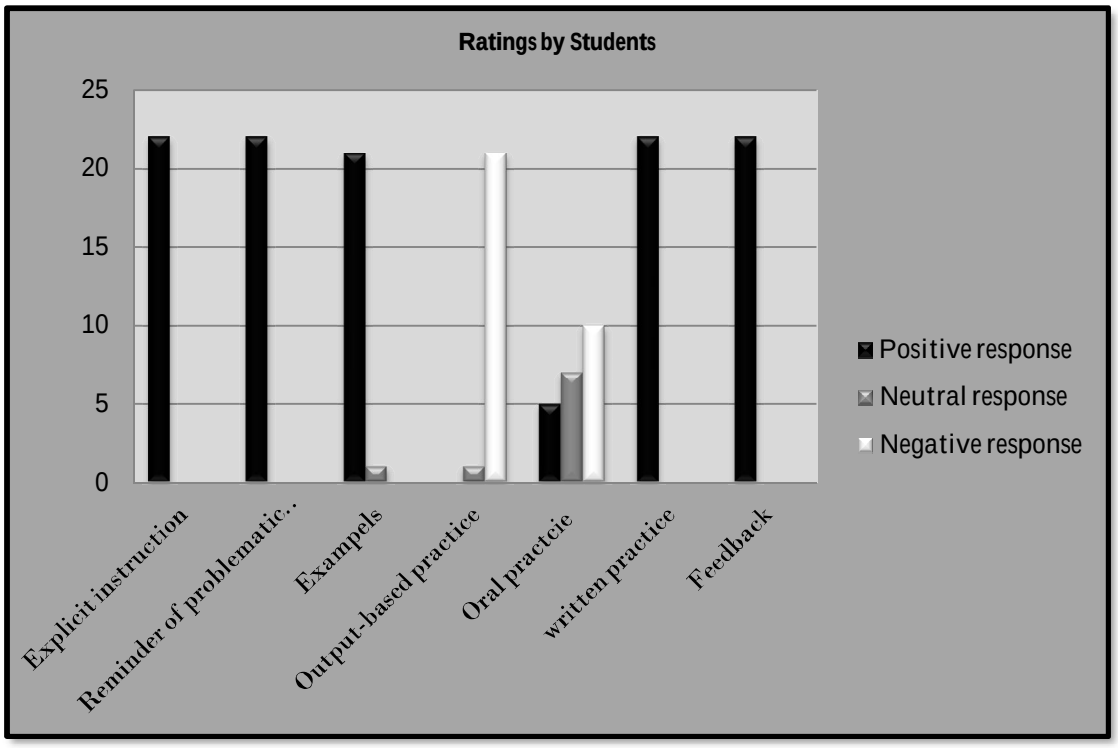
### 6.3.2 English taught in Syria and Processing Instruction

#### 6.3.2.1 Learners' views

In asking students to put different points related to teaching English in a scale of importance, they valued the role of explicit instruction, explaining the normal difficulties

Syrian students usually face in learning the target form, providing students with many examples of the targeted form after the explicit instruction, written practice, and feedback. Oral practice and urging students to practice the use of the targeted structure directly after the explicit instruction were less important to students. Figure 6.3 shows students' responses.

Figure 6.3 Students' evaluation of English lessons components.




The importance of this question was to elicit as much information from students as possible in relation to the importance of certain components of English lessons. All students valued the role of explicit explanation. Previous research in the field of Second Language Acquisition was in support of this view, as many found that explicit instruction has an effective role in the process of L2 acquisition (e.g. Doughty 1991; Ellis, 1984, 1990, 1994; Carroll & Swain, 1993). However, it seems that instruction alone is not enough and there is a role for the kind of practice students receive in classrooms. This was clear in previous literature testing Processing Instruction (e.g. VanPatten & Cadierno, 1993), including the current research, as students in the Traditional Instruction Group and Processing Instruction Group received almost the same explicit instruction. Still, the results showed that there is a statistically significant difference in learners' performance in the two groups. This is an indication that it is not only the explicit instruction that can affect

learners' performance, but also the kind of activities learners receive during treatment. For example, Structured Input Activities proved to have a positive effect on learners' processing abilities of the target grammar (e.g. Benati, 2001; Cadierno, 1995; Farley, 2001; Marsden, 2006).

Another point which was valued by participants was explaining the difficulties in acquiring the target form. This is, of course, one of different elements within VanPatten's model of instruction (1996). That is, to VanPatten (1996, 2007), during instruction, each activity should push learners from an erroneous processing strategy to a more useful one.

The third point is to provide students with many examples of the target form. Again, this is part of VanPatten's model (1996, 2007) as he encouraged using Affective Activities to enrich students' intake of the correct use of the targeted structure. One of the participants commented on affective activities, saying that, translated from Arabic, 'these activities are fun and interesting'. This can be a result of the fact that Affective Activities do not put any pressure on learners as they do not request right or wrong answers. At the same time, they are actually designed to provide the learner with examples of the correct use of the target form to which they can show an opinion.

Also of importance is the fact that students' replies were in favour of Processing Instruction in comparison with what they are used to. Maybe they are not conscious of the procedures going on during the treatment (Processing Instruction procedures and the goals of them), but answers to the questionnaire revealed a lot about students' views of how an ideal English grammar class should be to them.

Students found speaking practice and being urged to produce the form directly after instruction the least important to them. One interpretation is that students found these two points to be the least important is the fact that they are not similar to the questions that students will have in exams. In other words, to students, written practice is useful because it is similar to the questions present in the final exam, which is not the case for speaking practice as it is not of relevance when it comes to exams. Another interpretation of the participants' answers can be connected to anxiety. To produce a form learners are not ready for yet may cause anxiety (see section 2.5.6). Additionally, pushing learners to produce a form they are not ready for can also block the form from being processed. So,

following VanPatten's views in relation to input processing, only input should be manipulated so that the processing process can be facilitated.

In relation to the lessons participants had on relative clauses, question 7 in the questionnaire asked the students if the lessons were different from the ones they were used to. To students, the lessons were different and they were able to identify certain points which they found to be different from normal classes, such as the activities, attracting attention to the problems related to processing English relative clauses, the nature of the instruction materials and the use of the Arabic language. What could be of relevance to Processing Instruction is that students were positive towards doing the activities with the answer provided and, most importantly, the fact that students valued the reminder of the insufficient processing strategies usually followed by learners whose L1 is Arabic in processing English grammar. Students also found the explanation to be clearer, which could be a result of the use of Arabic in explaining difficult points and using many examples. This could also be a result of the researcher's focus during these classes on helping students to process relative clauses (one of the main aims of Processing Instruction).

Of relevance to first language transfer is question 11 of the questionnaire, as it asked students whether they think that the differences between English and Arabic relativisation systems caused any problems for them when learning English. All students were positive regarding this question and they provided in their answers to question 12 the reason for viewing the Arabic relativisation system as causing problems to them in learning English relative clauses (the non-availability of an equivalent to WHOSE in Arabic, WHOM, repeating the pronoun at the end of the sentence). These responses reveal that students are conscious of the similarities and differences between their own languages and the language they are learning.

In giving students the opportunity to talk about their ideal English lesson, they suggested using Arabic to explain English grammar rules, explaining the common errors Arab students make in the use of English relative clauses, giving as many examples as possible, giving options in any activity, and they called for more focus on discussing students' answers after each activity.

Three of the above listed suggestions (numbers two, and three and four) were part of the lesson plans for the Processing Instruction Group as outlined by VanPatten (1996). As for number one, it is one of the problematic issues in Syrian classrooms as English supervisors do not recommend English teachers use any Arabic in English classes. Although the last suggestion was recommended by VanPatten (2002) as being a mechanism which makes learners aware of the deficit in their performance, it is not part of the guidelines of Processing Instruction. Feedback is a general mechanism used in most types of instruction, as it is at this stage that students' performance is evaluated and they can ask the questions they want in relation to their answers and why they provided these answers.

#### 6.3.2.2 Why did Processing Instruction have a positive impact on participants?

This research was carried out to investigate the effects of Processing Instruction on Syrian learners' performance. Thus, the aim was not to support one treatment while neglecting another (this can be an ethical issue). The aim of the research was to try to understand how different treatments may have different effects on participants and why. Another aim is to investigate if instruction can facilitate and accelerate learning. Thus, regardless of which group outperformed the other, it was of importance in this research to understand how learners reacted to different treatments. It was also of importance to understand how teaching could be carried out without causing anxiety to learners, as the learning process should not be an effortful process. Thus, we can say that any meaning-oriented teaching can lead to learning. However, it is important to understand not only the different effects of treatments, but also what learners think about these different treatments. After all, teaching should consider what makes the learning process an interesting and fruitful one.

For the researcher, although the main source of data was numeric, information gained from the questionnaire and from participants' feedback gave more important information than those from the tests. That is, it was very important to understand how participants reacted to Processing Instruction when compared to what they were used to. This kind of information can tell us a lot about how to improve Processing Instruction. For example, learners found Affective Activities interesting and useful to them. Affective Activities are characterised by the following: do not require wrong or right answer, urge learners to understand meaning to give an opinion, enrich learners' intake by giving them different examples of the target form. These characteristics seem to have had a positive effect on

learners causing no anxiety as the answers did not require a wrong or right answer. It seems that this particular feature, *anxiety,* was spotted by Krahsen 30 years ago and deemed to be of a real importance when considering instructing a second language.

Processing Instruction is not about reducing anxiety. However, all the procedures in Processing Instruction are not overtly demanding, as it is believed that input processing should not be an effortful process, since the purpose is to facilitate learning so that learners have the time to process data, internalise data, accommodate data, and restructure data. It is then assumed that learners will have the ability to access and use data. Thus, it is a condition that the processing process should proceed with no anxiety so that the processing resources are not depleted.

