



TEL AVIV UNIVERSITY
LESTER AND SALLY ENTIN FACULTY OF THE HUMANITIES
DEPARTMENT OF LINGUISTICS

**PARAMETERS (OR LACK THEREOF) IN L2 ACQUISITION:
THE NULL SUBJECT PARAMETER**

MA THESIS SUBMITTED BY

NOA BRANDEL

PREPARED UNDER THE GUIDANCE OF

DR. IRENA BOTWINIK

PROF. TAL SILONI

SEPTEMBER 2014



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ABSTRACT

Several hypotheses have been proposed concerning the initial state in second language (L2) acquisition and the role of UG in the acquisition process. The current study explores the validity of the Full Access Full Transfer Hypothesis, according to which initially, L2 learners inherit parameter values from their L1 (*full transfer*), but in the course of acquisition, when faced with the relevant (contradicting) L2 input, the learners can reset these values, due to the *full access* they have to UG (Schwartz and Sprouse 1994, 1996).

In order to check whether such transfer and resetting occur (i.e., whether the L2 learner indeed has access to UG), I conducted a study that focuses on the Null Subject Parameter among native Hebrew-speaking children (L1: Hebrew) acquiring English as a second language (L2: English). The two languages differ in their values of the Null Subject Parameter, with English being a non-null-subject language and Hebrew being a (partial/mixed) null-subject one. A resetting is thus required in order for the acquisition to take place. I further sought to unveil the influence of explicit positive evidence of one of the features associated with the parameter upon its resetting to the L2 value.

106 Hebrew-speaking 6th-graders, who have been learning English as an L2, were tested on three of the properties associated with the Null Subject Parameter: (i) Thematic (argumental) pronominal subject omission; (ii) Expletive pronominal subject omission and (iii) Post-verbal subjects (Rizzi 1986). They were first tested via a translation-choice task from Hebrew to English. 69 of these participants were then divided into two groups, both of which were exposed to the feature of expletive elements (i.e., the pronouns *it* and *there*). In one of the groups an emphasis was put upon these expletive pronouns via explicit positive evidence. The two groups were tested again immediately after the teaching sessions, using the same task, in order to compare the performance of the group that was exposed to explicit positive evidence with the performance of the group that was not. 63 of these participants were further tested four months following the teaching sessions, in order to reveal the retaining (or lack thereof) of knowledge acquired via explicit positive evidence.

Results show that shortly after the teaching sessions, the group taught explicitly improved significantly in the rejection of ungrammatical null expletive subjects in weather constructions (that require the expletive *it*), as well as in the

rejection of ungrammatical post-verbal subjects (the expletive *there* was already mastered in existential constructions prior to the teaching sessions). However, in the long run, this improvement was not fully preserved. Concerning the remaining property associated with the Null Subject Parameter – rejection of null thematic subjects – no improvement was detected shortly after the lessons, in both groups. The two groups did not demonstrate a significant increase in the rejection of null thematic subjects in the long run either. Possible explanations for this finding are discussed.

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1. INTRODUCTION

This study deals with parameters (or lack thereof) in L2 acquisition. Specifically, it focuses on the Null Subject Parameter among Hebrew-speaking 6th-graders acquiring English as a second language. The study examines the Full Access Full Transfer Hypothesis, according to which L2 learners inherit parameter values from their L1 grammar (*full transfer*), and have *full access* to UG (Schwartz and Sprouse 1994, 1996). It thus follows that if the L2 differs from the L1 in its parameter value, a resetting of the parameter is predicted.

In order to check the validity of the Full Access Full Transfer hypothesis, that is, in order to see whether transfer from the L1 indeed takes place and whether the inherited parameter values can be reset, the L1 and the L2 should differ in their values for the parameter. The current study thus focuses on native Hebrew-speaking children (L1: Hebrew) acquiring English as a second language (L2: English).¹ Hebrew and English indeed demonstrate different values of the Null Subject Parameter, with English being a non-null-subject language and Hebrew being a (partial/mixed) null-subject one (cf. section 2.3.2 for further discussion). A resetting is thus expected to occur in order for the L2 acquisition to take place. Testimony for such a resetting will serve to falsify hypotheses that reject transfer from the L1 grammar (e.g., Platzack's 1996 Initial Hypothesis of Syntax or Flynn and Martohardjono's 1994 Full Access Hypothesis; cf. section 2.1.3 for more details), as well as hypotheses that reject any access to UG (e.g., Tsimpli and Roussou 1991, Clahsen and Hong 1995, to name but a few).