Learners were not consciously aware of these sophisticated theoretical background or the procedures of Processing Instruction. However, they were aware and conscious of the differences between what they were used to (Traditional Instruction) and the type of instruction they received during treatment (Processing Instruction). All of these issues are of importance in order to understand what elements to include and what to exclude when teaching a second language.

### 6.4 Summary

The research was conducted to investigate the possible effects of Processing Instruction on improving Syrian students' processing ability of English relative clauses. It was hypothesised in this research that Processing Instruction could be an influential model for teaching English relative clauses in the context where the research was carried out. It was possible to make the connection between the findings of the tests and learners' views in relation to how to teach English grammar in Syria. Participants in the Processing Instruction Group who significantly outperformed participants in the other two groups were able to identify the elements which were helpful to them during the treatment. Most of these elements are part of VanPatten's model (1996) for instruction of second language grammar.

For the researcher, one of the important findings in the research comes from participants' feedback, where most of the participants showed positive opinions towards the teaching

they received. Participants expressed this in comments such as (translated from Arabic) ‘the activities are not difficult’, ‘the activities are interesting’, ‘the activities do not make us stressed’. All these comments reveal how, to those learners, output-based activities seem to be too demanding when performed directly after instruction. To the researcher, the learning process should not be a demanding process. Instruction should be directed towards facilitating input so that processing becomes easier.

## Chapter Seven: Summary, Contribution, and Limitations

### 7.1 Introduction

As a quasi-experimental classroom research, the researcher tried to investigate the effects of Processing Instruction on Syrian learners' processing abilities of English relative clauses. The research tried to add to previous research on Processing Instruction by testing the effects of Processing Instruction on the acquisition of a complex structure like English relative clauses by Syrian learners.

Three groups of students (66 students) in a secondary school in Damascus were involved. Instruction materials for the three groups were designed in three different ways following the peculiarities of each type of instruction. The explicit instruction was the same for the two experimental groups, with the exception related to reminding participants in the Processing Instruction Group of the problematic processing strategies usually faced by Arab learners in processing English relative clauses. After the explicit instruction, activities were Structured Input Activities for the Processing Instruction Group and Output-based for the Traditional Instruction Group. The Processing Instruction materials followed VanPatten's model guidelines (1996). The output-based instruction followed the Traditional Instruction and practice of second language grammar (see section 3.3.2 for a review of the framework of Output-based Instruction). As for the Control Group, materials did not include any explicit reference to English Relative Clauses (see section 4.5.3.3 above).

To answer the research questions, a quasi-experimental design was implemented to investigate the effects of Processing Instruction. Experimental research was the most suitable design, as the aim was to compare participants' performance before and after intervention. As a quasi-experimental design, this research faced some ethical problems. Most of the ethical considerations were adhered to in this research, excluding the one related to having a Control Group (see section 4.4.2.5). This ethical issue is usually present in experimental designs which include control groups. Some, like Norris and Ortega (2000), encouraged researchers to have control groups as comparison groups. However, others concluded that this is one of the ethical dilemmas in research (Robson, 1993). The research also concluded that the inclusion of a Control Group was necessary to measure the progress of participants in the experimental groups, leaving it to future research to find solutions to this ethical dilemma.

Evaluation of the effects of instruction was by using a direct post-test and a delayed post-test. The direct post-test was carried out directly the day after instruction. As for the delayed post-test, it was carried out four weeks after instruction to evaluate the outstanding effectiveness of instruction. The direct post-test and the delayed post-test were designed in a way to test both participants' comprehension and production of English relative clauses (see appendix 14, 15, respectively). Findings in the research supported VanPatten's claim that Processing Instruction can help learners in processing second language grammar to become part of the developing linguistic systems.

This chapter will proceed as follows: section 7.2 summarises the findings of the research. The subsequent section will shed light on the contribution of the research. This will be followed by the research limitations and suggestions for future research, ending the chapter with concluding remarks.

## 7.2 Summary of the Findings of the Research

The general findings of the research are summarised below:

- Participants in the Processing Instruction Group gained new knowledge after instruction and significantly outperformed learners in the Traditional Instruction Group and Control Group.
- In the Processing Instruction Group, learners' linguistic system developed as students were able to produce relative clauses without having had any production practice during the treatment.
- Performance of students in the Traditional Instruction Group improved after treatment, but the general results revealed that the Processing Instruction Group's performance was statistically better than this group.
- Processing Instruction is an effective model for teaching English relative clauses in the context where the research was carried out.
- The No-instruction group's performance did not improve after treatment.

The above general results will be presented below, with reference to the specific research questions investigated in the research.

### 7.2.1 Research Question 1

Would Syrian learners receiving Processing Instruction improve after instruction when it comes to the comprehension of English relative clauses?

The answer to this research question is yes, supporting the first hypothesis. Learners who received Processing Instruction improved their performance after treatment. Results from the direct post-test showed that Processing Instruction can lead to greater gains when compared to Traditional Instruction in the context where the research was carried out.

VanPatten (1996, 2007) has suggested that the essence of Processing Instruction is Structured Input Activities. This means that Structured Input Activities are more helpful to learners than output-based activities in internalising English relative clauses. This was supported by the results of the questionnaire completed by students who received Processing Instruction. Students gave priority in an English lesson to the explicit instruction and to activities which do not overtly push them towards producing the target grammar form directly after instruction (question 6 in the questionnaire). Students stated that sometimes the teacher asks them to respond to difficult activities which they are unable to answer. In addition to that, all students agreed that explaining the problematic strategies usually used by Arab learners in processing English relative clauses is of importance to them. Students expressed their views in relation to the lessons they had in the experiment as being clearer than the ones they usually receive.

The above explanation is in line with VanPatten's views (1996, 2007); VanPatten suggested that by using output-based activities after instruction, we are sometimes putting pressure on learners to produce a targeted form which they are not ready yet to produce. So, for VanPatten, the priority in grammar lessons should be on helping learners to *process* the target form, rather than pushing them to produce it prematurely.

In agreement with VanPatten's views above, it can be concluded that in the research undertaken in this thesis, in comprehending English relative clauses, applying Processing Instruction can lead to better gains when compared with Traditional Instruction.

### 7.2.2 Research Question 2

Would Syrian learners receiving Processing Instruction improve after instruction when it comes to the production of English relative clauses?

The answer to this question is yes, supporting the second hypothesis, as learners in the Processing Instruction Group have improved their performance in the direct post-test. Cohen's d showed that the effect of Processing Instruction was large when compared to learners' performance before treatment (d> .8). Results of the research showed that Processing Instruction led to greater gains than those achieved in the Traditional Instruction Group. Mean scores are as follows: Processing Instruction Group (6. 27); Traditional Instruction Group (6. 31); and Control Group (0. 13). However, statistically, the kind of improvement achieved was not significant. This means that the kind of outperformance which was present in the direct post-test could be a result of chance. To verify results, the magnitude of effect size was used and it also showed the same results. That is, Cohen's d showed that there is no difference in the magnitude of the effect of intervention between Processing Instruction and Traditional Instruction in producing English relative clauses.

One important point which should be stressed in this regard is that the Processing Instruction Group which did not receive any output-based practice performed equally with the Traditional Instruction Group which received this kind of practice. This can be attributed to the kind of changes in their developing system which enabled them to produce a structure which they had never been asked produce before.

### 7.2.3 Research Question 3

If yes, would the possible positive effects of instruction be retained equally over time by these groups?

The answer to this question is yes, which is in line with the third hypothesis. The effects of instruction were retained over time. This may indicate a real change and improvement in learners' developing system. VanPatten's model (1996) is claimed to help learners internalise new data which would therefore become part of learners' linguistic system. These retained effects over time support this claim as participants retained their knowledge over time. The three components of Processing Instruction seem to have had a real effect

on learners' linguistic system. The explicit instruction provided learners with information about the form together with a reminder of the problematic processing strategies usually followed by learners whose L1 is Arabic when processing English relative clauses. This was followed by the Structured Input Activities (both Affective and Referential), which helped learners in processing and internalising relative clauses. In the research, it seems that feedback also had a role as it enabled learners, depending on the feedback they received, to adjust wrongly processed items.

Back to the retained effects over time, results of the delayed post-test showed that in comprehending English relative clauses, participants in the Processing Instruction Group significantly outperformed the other two groups. This outperformance differs in the production of English relative clauses as the difference was not significant statistically. Similarly, the use Cohen's d calculations revealed that in comprehending English relative clauses a large effect size of intervention was observed between the Processing Instruction Group and the Tradition Instruction Group in both the direct post-test and the delayed post-test ($d > .8$). However, in producing English relative clauses, Cohen's d had shown a trivial effect size of intervention between the Processing Instruction Group and the Tradition Instruction Group in the direct post-test and a medium effect in the case of the delayed post-test ($.5 < d < .8$).

A point to be admitted is that the four-week interval may not be enough time to evaluate the effect retained over time as it can be considered as a short time. However, it was not possible to do the delayed post-test after longer than four weeks as, according to the curriculum, learners were going to study English relative clauses in term two. Therefore, it would be pointless to have the delayed test as results would be contaminated by the effects of the normal class teacher's intervention. Thus, it was only possible to have the delayed post-test four weeks after the treatments.

### 7.2.4 Research Question 4

What are the effects of Processing Instruction on Syrian learners' processing abilities?

The answer to this question is not straightforward, since it can only be revealed with reference to the answers to the three previous research questions above. The findings

indicate that Processing Instruction can change the way learners process English relative clauses. The positive impact of Processing Instruction was reflected on learners' performance in the consecutive tests. As evidence of the changes made to learners' linguistic system, participants were able to produce relative clauses correctly, displaying an understanding of Form-Meaning Connections and referential relationship between the different items in the sentence.

It seems that learners in the Processing Instruction Group did something with the input they received which was beyond what was presented to them. That is, learners in the Processing Instruction Group were never asked during the treatment to produce English relative clauses. Nevertheless, learners were able to perform the tasks which asked them to produce English relative clauses. So, while the performance of learners in the Traditional Instruction Group was affected by the activities they received (activities focused on producing English relative clauses), there seems to be another factor that helped learners in the Processing Instruction group to perform well in the production tasks. This could be the Structured Input Activities, which were designed to help learners in processing English relative clauses.

VanPatten and Oikkenon (1996) attributed the positive gains of Processing Instruction in Comprehension and Production to Structured Input Activities rather than the explicit explanation of the grammar rule. Thus, one can conclude that the Structured Input Activities in this research were responsible for the positive gains learners showed in their performance in the production tasks. So, the point is that the Structured Input Activities enabled learners in this group to improve their performance in the production tasks. The Structured Input Activities which learners in the Processing Instruction Group received affected learners' linguistic system. These kinds of effects seem to have made changes to their linguistic system, which enabled them to produce a form they have never before been asked to produce. This is, of course, in line with VanPatten (1996), who stressed the importance of input in helping learners process second language grammar.

It should be repeated in concluding this section that this does not mean that there is no role for output-based activities or communicative practice in SLA, as discussed in section 3.3.1. The point is that in processing second language grammar, focus should always be on helping learners in processing input to become part of their linguistic system, to make the

required changes which will eventually help them in using the target form. This is different from fluency as a skill in the target language. That is, the role of output-based practice and communicative practice comes after helping learners in processing input, as the role of communicative practice is to help learners in the fluency in the target language, rather than putting grammar in the head. So, for the researcher, Processing Instruction can fit well in communicative lessons where the former helps learners in processing the target form to become part of the linguistic system and the latter helps in the fluency in the target language.

### 7.3 Research Contribution

The current research is one of the few studies which investigated the effects of Processing Instruction on a non-Romance Language (see Table 3.3/ 3.4). Besides, the research is the first to investigate the effects of Processing Instruction on a complex structure such as English relative clauses. Processing English relative clauses is affected by different sources of difficulty (see section 4.5.2.4); The sentence location at on the top of the sources where sentence medial position has been shown to be difficult to process (Kuno, 1974; VanPatten, 2004b). Processing Instruction helped participants in this study in processing English relative clauses as participants in this group have significantly improved their performance after the treatment. Thus, it can be said that the current research yielded new evidence of the effectiveness of Processing Instruction as a model for instructing second language grammar.

On the theoretical level, the research contribution to the ongoing debate can be summarised as follows: (1) findings supported VanPatten's claim (1996) that altering learners' problematic processing strategies can positively affect language learning; and (2) the research contributed to the theoretical assumption of relevance to Input Processing, claiming that Processing Instruction intervenes in processing input making changes to learners' linguistic system, as the research provided evidence of the retained effectiveness of Processing Instruction.

On the pedagogical level, findings revealed some important points. The research contribution can be summarised in the following: (1) Processing Instruction facilitates and speeds up learning in a no-anxiety environment; (2) the research provided new evidence of the effectivity of Processing Instruction on a different linguistic form (English relative

clauses); and (3) the present research has the potential to make a useful contribution when it comes to teaching English grammar in Syrian schools. That is, taking into consideration the situation of public schools in Syria, the facilities available and students' level of proficiency, Processing Instruction can be a helpful tool to help learners to acquire English grammar.

The importance of what has been mentioned regarding the pedagogical implications is the fact that the research is based on a theoretical background in the field of SLA (the Input Theory). Thus, theoretically, the research supported the view that the role of input in SLA is prominent, as results showed that input-based instruction alone was able to have a large effect on Syrian learners. So, when it comes to the role of input and attention in language learning, the present research contributed results which showed support for the role of input and also attention in language learning.

In line with the new goals of teaching English in Syria (see section 1.2.2), the current research presented some useful findings regarding the change in the type of instruction Syrian students have been used to. That is to say, for decades, the focus of English textbooks in Syria was just on grammar and vocabulary, to be followed by output-based activities. However, in the last few years, with the change of textbooks, the Ministry of Education has encouraged far more focus on equipping learners with communicative skills rather than just grammar and vocabulary. Importantly, as a helpful model that can aid in the change from using the Traditional Instruction approach to the Communicative approach which teachers have to use, Processing Instruction can be used to help learners in processing the newly presented grammar forms and structures, followed communicative practice in fluency in the target language. So, due to the limited time allocated to teaching English language in Syria, Processing Instruction can be helpful to speed up learning, taking into consideration the facilities available.

In addition to the above-mentioned points, this research tried to address some of the gaps in the methodological and analytical issues. For example, previous Processing Instruction research followed certain experimental designs with justification. But, the external and internal validity of the design was absent. Previous research on Processing Instruction used the Repeated Measures ANOVA as the only measure for the effects of Processing Instruction with no justification, and without testing the assumptions of this statistical test. It is for this reason that the researcher tried to work on the assumptions and use the Effect

Size calculations to support the analysis, as using a specific test can make the analysis weak and sometimes cast doubts on the reliability of the results. In addition, we are not working in a laboratory, so it was also important for the researcher to connect the numeric results and participants' feedback. This has also been absent in previous Processing Instruction research.

The researcher tried to work on previous research limitations and improve the validity of the statistical analysis. In the current research, a parametric test, with its underlying assumptions, and Cohen's d calculations, were used for analysis. In spite of the fact that not all of the assumptions of ANOVA were met, the researcher used this test as a robust test of small deviations depending on what has been presented in statistics books and also depending on what has been presented in education research. However, to support results from the ANOVA test, Cohen's d calculations were also used. Importantly, the calculations were in line with the findings of the ANOVA test. Unfortunately, this particular area had not received any attention in previous Processing Instruction research as most of the previous research has used the ANOVA test with no reference to the assumptions underlying this test or the shape of the data in their research.

As an experimental study, there is no way that the internal and external validity can be 100% guaranteed; however, the current research still tried to work and consider the issues which can affect the validity of the research, a point which has been ignored by previous research on Processing Instruction. In addition to that, the researcher tried to achieve a balance by making a connection between the results from the tests and participants' feedback and comments.

## 7.4 Research Limitations and Suggestions for Future Research

In the current research, some limitations have to be acknowledged. This section presents limitations of this research with suggestions for future research.

### 7.4.1 Duration of the experiment

As stated above, the research was a quasi-experimental research which aimed at testing the effectiveness of Processing Instruction in a Syrian context. In the current research, the total time allocated for the treatments was roughly 6 hours 45 minutes. Each group received 2.15 hours over three consecutive days (45 minutes every day). In spite of the fact that the

duration of treatment should not affect the utility of the results, as confirmed by Norris and Ortega (2000), it would be of importance for future research to investigate the effects of this kind of treatment with longer duration if possible.

The first and most important reason for having a short experiment is to control extraneous variables which may affect the validity of results (see section 4.3.2). Another reason is the nature of Processing Instruction. That is, as a relatively newly presented type for instructing second language grammar, it cannot be applied to a whole syllabus which lasts for a term, for example. This is a result of the nature of Processing Instruction, as there are no readymade materials for this type of instruction. Thus, any interested researcher has to create the materials for this type of instruction, to include explicit instruction, a reminder of problematic strategies (this differs depending on learners' first language) and Structured Input Activities. It was not an easy task for the researcher to design the materials together with the activities and tests, as VanPatten (1996, 2007) has just posited general guidelines for this. As for the particular targeted construction, the researcher has to do the task.

Another point related to the duration of the experiment is the delayed post-test. The researcher planned to have the delayed post-test to be given to participants after a few months. This was not possible, as the researcher had her research in the last month of the first term (2009). There was no point of doing another delayed test, as participants were going to study English Relative Clauses as part of the syllabus at the beginning of second term. This meant that results could have been contaminated by intervention other than that of the researcher. Thus, it was not possible to find out if the results are maintained after a few months or not. Consequently, it is of importance to investigate the effects of Processing Instruction in follow-up tests.

### 7.4.2. Sample Size

Another limitation in the current research is the number of participants. In the current research, the number of participants was relatively small: 66 participants. This was a result of the restrictions which prevented the researcher accessing more than one school and also of the restrictions related to changing students' classes. That is, participants in the current research were $10^{th}$ grade secondary school students. There were four sections at the school where the research was carried out. According to the research set-up, only three groups were needed. So, only three sections were included and the fourth group was excluded. It

was not possible, for example, to distribute students in the fourth group in the three included groups as this was not permitted.

Also, due to having to gain permission for accessing schools in Syria, it was not possible to access more than one school in order to produce larger number of students for the research. So, at the end, the highest possible number in the current research was 66 participants. As such, it is advisable that future research include more participants in order to test the effects of Processing Instruction.

Thus, in spite of the fact that this research included a larger sample size than some of the previous research in which participants did not exceed 15 in each group (Benati, 2001; Salaberry, 1997), it is still advisable to have a larger sample size for two reasons: (1) this makes the statistics more reliable; and (2) this makes the results more generalisable. Thus, in this kind of research (quasi-experimental research), having a larger number of participants is not only important when it comes to the generalisations of results but also to strengthen the statistical tests to be used.

### 7.4.3 Assessment

Due to participants' level of proficiency in spoken English in the current research, focus was only on written tests (mostly used in the context where the research was carried out) for evaluating the effect of Processing Instruction. This can be seen as a limitation of the present research. So, it would be of importance for future research to test the effects of Processing Instruction on advanced learners to see the effects of this type of instruction on learners' spontaneous and controlled speech.