The goal of this study bifurcates into two different, although interrelated, domains. First, it aims to check whether L1 parameter values constitute a part of the L2 initial state, i.e., whether L1 transfer takes place. It further aspires to explore the accessibility of parameters in L2 acquisition, i.e., whether resetting of parameter values is possible and whether it prompts the acquisition of a feature cluster. The findings of the current study thus bear theoretical implications for the study of L2

¹ English may be categorized as a 'foreign language' in Israel since it is taught at school via an instructional process (Richards and Schmidt 2002). However, although its acquisition in Israel cannot be determined as an environmentally natural process, Israeli children are exposed to English on a daily basis, via TV shows, movies, video clips and songs. I have thus chosen to refer to it as a 'second language,' but it is in fact categorically interstitial.

acquisition, with regard to the question of whether L2/interlanguage grammars are UG-constrained. Second, the study seeks to unveil the influence of explicit positive evidence upon parameter resetting in L2 acquisition (cf. section 3.1 for a discussion of the role of positive evidence in L2 acquisition). More specifically, it checks whether explicit positive evidence of one of the parameter's features can improve L2 learning by instigating the parameter resetting into its L2 value. It is further meant to examine the retaining of knowledge acquired by means of explicit positive evidence (i.e., conscious knowledge of the language).

The study was experimental in nature. I taught two parallel groups of Hebrew-speaking 6th-graders, who are learning English as an L2. In one of the groups I drew the pupils' attention to one of the parameter's features, while comparing English and Hebrew in this respect (as the two differ in this feature). In the other group I did not mention the feature explicitly, but merely exposed the pupils to English structures incorporating that feature, to the same extent as I exposed the first group. I further exposed both groups to additional structures, which incorporate other features that constitute the feature cluster acquired with the parameter setting (cf. section 2.3.1 to see the feature cluster adopted in this study for the Null Subject Parameter and Appendix I for the teaching materials). The pupils' L2/interlanguage linguistic competence was examined via a translation-choice task (cf. section 4.2.2 for an explanation of the task, section 4.3 for the motivation for using this kind of task and Appendix II for the materials used in the tests). The pupils' competence was first checked before the teaching sessions in order to detect L1 transfer (or lack thereof). It was then examined following the teaching sessions to see the effect (if any) of explicit positive evidence upon the parameter resetting. It was further reexamined four months later, in order to find out whether the explicit positive evidence has a persisting effect in the long run. The comparison between the two groups enabled me to inspect the influence of explicit positive evidence upon both the rapidity of the resetting of the parameter and the retaining of the newly-set value.

The study is organized as follows: Section 2 provides the theoretical background to the study, covering: (i) the initial state and the role of UG in L2; (ii) parameters in L2 acquisition, and (iii) the Null Subject Parameter. Section 3 is dedicated to learnability issues and the nature of the evidence required for language

acquisition. Section 4 presents the method of the experiments: participants (4.1); materials and stimuli (4.2); design (4.3) and procedure (4.4). In section 5 I present the results of the experiments. I discuss these results in section 6 and present my conclusions in section 7.

2. PRINCIPALS AND PARAMETERS (UNIVERSAL GRAMMAR)

The framework underlying the current research is the generativist theory of Universal Grammar (UG). In line with Chomsky (1981a, 1981b, 1986), I assume an innate linguistic basis with which humans are born. This basis is comprised of principles and parameters.

Whereas principles are invariant rules that are expected to appear across languages, parameters are rules whose values are set following the exposure to the input of the specific language being acquired. The values of parameters are generally assumed to be binary (i.e., parameters can be set to either "Yes" or "No"). The initial value may simply be underdetermined or it may be a default value (the unmarked one).