### 7.4.4 Retained Effects over Time

In the current research, the researcher examined the direct and the retained effects of instruction. The direct results may not be an indication of improvement as they can vanish after a few months, as argued by Truscott (1998). Thus, the researcher examined the delayed effects after four weeks. The researcher wanted to test the retained effects over time after a longer period. However, this was not possible as a result of the extraneous variables which could have contaminated the results. That is, the research was carried out in term one in 2009 in which learners were not yet exposed to English relative clauses,

according to the syllabus. There is no point of doing the delayed post-test in term two as learners received instruction on relative clauses in normal classes, which meant that the results would not have been objective. Thus, it was only possible to do the delayed post-test four weeks after instruction where learners were not exposed to English relative clauses in normal classes. This can be seen as a limitation of this research.

So, when possible in future research, it is of importance to examine the long-lasting effects of Processing Instruction as this can give a better insight into the real changes to learners' linguistic system.

### 7.5 Concluding Remarks

Processing Instruction has proved to be an effective model for teaching second language grammar. However, some issues still need more elaboration. VanPatten did not adhere to Form-Meaning Connection in the two types of activities within the Structured Input Activities. For VanPatten, Structured Input Activities are used to help learners in processing input so that data can be part of the linguistic system. I agree that the Referential Activities are important in helping learners to process the target grammar. The focus in Referential Activities is on helping learners to process input to become intake so that learners can make Form-Meaning Connections. However, Affective Activities do not work on this point as they are used to provide learners with examples of the target language which they can relate to their own life and experience (they fit in communicative approaches to language teaching). In other words, the problematic strategies according to which Referential Activities are designed, are absent in the case of Affective Activities.

One last point is related to the statement 'learners were never asked to produce the target form' in Processing Instruction research. In spite of the fact that the Processing Instruction treatment does not ask learners to produce the target grammar as the focus was on processing and internalising data, there is always an indirect way in which the target grammar is produced. During the Processing Instruction treatment, learners are producing the target form in reading activities in general and Affective Activities in particular. The Affective Activities require learners to read sentences so that they give an opinion or relate what they read to their own experiences in life. This is another indirect form of producing the target form. Thus, the claim that learners never produce the target form during treatment is a simplification of the issue. Besides, when learners answer the question so

that the teacher writes the correct answer on the board is another way of producing the target form.

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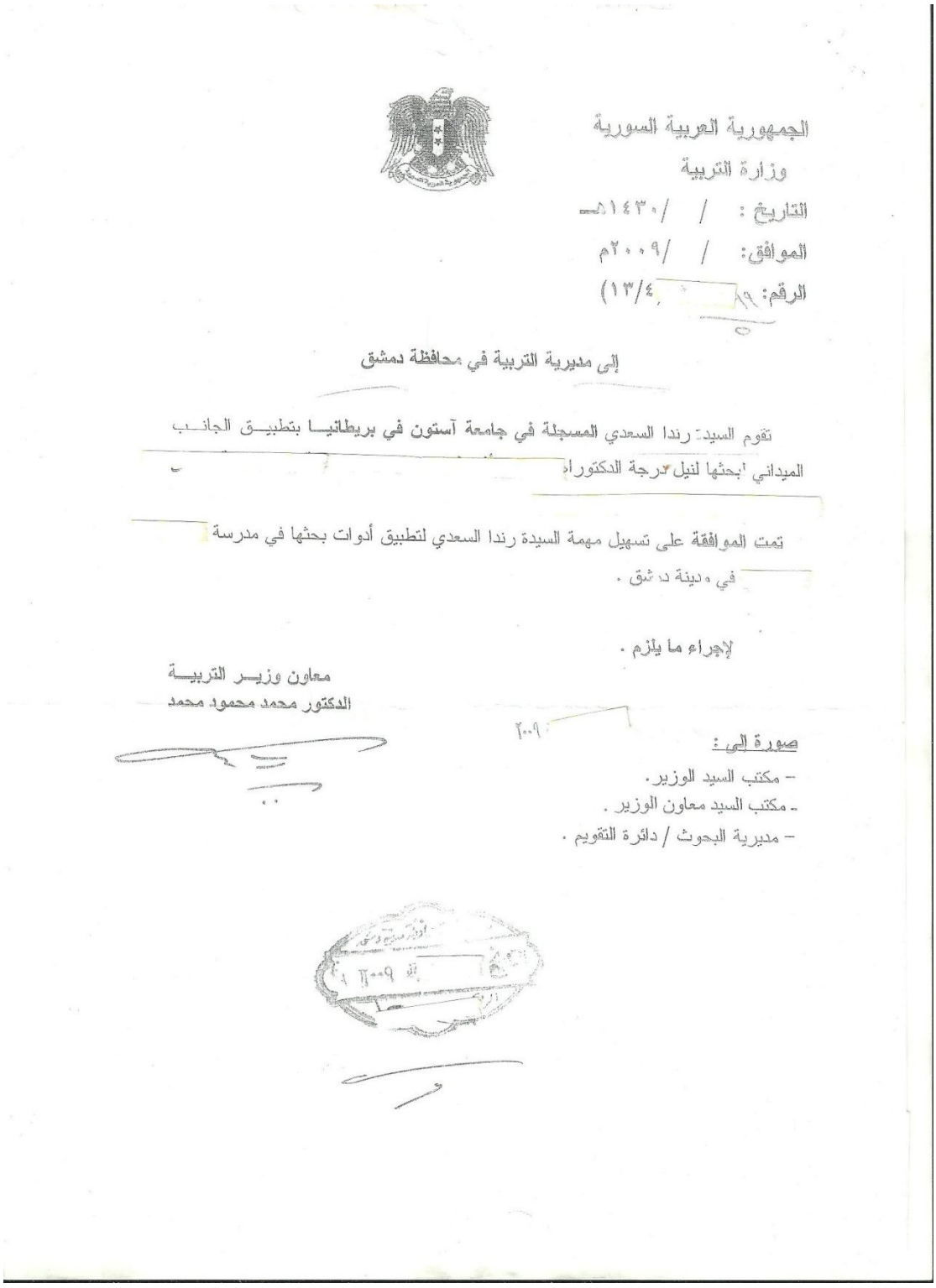
**APPENDICES**

**Appendix 1 A copy of the permission letter for accessing school (Ministry of Education).**



الجمهورية العربية السورية
وزارة التربية
التاريخ : / /١٤٣٠هـ
الموافق: / /٢٠٠٩م
الرقم: (١٣/٤

إلى مديرية التربية في محافظة دمشق

تقوم السيدة رندا السعدي المسجلة في جامعة آستون في بريطانيا بتطبيق الجانب الميداني لبحثها لنيل درجة الدكتوراه

تمت الموافقة على تسهيل مهمة السيدة رندا السعدي لتطبيق أدوات بحثها في مدرسة في مدينة دمشق .

لإجراء ما يلزم .

معاون وزير التربية
الدكتور محمد محمود محمد

٢٠٠٩

صورة الى :
- مكتب السيد الوزير .
- مكتب السيد معاون الوزير .
- مديرية البحوث / دائرة التقويم .

**Appendix 2 A translated copy of the permission document**

**Syrian Arab**

**Republic**

**Ministry of Education**

**Date.....**

**Number .....**

Education Department in Damascus Governorate

No.: (…..)

Reference to the ministerial letter NO.: …….. dated ……., you are requested to facilitate the mission of the PH.D. student Mrs. Randa Alsadi, who is registered at Aston University in the UK, to carry out her research (Effects of instruction on Syrian learners) at your school.

To take notice and act accordingly

Damascus:……

Vice-Minister of Education

Dr. Muhammad Muhammad

**Appendix 3 The consent form of the principal of the participating school**

السيدة مديرة المدرسة

**الغرض من البحث:** بحث اثار طرائق تدريس قواعد اللغة الانكليزية على الطلاب السوريين.

ولهذا الغرض فان ثلاث شعب من الصف الأول الثانوي سيكون ضمن البحث. سيستمر البحث لمدة خمسة أيام متتاليه تتضمن امتحان قبل وبعد فترة التدريس. هذا وسيتم امتحان الطلاب بعد أربعة أسابيع لبحث أثار التدريس على المدى البعيد (بالمجمل فالبحث يحتاج ل 18 حصة). انا ساقوم بتدريس كافة الحصص المخصصة للبحث. وهناك ايضا استبيان سيجيب عليه الطلاب في في احدى الشعب ليقدمو رأيهم بالتدريس الذي تلقوه خلال البحث.

سيتم تسجيل الحصص والاحتفاظ ببعض الملاحظات لضرورات البحث فقط.

**عدم الكشف عن هوية المشاركين واسم المدرسة**

سيتم التعامل مع كافة المعلومات التي سيتم جمعها بسرية تامة. لا أحدسيعرف اسماء الطلاب-او المدرسة باستثناء الباحثة.

في حال قررتم الموافقة على طلبي أرجو قراءة وتوقيع الطلب المرفق في الأسفل.

ولكم جزيل الشكر

رندا السعدي

---

لقد قمت بقراءة الشرح المتعلق بالبحث العلمي للطالبة رندا. وكانت الفرصة متاحة لي لمناقشة الأسئلة التي أرغب بطرحها و المتعلقة ببحثها.

أنا على علم بأن البحث سيكون بنفس الوقت المخصص لحصص اللغة الانكليزية وان الباحثة قد تسجل هذه الحصص وتحتفظ بمذكرة تحوي مايجري في هذه الحصص لأغراض تتعلق بتحليل المعلومات في بحثها. وقد اعلمتنا المدرسه برغبتها بان تقوم باستبيان بعد التدريس.

أنا على علم ايضا بأن التجربة قد تستمر لخمس أيام متواصلة وأن امتحان ثالث سوف يتم بعد خمس أسابيع من البحث.

وقد أكدت الباحثة على ان اسم المدرسة وأسماء الطلاب المشاركين في البحث سوف لن تكون عرضه للكشف تحت أي ظرف.

أوافق على طلب الطالبة رندا السعدي لمباشرة تجربتها في مدرستنا.

التوقيع: _____ الاسم: _____

الاميل ان وجد: _____

**Appendix 4 A translated copy of the consent form signed by the principal of the participating school**

**Consent Form**

**Dear Madam,**

I am working on a research related to the effects of instruction on Syrian learners' acquisition of English grammar. Below is a summary of the research:

**Purpose of the Research:** Testing the effects of different instruction treatments on students' performance.

Three sections of first secondary school students would be involved in the research. The research will last for five consecutive days to be followed after four weeks by a test (18 classes are needed). All the classes will be taught by me. Students in one of the groups will answer a questionnaire related to the treatment students will receive.

Students in the three groups will take three short tests to test the effects of instruction on students' performance. The tests and the questionnaire are for research purposes only.

Ethnographic data will be collected in the form of recordings and field notes.

**Confidentiality and anonymity**:

All of the information I collect will be treated confidentially. No one apart from the researcher will know the students' names/ the school name.

If you accept my request, please read and sign the form below.

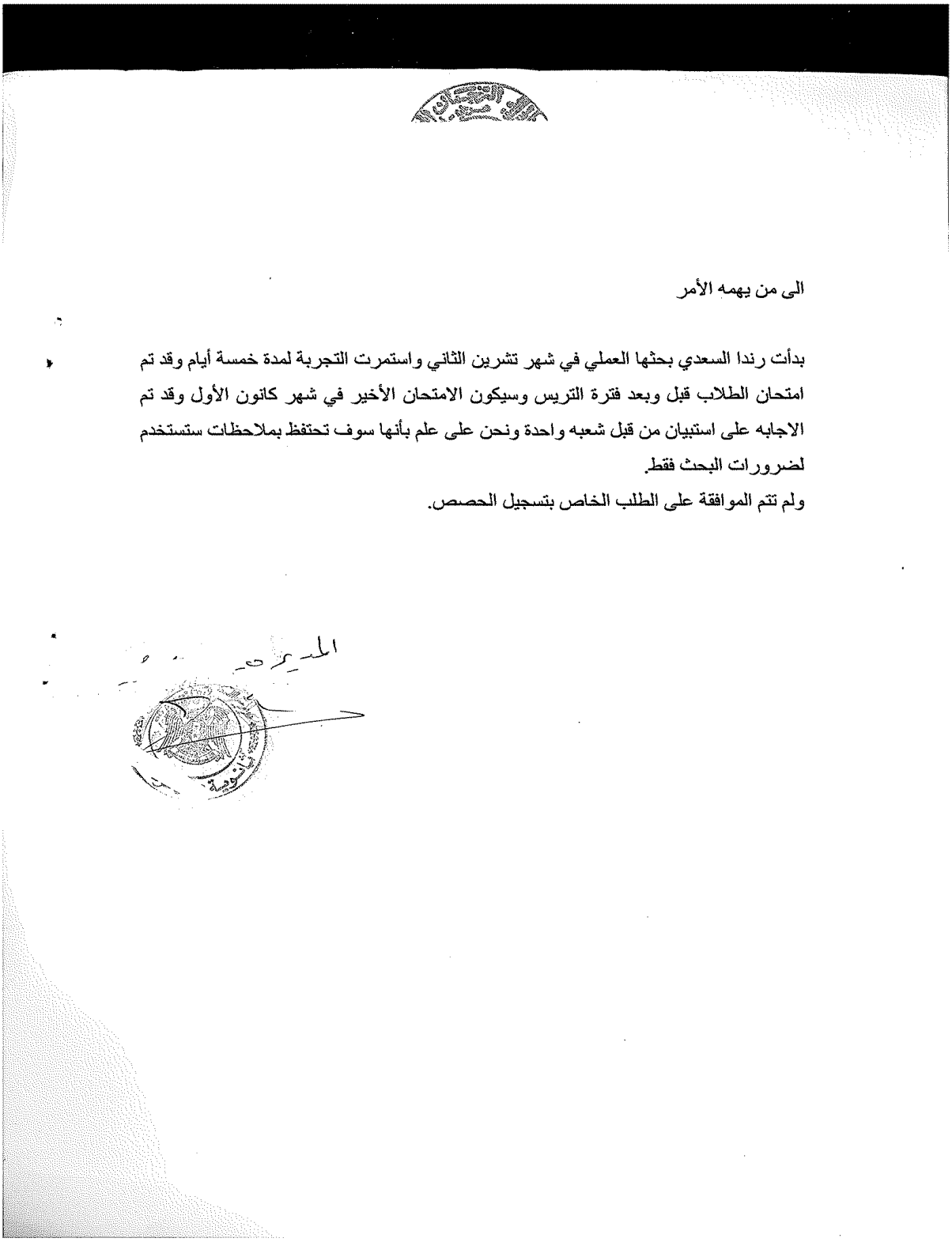
Regards
Randa Alsadi

_____

I have read the description of the research project. I have had the opportunity to discuss it with the researcher and ask any questions I have.
I understand that the research will be conducted in the time of normal classes, and the researcher may record her classes and keep a diary for research purposes only. I know that a questionnaire will be completed by the students after instruction.
I know that the research will last for five consecutive days to be followed after four weeks by a test (18 classes are needed).

I understand from the researcher that the name of the school and students' names will be kept in confidence and that their identities will not be revealed.
I agree on the researcher's request to conduct her study in our school.
Signature _____ Name _____

## Appendix 5 Principal' s letter rejecting the recording request



الى من يهمه الأمر

بدأت رندا السعدي بحثها العملي في شهر تشرين الثاني واستمرت التجربة لمدة خمسة أيام وقد تم امتحان الطلاب قبل وبعد فترة التريس وسيكون الامتحان الأخير في شهر كانون الأول وقد تم الاجابه على استبيان من قبل شعبه واحدة ونحن على علم بأنها سوف تحتفظ بملاحظات ستستخدم لضرورات البحث فقط.

ولم تتم الموافقة على الطلب الخاص بتسجيل الحصص.

**Appendix 6 Translated Version of the Principal's letter rejecting the recording request**

To whom it may concern

This is to certify that Mrs. Randa Alsadi has started her research in November. The students were examined before and after the teaching period. A questionnaire was answered by one section.

Approval of the special request for recording classes was rejected.

Principal name

School name

Stamp/ Signature

## Appendix 7 Participants' consent form

**استمارة موافقة الطالب**

عزيزي الطالب

سأقوم بتدريسكم مادة اللغة الانكليزية لمدة ثلاث أيام وسوف يسبق هذا بامتحان ويتبع بامتحانين لتقييم اثر التدريس على مستواكم. بالاضافة الى هذا سيجيب بعض الطلاب احد هذه الشعب على استبيان ذي صلة بالدروس التي تلقوها خلال البحث. أود ان اعلمكم انني سوف اسجل هذه الحصص وساحتفظ بمذكرة تحوي ملخص عما يحدث في هذه الجلسات.

**عدم الكشف عن اسماء الطلاب المشاركين**

لن يتم الكشف عن اي اسم من اسماء الطلاب المشاركين. ولن يعرف أحد باسماء الطلبة باستثناء المدرسة.

فان كنت موافق على المشاركة في هذه الحصص أرجو تقرأ الستمارة في الاسفل والتوقيع علما بانكي تستطيعين الانسحاب من البحث باي وقت دون تقديم أسباب.

شاكرين تعاونكم

رندا السعدي

---

لقد فهمت الهدف من هذه الحصص. وكانت الفرصة متاحة لي لمناقشة الأسئلة التي أرغب بطرحها.

أنا على علم بان المدرسة قد تسجل هذه الحصص وتحتفظ بمذكرة تحوي مايجري في هذه الحصص.

أنا على علم ايضا بأن التجربة قد تستمر لخمس أيام متواصلة وأنني سأشارك بثلاث امتحانات وانني قد أجيب على استبيان بعد انتهاء الحصص.

وقد أكدت المعلمة على ان اسمي سوف لن يكون عرضه للكشف تحت أي ظرف.

أوافق على طلب المدرسة وأوافق على مشاركة في هذا البحث.

التوقيع: _____

الاسم: _____

الاميل ان وجد: _____

**Appendix 8 A translated version of participants' consent form**

**Consent to participate in Research**

Dear student,

I am a teacher of English and I am doing some research about how to teach English effectively. I am going to teach you English for three consecutive days. You will be tested before and after instruction. You will be asked also to answer some activities during the instruction period (some of you will answer a questionnaire after instruction).

**Confidentiality:**

All of the information you give to me will be treated confidentially. No one apart from the researcher will know your name/ the school name.

If you decide to participate, please read the form below carefully and sign it in the space provided. If at any point you change your mind and no longer want to participate, you can stop without giving reasons.

Thank you for your cooperation

Randa Alsadi

_____

I understand the aims of instruction. I have had the opportunity to ask any questions I have. I understand that I will be asked to take part in some activities, and that I will be tested before and after instruction. Besides, I understand that I may complete a questionnaire. I know that the teacher will record the classes and keep a diary. I understand that my name/ the school name will be kept anonymous.

I agree to take part in the study. I understand that I may withdraw from the study at any time, for whatever reason, and if I do, I will inform the teacher.

Signature _____ Date _____

## Appendix 9 Parents' consent form

**استمارة موافقة أولياء الامور**

السيد ولي أمر الطالب-ة ..... المحترم:

أنا طالبة حاليا أقوم بعمل بحث عن اثار طرق التدريس على طلاب المدرسة الثانوية فيما يتعلق بتعلم قواعد اللغة الانكليزية. ولهذا فأنا ارغب بالقيام بهذا البحث في مدرسة ابنتكم لبحث كيف يمكن لطريقة تدريس محدده ان تكون اكثر ايجابيه من اخرى على طلاب المدارس الثانوية. سيستمر البحث لمدة ثلاث حصص وسيسبق بامتحان واحد ويتبع بامتحانين. وسأقوم باستطلاع بعد التدريس وستشارك ابنتكم في هذا الاستطلاع المتعلق بطريقة التدريس. أرغب باعلامكم بانني سوف اسجل هذه الحصص وسأحتفظ بمذكره لاسباب تتعلق ببحثي.