The principles can thus account for (as well as predict) the similarity between languages, while the parameters can explain the pattern of crosslinguistic variation. Together, the principles and parameters enable us to predict both possible and impossible grammars (White 2003).

2.1. The Initial State and the Role of UG in L2 Acquisition

UG, which consists of principles and unvalued parameters, is assumed by generativists to constitute the initial state in L1 acquisition (e.g., Chomsky 1981a, 1981b, 1986). Concerning the initial state in L2 acquisition, generative linguists have devised several hypotheses. These hypotheses differ in relation to the role UG plays in the acquisition process. Consequently, they predict different developmental paths for L2 learners. The proposed research cannot unequivocally support one of the hypotheses concerning the initial state in L2 acquisition, as it focuses on a single parameter, but it is expected to falsify some of these hypotheses. I shall briefly review here the main generative hypotheses regarding L2 acquisition.²

² Some linguists propose that UG is inaccessible during L2 acquisition (e.g., Tsimpli and Roussou 1991, Clahsen and Hong 1995, Bley-Vroman 1997, Neeleman and Weerman 1997). I shall not present their hypotheses here, since I believe Sauter (2002) and White's (2003) surveys of L2 acquisition studies provide robust evidence in favor of (at least partial) access to UG during the acquisition of a second language.

2.1.1. Full Access with Full Transfer

The Full Transfer/Full Access Hypothesis maintains that there is full transfer from the L1 grammar on the one hand and that there is full access to UG on the other hand (Schwartz and Sprouse 1994, 1996). This means that the initial state of L2 acquisition is the final state of L1 acquisition. Moreover, it suggests that failure to represent the L2 input by the L1 grammar can trigger restructurings, based on the options UG has to offer. Thus, under the Full Transfer/Full Access Hypothesis, resetting of parameters is predicted to occur. This hypothesis does not guarantee a final state which is identical to the L2 grammar, because the L1 grammar or subsequent interlanguage grammars may analyze the L2 input differently from native speakers (White 2003). It is important to note that this is the only hypothesis that predicts different initial states and different developmental paths for L2 learners speaking different L1s. White mentions some works that present substantial evidence in favor of this hypothesis, among them: White (1985), Schwartz and Sprouse (1996), Haznedar (1997), Yuan (1998) and Slabakova (2000).

2.1.2. Full Access with Partial Transfer

2.1.2.1. The Minimal Trees Hypothesis

The Minimal Trees Hypothesis suggests partial transfer from the L1 grammar and full access to UG (Vainikka and Young-Scholten 1994). It proposes that the L2 initial state consists only of lexical categories of the L1, with no functional categories (reflecting Radford's 1986, 1990 Small Clause Hypothesis regarding L1 acquisition). Under this proposal, the initial state of L2 acquisition is a partial version of the L1 final state and failure to represent the L2 input by the L1 grammar triggers the addition of functional categories available from UG. It thus follows that resetting of parameters is predicted to occur under the Minimal Trees Hypothesis. This hypothesis predicts a final state which is identical to the L2 grammar, at least in terms of functional projections and their consequences, since the L2 input required to trigger the relevant properties is available to the L2 learner. White (2003) mentions some works that are inconsistent with this hypothesis (although meant to support it), among them: Lakshmanan (1993/1994), Lakshmanan and Selinker (1994), Grondin and White (1996), Schwartz and Sprouse (1996) and Haznedar (1997).

2.1.2.2. The Valueless Features Hypothesis

Under the Valueless Features Hypothesis, both lexical and functional categories of the L1 grammar become part of the L2 initial state (Eubank 1993/1994). However, the initial state of L2 acquisition is a partial version of the L1 final state in the sense that the features associated with the functional categories (e.g., $\pm V$ to I movement) are assumed to be transferred without any value. The values of the functional features are claimed to be acquired upon the acquisition of the relevant morphological paradigms (in the spirit of Clahsen and Penke's 1992 proposal that morphology instigates syntax acquisition in L1). The possible feature values that can be acquired are drawn from UG, to which the L2 learner has full access. Thus, under the Valueless Features Hypothesis, resetting of parameters is expected to occur. This hypothesis predicts a final state which is identical to the L2 grammar. White (2003) mentions some works that are inconsistent with this hypothesis (although meant to support it), among them: Eubank, Bischof, Huffstutler, Leek and West (1997), Eubank and Grace (1998) and Yuan (2001).

2.1.3. Full Access without Transfer

2.1.3.1. The Initial Hypothesis of Syntax

The Initial Hypothesis of Syntax suggests no transfer from L1. Rather, on a par with L1 acquisition, the L2 initial state is UG (Platzack 1996). Consequently, L2 development is predicted to be fully constrained by UG (i.e., there is full access to UG), and only unmarked or default (weak) feature values are included. This hypothesis predicts a final state which is identical to the L2 grammar. White (2003) mentions some works that are inconsistent with this hypothesis, among them: White (1990/1991, 1991), Schwartz and Sprouse (1994), Vainikka and Young-Scholten (1994) and Haznedar (1997).

2.1.3.2. The Full Access Hypothesis

The Full Access Hypothesis also implies (although not explicitly) that UG must constitute the initial state in L2 (Flynn and Martohardjono 1994). Hence there is full access to UG, in parallel with both L1 acquisition and the Initial Hypothesis of Syntax, and L2 development is UG-constrained. Nevertheless, the Full Access Hypothesis differs from the Initial Hypothesis of Syntax in that it specifically rejects any transfer from the L1 grammar into the L2 initial state. The final state is predicted to be

identical to the L2 grammar. White (2003) argues that studies allegedly supporting this hypothesis are neutral, at best, as they can support all of the abovementioned hypotheses (e.g., Epstein, Flynn and Martohardjono 1996).

2.2. Parameters in L2 Grammars

White (2003) presents a variety of evidence in favor of universal restrictions that apply to L2 acquisition as well. Based on experiments that were conducted upon L2 acquirers coming from miscellaneous backgrounds (i.e., different L1s), universal principles appear to constrain L2 grammars too. Nevertheless, the source of this abstract unconscious knowledge may also be some abstract level of the L1, rather than UG. Parameters are thus of paramount importance in determining the role of UG in L2 acquisition. If the L2 differs from the L1 in its parameter value, a resetting of the parameter will support the position that UG constrains interlanguage grammars. On the other hand, if a resetting fails to occur, it may suggest (although not necessarily) evidence against the role of UG in interlanguage grammars.

White reviews two general positions concerning the status of parameters in interlanguage grammars: impaired and unimpaired parametric systems. Those will be briefly reviewed below.

2.2.1. Breakdown in the Parametric System

One perspective holds that parametric systems in interlanguage grammars are impaired, either globally or locally. This means that interlanguage grammars are either not UG-constrained at all or not fully-UG constrained.

2.2.1.1. Global Breakdown

Under this approach, no parameters are found in interlanguage grammars, as the latter are construction specific, rather than UG-constrained (e.g., Clahsen and Hong 1995, Neeleman and Weerman 1997). This means that each construction theoretically associated with a given parameter has to be learned separately, on a construction-by-construction basis, and the different constructions (features) are not clustered by a parameter. According to this approach, UG does not constrain interlanguage grammars, in line with the Fundamental Difference Hypothesis, differentiating between the nature of L1 acquisition and L2 acquisition (Bley-Vroman

1997). White (2003) criticizes studies allegedly supporting global impairment either in terms of methodology or in terms of their inconclusive results, which may be interpreted in more than one way.

2.2.1.2. Local Breakdown

This approach holds that parameters are found in interlanguage grammars, but some of them are defective. For example, Beck's (1998) Local Impairment Hypothesis claims that feature values are permanently inert in interlanguage grammars, as feature strength is rendered non-acquirable. This means that some parameters are never set, neither to the L1 value nor to the L2 value. A local breakdown suggests that interlanguage grammars are not fully UG-constrained. White (2003) criticizes Beck's (1998) hypothesis and study, stating the hypothesis is unfalsifiable.