**السرية وعدم الكشف عن هوية الطلاب واسم المدرسة**

سيتم التعامل مع كافة المعلومات التي سيتم جمعها بسرية تامة. لا أحدسيعرف اسماء الطلاب-او المدرسة باستثناء المدرسة.

ولهذا أرجو منكم الموافقة على مشاركة ولدكم- ابنتكم في هذه التجربة.

شاكرين حسن تعاونكم

رندا السعدي

_____

لقد قمت بقراءة الشرح المتعلق بالبحث العلمي للمدرسة رندا. وكانت الفرصة متاحة لي لمناقشة الأسئلة التي أرغب بطرحها و المتعلقة ببحثها.

أنا على علم بأن الباحثة قد تسجل هذه الحصص وتحتفظ بمذكرة تحوي مايجري في هذه الحصص لأغراض تتعلق ببحثها.

أنا على علم ايضا بأن التجربة قد تستمر لخمس أيام متواصلة وأن امتحان ثالث سوف يتم بعد خمس أسابيع من البحث. بالاضافة لذلك انا على علم بأن المدرسة ستقوم باستبيان وستشارك ابنتي في هذا الاستبيان.

وقد أكدت المدرسة على ان اسم المدرسة واسم ابنتي المشاركة في البحث سوف لن تكون عرضه للكشف تحت أي ظرف.

أوافق على طلب المدرسة رندا السعدي وأوافق على مشاركة ابنتي في هذا البحث.

التوقيع: _____

الاسم: _____

الاميل ان وجد: _____

**Appendix 10 Translated version of Parents' consent form**

**Introduction**:
I am working on a research related to the effects of instruction on Syrian learners' acquisition of English grammar. I am conducting a research in your daughter's school to test the effects of instruction.

I need permission from you for your daughter to participate in the research which will last for five consecutive days. Your daughter will be tested before and after instruction to measure her improvements. Your daughter will answer a questionnaire related to teaching English language in general and to the instruction she will receive in particular.
I will record my classes and keep a diary for research purposes only.

**Confidentiality:**
All of the information your daughter give to me will be treated confidentially. No one apart from the researcher will know your daughter's name/ the school name.
If you accept my request, please read the form below and sign it in the space provided.

Thank you
Randa Alsadi

---

I have read the description of the research project to be carried out by the teacher. I have had the opportunity to discuss it with her and ask any questions I have.

I understand that the research will record her classes and keep a diary for research purposes. Besides, I know that my daughter will participate in a survey related to the instruction they receive. I also know that the experiment will last for five consecutive days then a delayed test will be after four weeks.

I understand from the researcher that the name of the school and my daughter's name will be kept in confidence and that their identities will not be revealed.

I accept that my daughter will be a participant in her study.

Signature _____ Date _____

## Appendix 11 Structured Input Activities

### Activity 1

**1. Choose the relative pronoun (who, whom, or which) which can best substitute (THAT).**

**E.g. I met the teacher THAT you talked with.**

**a) who** **<u>b) whom</u>** **c) which**

1. This is the book THAT she recommended.

a) who b) whom c) which

2. I know the girl THAT lives next to your flat.

a) who b) whom c) which

3. I have read the book THAT our teacher talked about.

a) who b) whom c) which

4. I know the girl THAT the teacher talked about.

a) who b) whom c) which

5. I know the girl THAT you met at the party.

a) who b) whom c) which

6. I know the shop THAT you gave the journal to.

a) who b) whom c) which

7. Do you know the girl THAT showed you the way?

a) who b) whom c) which

## Activity 2

Teacher's sheet

Listen to the teacher saying some Arabic sentences.

Choose either (a) or (b) as the best translation.

E.g أقصد القصر الذي زواره من السياح

1.قابلت المعلمة التي اجتازت ابنتها كل امتحاناتها

2. انا اخذت الكتاب ذي الغلاف الممزق

3. انا اعرف الفتاة التي تدرس امها في مدرستنا

4. رأيت الرجل الذي أخذ المفاتيح وهرب.

5.قابلت طالبا اضاع مفاتيحة بالامس

6.هي رأت الرجل الذي اخته جارتكم

**Students' sheet**

a) I mean the palace whose visitors are mainly tourists.

b) I mean the palace which its visitors are mainly tourists.

1. a) I met the teacher who her daughter passed all her exams.

   b) I met the teacher whose daughter passed all her exams.

2. a) I took the book which its cover was torn

   b) I took the book whose cover was torn.

3. a) I know the girl whose mother teaches in our school.

   b) I know the girl who her mother teaches in our school.

4. a) I saw the man which took the keys and ran out quickly.

   b) I saw the man who took the keys and ran out quickly.

5. a) I met a student who lost his watch yesterday.

   b) I met a student which lost his watch yesterday.

6. a) She saw the man who his sister is your neighbour.

   b) She saw the man whose sister is your neighbour

**Activity 3**

**Cross out the noun phrase/pronoun which should be substituted by a relative pronoun. Then, choose either a, b, c, or d to substitute that noun. Write the relative pronoun you choose in the space provided then write down the full sentence.**

E.g. I know the book which – You mentioned ~~the book~~.

a) to which b) to whom c) which d) for which

I know the book which you mentioned

1) I saw the man ……. – you talked with him.

a) whom b) who c) whose d) which

……

2) The girl is my classmate …… – You met her at the party yesterday.

a) who b) which c) whom d) who she

……

3) I know the teacher……. – He teaches Science in your school.

a) whom b) which c) who d) whose

……

4) The man is working in a job agency…….. _ I gave the book to the man.

a) who b) which c) whom d) whose

……

5) The woman is from China……. – Bill is looking for the woman.

a) whom b) who c) which d) to whom

……

6) The teacher is very kind……. – Her car was stolen yesterday.

a) who her b) who c) whose d) whom

……

**Activity 4**

**Underline the relative pronoun which should be used to complete the following sentences. The antecedent (head noun) is the same for all the sentences.**

**Head noun: YOUR FRIEND**

**E.g. ….. who/<u>whom</u>/whose/which you talked to in the party yesterday is a genius.**

1. …… who/whom/whose/which book was stolen yesterday

2. …… who/whom/whose/which got the prize last year.

3. …… who/whom/whose/which you study with.

4. …… who/whom/whose/which sister graduated last year.

5. …… who/whom/whose/which we talked about yesterday.

6. …… who/whom/whose/which wants to be a doctor.

## Activity 5

**Teacher's Sheet**

**Listen to the teacher saying the first part of an English sentence.**

**Choose either a) or b) to complete the teacher' statement**

Teacher's statements:

1. The book
2. I know the man
3. The teacher
4. The bird
5. I saw the professor
6. I found the ring

**Students' sheet**

a) The book which you ordered last week is ready for collection.

B) The book who you ordered last week is ready for collection.

a) I know the man who his son is a well-known engineer.

B) I know the man whose son is a well-known engineer.

a) The teacher who her car was stolen yesterday is sad.

b) The teacher whose car was stolen yesterday is sad.

a) The bird who is in the nest is colourful

b) The bird which is in the nest is colourful

a) I saw the professor who taught me last year.

B) I saw the professor which taught me last year.

a) I found the ring which my sister bought last week

b) I found the ring who my sister bought last week

**Affective activity 1**

Listen to the teacher making a series of statements. Decide whether you agree or disagree with the following statements by underlying either (AGREE) or (DISAGREE) *(notice the use of relative clauses in each sentence).*

| | **Agree** | **Disagree** |
|---|---|---|
| 1. Pupils who use mobile phones in classrooms should be punished. | …… | …… |
| 2. A person who borrows money from others and do not pay it back should not be trusted. | ……. | …… |
| 3. The lesson which the teacher taught today is not clear. | ……. | ……... |
| 4. Shops which sell Cigarettes to teenagers should be closed. | ……. | ……... |
| 5. The teacher who is teaching us English relative pronouns is not kind. | ……. | ……. |
| 6. A teacher who is always shouting should not teach us. | …….. | ……... |
| 7. You do not like going to the restaurant which is near our school. | …… | ……... |
| 8. People whose houses were damaged in the flood should receive partial compensations from the government. | ……. | ……... |

Check if your friend gave the same answer.

**Affective Activity 2**

Read the following statements. These are some commands in which the speaker uses relative clauses. To whom do you expect each command is told.

1. Give Rosie the red book which is beside the black one.

   a) Mother to her child. b) Teacher to a student.

2. Put the glass on the table which is in the middle of the room.

   a) A father talking to his child. b) A child talking to his father.

3. Hand the book to the student who is standing by the door.

   a) a mother talking to her child. b) A student talking to her teacher.

4. Read the poem which is on page 83.

   a) Your neighbour talking to you. b) A teacher talking to students.

5. Speak to the teacher whom you gave the report to.

   a) Friends talking to each other. b) a principal talking to a student

6. Give support to people whose houses were affected by the earthquake.

   a) A government ordering people. b) a preacher talking to people.

Check your answers with the student next to you, and see if you have the same letter checked.

**Affective Activity 3**

**Read the following sentences. Check whether you have been involved in these things before or not by underlying either YES or NO.**

1. You felt sorry for the girl who failed her exam.
   a) yes b) no
2. The teacher who teaches you Maths was not happy about your exam results.
   a) yes b) no
3. You help people who ask for free help.
   a) yes b) no
4. You looked after a child whose mother was sick.
   a) yes b) no

5 Your neighbour whom you met in the morning shouted at you.
   a) yes b) no

Check your answers with the student next to you, and see if you have the same responses.