2.2.2. Unimpaired Parametric System

The opposite perspective maintains that interlanguage grammars remain intact and conform to parameter settings. They are hence UG-constrained.

2.2.2.1. The No Parameter Resetting Hypothesis

Under this hypothesis, only L1 parameter settings can be found in the interlanguage grammar, while new parameter settings are unavailable and cannot be acquired in spite of positive evidence that would be expected to motivate resetting (Hawkins and Chan 1997; Hawkins 1998). The interlanguage grammar is considered UG-constrained because it is constrained by the L1 grammar, which is also UG-constrained. Resetting of parameters is impossible in terms of this hypothesis. Hawkins and Chan's (1997) study in terms of the Failed Functional Features Hypothesis is critiqued by White (2003) as the results can be interpreted in a different manner, and the account offered to explain the results suggests a very rare type of grammar. She discusses other studies that serve as counter-evidence to the No Parameter Resetting Hypothesis (e.g., White and Juffs 1998).

2.2.2.2. Parameter (Re-)Setting

This hypothesis proposes that the interlanguage grammar is not limited to the L1 parameter settings. Rather, it may inherit the L1 settings, and those can be reset due to full access to UG (as is the case in the Full Access Full Transfer Hypothesis).

Another possibility is that the interlanguage grammar does not include L1 values, but the parameters are set to their L2 values due to exposure to the L2 input (in accordance with the Full Access without Transfer Hypotheses). The two options thus agree on the possibility of parameter settings in L2 (i.e., the parametric system is unimpaired), but they differ in terms of the (lack of) change of the parameter value during the course of development. According to White (2003), both White (1992) and Yuan's (2001) studies indicate an unimpaired parametric system, but provide no clear-cut support to either of the approaches (i.e., full transfer of parameter values from the L1 or lack of such transfer).

2.2.2.3. Settings Found neither in L1 nor in L2

Since parameters are interrelated (White 2003), and may even be hierarchically or implicationally related (e.g., Hyams 1986, Wexler and Manzini 1987, Baker 2001, Roberts and Holmberg 2005), associated parameters are no longer restricted to binary values, since all kinds of combinations are possible when more than one parameter is involved. In these cases, the interlanguage grammar might include combinations of parameter settings that are found neither in the L1 nor in the L2. Such a combination is still constrained by UG and is hence found in languages other than the L1 or the L2. Schwartz and Sprouse (1994) and MacLaughlin's (1998) studies suggest evidence that this kind of combinations of parameter settings indeed exists, but White (2003) states these studies raise questions concerning the motivation provided by the L2 to trigger such a misanalysis.

2.3. The Null Subject Parameter

The Null-Subject Parameter, also known as the *Pro*-Drop Parameter (coined by Rizzi 1982 and Chomsky 1981a, respectively), traditionally divided the languages of the world between those that enable a phonetically-null subject position (e.g., Spanish, Italian, Hebrew, Korean), and those that do not (e.g., English, French, German).³

³ This dichotomous division has proven to be inadequate, as will be discussed at length in section 2.3.3. Thus, for example, German has been identified as a subtype of non-null-subject languages, as it allows only expletive (non-thematic) third person null subjects, but not thematic ones. Cf. section 2.3.2 for a discussion concerning the status of Hebrew in terms of the Null Subject Parameter.

- c. **rakad im dana*
danced.3SG.MSC. with Dana
- (6) a. *erkod im dana*
will-dance.1SG. with Dana
'I will dance with Dana.'
- b. *tirkod im dana*⁸
will-dance.2SG.MSC. with Dana
'You will dance with Dana.'
- c. **yirkod im dana*⁹
will-dance.3SG.MSC. with Dana
- (7) a. *(*ani/ata/hu*) *roked im dana*
I/ you/he dancing.MSC. with Dana
- b. *(*anaxnu/atem/hem*) *rokdin im dana*¹⁰
we/ you/ they dancing.PL.MSC. with Dana

As expected, Hebrew allows null expletives across the board:

- (8) (**šam*) *yeš iparon al ha-šulxan*
there has a-pencil on the-table
'**There** is a pencil on the table.'
- (9) (**ze*) *metaftef ba- xuc*
it is-drizzling in-the-outside
'**It** is drizzling outside.'