**Appendix 12 Output-based activities**

**Fill in the blanks using the correct relative pronoun (who, whom, which, or whose).**

**E.g. I met the teacher whom you talked with.**

1. This is the book ……. she recommended.

2. I know the girl …….. lives next to your flat.

3. I have read the book …… the teacher has recommended.

4. I know the girl …….. the teacher talked about.

5. I know the girl ……. you met at the party last night.

6. I know the shop ……. you gave the journal to.

7. Do you know the girl ……. showed you the way?

**Activity 2**

**Listen to the teacher saying incomplete sentences.**

**Work with a partner and try to complete the sentences using relative clauses.**

**Write down the sentences you agree on to discuss with the teacher**

1. I met the teacher ……..……....

3. I took the book …….....

4. I know the girl ……..

5. I mean the palace …….…….....

6. Could you please tell me ……..……..

4) A book ……..

5). The house ……..

6) The thief ……..……..

7) The teacher ……..

8) She saw Tom ……..

9) I found the ring ……..

10). The bird ……..

11) I met a woman ……..

**Activity 3**

**Read the following sentences. Work with a partner and complete the sentences using the correct relative pronoun (who, whom, which, or whose) and the words below each sentence.**

**e.g.** The teacher WHO teaches us science is kind.

science/ us/ teaches

1.The teacher ……. is sad.

Was/stolen/car/

2. A person ……. should not be respected.

Of/steels/the/others/property/

3. I do not like the cheese sandwich ……..

Is/ sold/ in/ school/ our

4. I do not like the teacher ……..

Shouting/ always/ is/

5. I do not like going to the restaurant ……...

Is/ school/ near/ our

6. Shops …… should be closed.

Sell/teenagers/cigarettes/to

**Activity 4**

**Decide whether each of the following sentences is correct or not by underlying either the word (yes or no).**
**If the relative pronoun used is incorrect, rewrite the sentence using the correct form in the space provided.**

E.g. I know the film whom you mentioned. YES/NO
I know the film which you mentioned.

1. The report contains statements whose factual truth is doubtful. Yes/No
……..

2) I am talking about the girl who her hair is covering her face. Yes/No
……

3) A thief is a person which takes the property of others without permission. Yes/ No
……

4) A book which its pages are not complete should not be bought. Yes/No
……

5) The book whose cover is torn is not mine. Yes/No
……

6 The thief which stole the book ran out quickly Yes/No
……..

**Activity 5**

**Join each pairs of sentences below using relative clauses.**

E.g. I know the book. – You mentioned the book.

I know the book which you mentioned.

1) The man is my neighbour. – You talked with him.

……

2) The girl is my classmate – You met her at the party yesterday.

……..

3) I know the teacher. – He teaches Science in your school.

……

4) The man is working in a job agency. _ I gave the book to the man.

……

5) The woman is from China. – Bill is looking for the woman.

……..

6) The teacher is very sad. – Her car was stolen yesterday.

……

**Activity 6**

**Listen to your partner saying some statements.**

**Try to judge if the Relative Pronoun is used correctly or not in each statement.**

**If the Relative Pronoun is used incorrectly, write the correct form (who, whom, which, or whose) in the space provided.**

1. People who disobey the law should be punished.

……..……..

2. The girl who I study with is always complaining.

…….

3. The books whose the school gave to me are torn.

…….

4. A student who his marks are good should be given a prize.

…….…….

5. People whose houses were damaged in the flood are given new houses by the government.

……

6. The teacher whom teaches us English is from Egypt.

……..…….

7) The report contains statements who factual truth is doubtful.

……..

8) I am talking about the girl who her hair is covering her face.

……

9) The thief which stole the book ran out quickly.

……

10) The teacher who teaches us Maths is from Egypt.

……

**Appendix 13 The pre-test**

**Choose the relative pronoun which can best substitute (THAT) in the following sentences.**

1. Focus on the question THAT your brother raised.

a) who b) whom c) which

2. They ignored the suggestion THAT Kim made.

a) who b) whom c) which

3. This is the girl THAT he wants to live with.

a) who b) whom c) which

4. Bill likes the girl THAT you gave the book to.

a) who b) whom c) which

5. I know the girl THAT you met at the party yesterday.

a) who b) whom c) which

**2. A) Cross out the noun phrase/pronoun which should be substituted by a relative pronoun.**
**B) Then, choose either a, b, c, or d to substitute that noun (write the relative pronoun which you choose in the space).**

1) I saw the boy …….. – The boy kissed Mary.

a) Whom b) Who c) Whose d) which

2) I saw the boy ……. – Mary kissed him.

a) Who b) Which c) Whom d) Who she

3) I know the girl ……..... – Her mother is a teacher.

a) Whom b) Which c) Who d) Whose

4) I looked for the article ……. – Bill wrote it.

a) Who b) Which c) Whom d) Whose

5) I met the woman ……. – Bill is looking for the woman.

a) Whom b) Who c) Which d) To whom

**3. Complete each sentence using a relative clause (use the prompts below):**

1. The teacher congratulated the student ……...
2. I know the man ……..
3. I want the book …….
4. I know the lady ……..
5. I know the teacher …….

_____

**Prompts**

1. He passed all his exams.
2. You met him in the conference.
3. It is on the table.
4. Her son graduated last year.
5. You gave the book to her.

**4. Join the following sentences using the correct relative pronoun.**

1) The man is my cousin. – He works in this office.

The man ……..

2) The girl is my classmate. – You gave the book to her.

The girl ……..

3) The lady is my sister. – You met her at the party.

The lady ……..

4) I know the place. – You spoke about it.

I know the place ……..

5) The woman is from China. – Her car was stolen yesterday.

The woman ……..

**Appencix 14 The direct post-test**

**1. Choose the relative pronoun which can best substitute (THAT) in the following sentences.**

1. Focus on the question THAT your brother raised.

a) Who b) whom c) which

2. They ignored the suggestion THAT Kim made.

a) Who b) whom c) which

3. This is the girl THAT he wants to live with.

a) Who b) whom c) which

4. Bill likes the girl THAT you gave the book to.

a) Who b) whom c) which

5. I know the girl THAT you met in the party yesterday.

a) Who b) whom c) which

**2. Cross out the noun phrase/pronoun which should be substituted by a relative pronoun.**

**Then, choose either a, b, c, or d to substitute that noun to be placed in the provided space.**

1) I saw the boy …….. – The boy kissed Mary.

a) Whom b) Who c) Whose d) which

2) I saw the boy …….. – Mary kissed him.

a) Who b) Which c) Whom d) Who she

3) I know the girl ……..... – Her mother is a teacher.

a) Whom b) Which c) Who d) Whose

4) I looked for the article …….. – Bill wrote it.

a) Who b) Which c) Whom d) Whose

5) I met the woman …….. – Bill is looking for the woman.

a) Whom b) Who c) Which d) To whom

**3.Complete each sentence using a relative pronoun (use the prompts below):**

1. The teacher congratulated the student ……..
2. I know the man ……..
3. I want the book ……
4. I know the lady ……..
5. I know the teacher ……

**Prompts**

1. He passed all his exams.
2. You met him in the conference.
3. It is on the table.
4. Her son graduated last year.
5. You gave the book to her.

**4. Join the following sentences using the correct relative pronoun.**

1) The man is my cousin. – He works in this office.

The man ……

2) The girl is my classmate. – You gave the book to her.

The girl ……

3) The lady is my sister. – You met her in the party.

The lady ……

4) I know the place. – You spoke about it.

I know the place ……

5) The woman is from China – Her car was stolen yesterday.

The woman ……

**Appendix 15 The delayed post-test**

**1. Choose the relative pronoun which can best substitute (THAT) in the following sentences.**

1. I know the man THAT you gave the journal to.

a) Who b) whom c) which

2. They gave the prize to the girl THAT spoke first.

a) Who b) whom c) which

3. He'll be glad to take the toys THAT you don't want.

a) Who b) whom c) which

4. This is the letter THAT drew our attention to the problem.

a) Who b) whom c) which

5. I accepted the advice THAT my neighbour gave me.

a) Who b) whom c) which

**2. A) Cross out the noun phrase/pronoun which should be substituted by a relative pronoun.**
**B) Then, choose either a, b, c, or d to substitute that noun to be placed in the provided space.**

1) The teacher is very kind ……. – Her car was stolen yesterday.
a) Who her b) Who c) Whose d) Whom

2) I thought about the boy …….. – The boy was absent.
a) Who her b) Who c) Whose d) Whom

3) I saw the girl …….. – The girl was sick.
a) Who her b) Who c) Whose d) Whom

4) I saw the boat …….. – He is building a boat.
a) Whom b) Who c) Which d) To whom

5) I know the girl …….. – Her bag was stolen yesterday.
a) Who her b) Who c) Whose d) Whom

**3. Join the following sentences using the correct relative pronoun.**

1) The teacher is very kind. – Her car was stolen yesterday.

The teacher ……

2) I know the man. – You mentioned him.

I know the man ……

3) The place is Denver. – You spoke about the place.

The place .....……..

4) The man is over here. – I gave the book to him.

The man ……

5) I know the girl. – She speaks French.

I know the girl ……

**4. Complete each sentence using a relative pronoun (use the prompts below):**

1. I met the girl ……
2. The student …… is crying
3. Mind the table ……..
4. The person …… is a doctor
5. This is the woman ……

**Prompts**

1. she speaks four languages.
2. She failed the exam.
3. The baby crawled under the table.
4. He spoke to the person.
5. you met her girl in the morning.