In certain cases (8-9) null expletives are the only option (i.e., lexical expletives are impossible), while in other cases (10-11), an element that looks like an expletive is optional: *ze* 'it.'

⁸ Interestingly, the Hebrew future form of the second-person singular masculine and of the third-person singular feminine are identical: *ata tirkod* 'You will dance' versus *hi tirkod* 'She will dance.' However, once the subject is omitted, the shared form is disambiguated and the only acceptable meaning is that of the second person pronoun: *tirkod* 'You will dance!'/'Dance (second-person singular imperative).' This further emphasizes the impossible subject omission in the third person (Also observed by Ritter 1995).

⁹ In colloquial Hebrew, this form is also used for the future tense first-person singular. When this form is used, subject omission is rendered impossible in first-person singular as well (cf. Borer 1989, Elisha 1997, Vainikka and Levy 1999). This is the consequence of the phonetic obliteration of the person distinction in the future singular: both first-person singular and third-person masculine singular are pronounced *ye-* (traditionally, (אני)e- signified the first-person singular while *ye-* signified the third-person masculine singular).

¹⁰ This sentence may be judged as grammatical if the agent doing the dancing is an arbitrary *pro*, interpreted as a general agent, similar to the agent in 'Dancing with Dana,' or in 'To dance with Dana.' However, as a sentence involving a specific agent that is phonetically null (e.g., they, we, you), this sentence does not pass as grammatical.

(10) (**ze**) *margiz oti še- itamar tamid me'axer*
 (it) annoys me that-Itamar always late
 'It annoys me that Itamar is always late.'

(11) (**??ze**) *kar ba- xuc*¹¹
 it cold in-the-outside
 'It is cold outside.'

The status of *ze* is unclear. Hyams (1986), following Borer (1981), mentions Modern Hebrew as a language that does not conform to the generalization that null-subject languages lack expletives, as it allows an optional expletive *ze* in extraposition constructions such as (10) above. However, using extraction diagnostics in constructions such as (12) below, Hazout (1994) shows that the *ze* involved in such contexts is in fact a different kind of element, which greatly differs from other expletives in terms of its distribution. He argues that it is a referential NP, serving as a subject, and as such must be assigned a theta role.

(12) *ze kaše li-lmod latinī*
 it hard to-learn Latin
 'It is hard to learn Latin.'

Nevertheless, the fact that *ze* can appear in certain weather constructions (e.g., 11) blurs the picture even further. The vague status of *ze* thus calls for further research, but that is beyond the scope of the present study.

¹¹ In weather contexts, *ze* may appear marginally with weather adjectives (i) but not with weather verbs (ii):

(i) <i>(??ze) kar/xam/me'unan ba- xuc</i> (??it) cold/hot/ cloudy in-the-outside 'It is cold/hot/cloudy outside.'		(ii) <i>(*ze) metaṭef/yored gešem</i> (*it) drizzles/ descends rain 'It drizzles/rains.'
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It is important to note that appearances of *ze* in weather contexts are quite rare. Interestingly, although speakers might use *ze* occasionally in these contexts, when asked if they accept it, they either judge it to be ungrammatical, or they hardly accept it, saying they would not use it themselves. Google searches show a negligible amount of results.

Danon (to appear) shows that *ze* also serves as a copula in Modern Hebrew. The form *ze* is thus equivocal in Hebrew, as it may serve as a referential NP that refers to a proposition (10,12), a demonstrative third-person pronoun (iii, iv) and a copula (v).

(iii) <i>ze ta'im</i> this/that tasty 'This is tasty.'		(iv) <i>ani ohev et ze</i> I like ACC it 'I like it.'		(v) <i>yeladim ze braxa</i> children COPULA a-blessing 'Children are a blessing.'
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It remains unclear whether *ze* is an expletive in weather constructions. In any event, even if it is an expletive, it is always optional. Thus expletive elements (if existent) are not obligatory in Hebrew, so the latter still patterns with null-subject languages in this respect.