**Appendix 16 Control Group Instrcution Materials**

**A Pre-reading matching activity**

| | |
|---|---|
| **1. a big majority** | a. to make something less strong of forceful |
| **2. to pass laws** | b. here, to let certain bars and clubs ignore the smoking ban |
| **3. to water down** | c. most people |
| **4. a proposed smoking ban** | d. to become legal, to become one of the rules used to govern the country |
| **5. second hand smoke** | e. pretend to be like places where only a selected few people can go |
| **6. to make an exception** | f. the air (smoke) that people breathe out when using (smoking) a cigarette |
| **7. the parliamentary health committee** | g. a group of people elected to give advice to Government on certain subjects |
| **8. nominally private clubs** | h. to formally agree or approve new rules (for governing a country) |
| **9. in its final form** | i. a plan to stop using cigarettes |
| **10. to come into force** | j. in the last version, the version that will be used by everyone |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**Activity 2**

**Are the following statements true or false? Read the text again and circle the correct answer:**

| | | |
|---|---|---|
| 1 | There are a lot more Labour MPs than MPs from other parties. | **T / F** |
| 2 | Some Labour MPs have tried to make laws on identity cards less strict | **T / F** |
| 3 | People who work in indoor public places have to breathe in the smoke that smokers breathe out. | **T / F** |
| 4 | The government wants the non-smoking law to apply to private members' clubs. | **T / F** |
| 5 | People against the government's proposals think that some bars might become genuine private clubs. | **T / F** |
| 6 | The early stages of the law will be discussed in the middle of the next year. | **T / F** |

**Activity 3**

Answer the following questions

1. How would you summarise the topic of the text?
2. How would define the term smoking ban?
3. What does the writer mean by second hand smoke?
4. Do you think that smoking ban law should come into force in all countries? Why?

**Day 2: The New Seven Wonders**

**Pre-reading activity**

**Match these words and phrases to their definitions.**

| | |
|---|---|
| 1. **poll** | A. ignored and rejected |
| 2. **random order** | B idea or plan (usually new) |
| 3. **glitzy** | C. survey, vote, election |
| 4. **visible** | D. unpredictable sequence with no pattern |
| 5. **made the cut** | E. assigned, thought of |
| 6. **compatriots** | F. can be seen |
| 7. **drew up** | G. fellow countrymen/women |
| 8. **honorary** | H. survived the voting to reach the final few |
| 9. **shunned** | I. glamorous and expensive |
| 10. **initiative** | J. Special - no need to go through the official process |


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**During reading activity**

1. How were the new Wonders chosen?
2. Where are the new Wonders?
3. What does Egypt think about the new Wonders?

The answers are:

1 – The Wonders were chosen through a global poll, where people voted online, by telephone and text messages. (paragraph 1).

2 – The new Wonders are all over the world – China, Jordan, Brazil, Mexico, Peru, Rome and India (paragraph 2)

3 – 'Egyptian officials shunned the whole initiative anyway as too commercial' (para

**COMPREHENSION QUESTIONS**

| **Are the following sentences true or false?** | |
|---|---|
| 1. There were more than 100,000,000 votes | T/F |
| 2. The New Wonders were announced in London. | T/F |
| 3. Petra is an ancient wooden city in Jordan. | T/F |
| 4. There are three Wonders from the Americas. | T/F |
| 5. Antipater of Sidon was the architect who built the Colosseum in Rome. | T/F |
| 6. The organiser wants to have another poll for natural Wonders. | T/F |

1. True – paragraph 1 of the written text says, 'a hundred million votes…'
2. False – paragraph 2 says '..glitzy ceremony in **Lisbon**' Portugal's capital.
3. False – paragraph 2 says 'Petra, the **stone-carved** ancient city in Jordan'

4. True – paragraph 2 says ' Rio de Janeiro's Statue…made the cut….there were two other winners from the Americas'
5. False – In paragraph 2, the author says, that the 'Machu Piccu in Peru and Chichen Itza in Mexico – unknown to Antipater of Sidon, the **Greek writer** who drew up the original list of wonders'.
6. True – paragraph 3 says 'the Swiss organiser, Bernard Weer announced his next initiative, a global poll on the seven natural wonders of the world.'

**Day 3**

**Pre-reading activity**

| A | B |
|---|---|
| Actor | A person who flies airplanes. |
| roar | Something which is expensive |
| Jet fighter | A sound which is loud and deep |
| Famous | A person who acts in films and television series. |
| Pilot | An airplane which operates by jet propulsion. |
| sumptuous | A person who is known to most people |

**Reading**


Aston University
Illustration removed for copyright restrictions

**Text comprehension**

Answer the questions.

1 What kind of people live in Jumbolair?
2 Does John Travolta own three planes or more than three?
3 Who owned the Boeing 707 before Travolta?
4 What is Travolta's home like?
5 Why is it called 'the ultimate boys' fantasy house'?
6 What is 'apt' about the name of his son?
7 Why don't the neighbours complain about the noise?
8 Does Travolta behave like a typical film star?

**Appendix 17 The questionnaire**

**Please answer the following questions by ticking yes or no. For questions which require you to write, you can answer them either in Arabic or English.**

| |
|---|
| First name only:<br>Age: |

1. Are you motivated to learn English? If yes, move to question (2). If no, move to question (3).

Yes ( )

No ( )

2. Which of the following reasons could be the possible reason behind your motivation?

a) To travel abroad ……

b) To become a teacher of English ……

c) To get the opportunity for a good job ……

d) Others (please specify) ……

3. Do you depend solely on the teacher's explanation to understand the lesson? If yes, move to section TWO. If no, move to question 4.

Yes ( )

No ( )

4. Do you depend on others (tutors, member of family, friends etc)?

Yes ( )

No ( )

5. What kind of help you get?

Please specify ……...……

……

**SECTION TWO**

6.To what extent do you think that the following points are important in an English lesson? Please tick as appropriate.

**A= extremely important; E= not important at all**

| | | A | B | C | D | E |
|---|---|---|---|---|---|---|
| 1 | Explicit explanation of the targeted form | | | | | |
| 2 | Explaining the normal difficulties Syrian students usually face in learning the target form | | | | | |
| 3 | Providing students with many examples of the targeted form after the explicit instruction | | | | | |
| 4 | Urging students to practice the use of the targeted structure directly after the explicit instruction | | | | | |
| 5 | Oral practice | | | | | |
| 6 | Written practice | | | | | |
| 7 | Feedback | | | | | |

**SECTION THREE**

7. Do you think that the lesson you had on relative clauses is different from the way you are used to? If yes, move to question (8); if no, move to question (9).

Yes ( )

No ( )

8. How would you explain these differences?

……

……

……

……

9. Do you think that the teacher's focus on giving many examples of the different types of relative clauses helped you in understanding relative clauses?

Yes ( )

No ( )

10. Or, do you think that the production practice you are used to is more useful for you?

……

11. Do you think that the differences between English and Arabic relativisation systems cause you problems? If yes, move to question (12); if no, move to question (13).

Yes ( )

No ( )

12. Can you give an example?

……

……

……

13. In processing (understanding) English relative clauses, did you rely on your knowledge of Arabic relative clauses to process English relative clauses? If yes, move to question (14); if no, move to question (15).

Yes ( )

No ( )

14. Do you think that the teacher's explanation of the problematic strategies used normally by Arab learners in processing English relative clauses was helpful?

Yes ( )

No ( )

15. Are you satisfied with your answers in the direct post-test which included questions which require you to produce relative clauses? If yes, move to question (17); if no, move to question (16).

Yes ( )

No ( )

16. How would explain the reasons for not writing well in the post-test?

……

……

17. What are the points which you wish to be included in English lessons to be more successful? Please write three suggestions:

a) ……

b) ……

c) ……

18. Is there anything else you would like to add?

……

……

……

Thank you

**Appendix 18 Processing instruction group: deleted activity**

**Decide on the type of the following relative clauses by circling the correct letter:**

**1.** You are reading a story which I want to read.

a) subject b) possessive c) Object d) object of preposition e) Indirect object

2. The teacher to whom I gave the book is very respectful.

a) subject b) possessive c) Object d) object of preposition e) Indirect object

3. The baby whom she looks after is my niece.

a) subject b) possessive c) Object d) object of preposition e) Indirect object

4. The book whose cover page is torn is from the central library.

a) subject b) possessive c) Object d) object of preposition e) Indirect object

5. I dislike people who tell lies.

a) subject b) possessive c) Object d) object of preposition e) Indirect object

6. This is the girl whom you argued about yesterday.

a) subject b) possessive c) object d) object of preposition e) Indirect object

7. The woman who is talking with the gentleman is my sister.

a) subject b) possessive c) object d) object of preposition e) Indirect object

8. He is the sort of man to whom money is no object.

a) subject b) possessive c) object d) object of preposition e) Indirect object

9) I know the young lady whose car was stolen last night.

a) subject b) possessive c) object d) object of preposition e) Indirect object

10) The man whose car ran out of petrol is upset.

a) subject b) possessive c) object d) object of preposition e) Indirect object

**Appendix 19 Student research ethics approval form**

**PLEASE NOTE: You MUST gain approval for any research BEFORE any research takes place. Failure to do so could result in a ZERO mark**

**Name**
**Student Number**
**Module Name**
**Module Number**

**Please type your answers to the following questions:**

**1. What are the aim(s) of your research?**

**2. What research methods to you intend to use?**

**3. Please give details of the type of informant, the method of access and sampling, and the location(s) of your fieldwork. (see guidance notes).**

**4. Please give full details of all ethical issues which arise from this research**

**5. What steps are you taking to address these ethical issues?**

**6. What issues for the personal safety of the researcher(s) arise from this research?**

**7. What steps will be taken to minimise the risks of personal safety to the researchers?**

**Statement by student investigator(s):**

I/We consider that the details given constitute a true summary of the project proposed

I/We have read, understood and will act in line with the LSS Student Research Ethics and Fieldwork Safety Guidance lines .

| Name | Signature | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

**Statement by module convenor or project supervisor**

I have read the above project proposal and believe that this project only involves minimum risk. I also believe that the student(s) understand the ethical and safety issues which arise from this project.

| Name | Signature | Date |
|---|---|---|
| | | |

This form must be signed and both staff and students need to keep copies.