On a par with null-subject languages, post-verbal subjects are grammatical in Hebrew (13), but their distribution is limited to verbs lacking an external argument (unaccusative and passive verbs), as shown in (13) and (14) below.

- (13) a. *ba'u* ***hamon anašim***
 came.3PL.MSC. a-lot-of people
 'Many people came.'
- b. *higi'u* ***kama yeladim***
 arrived.3PL.MSC. a-few children
 'A few children arrived at the party.'
- (14) a. **racu* ***hamon anašim***
 ran.3PL.MSC. a-lot-of people
- b. **rakdu* ***kama yeladim***
 danced.3PL.MSC. a-few children

Finally, as expected in null-subject languages, there are no *that*-trace effects with the Hebrew complementizer parallel to the English 'that': *še-*, as seen in (15a). However, *that*-trace effects do appear with the complementizer equivalent to the English 'if/whether': *im* (15b).¹²

- (15) a. *mij amarta še-tj yavo la- mesiba?*
 who said.2SG.MSC. that will-come.3SG.MSC. to-the-party
 'Who did you say will come to the party?'
- b. **mij ša'alta im-tj yavo la- mesiba?*
 who asked.2SG.MSC. if will-come.3SG.MSC. to-the-party

That-trace effects will not be examined in the current study due to their ambivalent status in Hebrew, as well as to the relative complexity of L2 embedded sentences, which might be too difficult for the young participants in the experiments.

The unique pattern seen in Hebrew thus calls for a modification of the traditionally dichotomous division between null-subject languages and non-null-subject ones. The following section (2.3.3) reviews several non-binary versions for the Null Subject Parameter that have been suggested in the literature.

¹² Shlonsky (1988) distinguishes between *im* 'if/whether' and *še-* 'that,' claiming the latter is a clitic. For further details regarding *that*-trace effects in Hebrew, see Shlonsky (1988).

2.3.3. Various Accounts of Subject Omission

Rizzi (1982, 1986) offers to account for the subject omission pattern seen in various languages (e.g., Italian, English and German) in terms of the interaction between *licensing* and *identification*. Licensing is done by some syntactic property that permits null subjects: Case marking by a specific governing head (AGR/INFL), i.e., a position which is assigned Nominative Case. Identification is achieved via a specific agreement/inflection (AGR/INFL) (in I or its successors), which is sufficiently "rich" to allow the recovery of an omitted subject.¹³ Based on licensing and identification, Rizzi's account predicts three types of languages: (i) If both licensing and identification are possible, a uniform null-subject pattern is achieved (e.g., Italian and Spanish); (ii) If licensing is impossible, a uniform non-null-subject pattern is achieved (e.g., English), and (iii) If identification is lacking, expletive (non-referential) subjects can be null, but referential ones cannot (e.g., German). Hebrew appears to behave on a par with type (i) in the first and second persons in the past and future tenses, but reflects type (iii) in the third person, which disallows subject omission except for expletives and other special constructions. Finnish demonstrates a similar pattern, as reported by Vainikka and Levy (1999). The subject omission pattern seen in these two languages is thus not straightforwardly predicted by Rizzi, although his proposal can be adapted to account for it (e.g., the accounts of Borer 1989; Speas 1994, 1995; Vainikka and Levy 1999, which will be discussed below).

Jaeggli and Safir (1989) modify Rizzi's (1982, 1986) account due to languages that enable null subjects but lack agreement (e.g., Chinese, Japanese and Korean; Huang 1984). They offer a slightly different three-way distinction: (i) Null-subject languages with rich agreement; (ii) Null-subject languages with no agreement, and (iii) Languages with partial agreement which do not allow subject omission (e.g., English). They account for these patterns of subject omission via the notion of Morphological Uniformity, that is, the entire paradigm either demonstrates overt inflectional morphology, or it manifests no overt morphology. Jaeggli and Safir

¹³ In Rizzi (1982), he suggests that the licensing of *pro* in subject position is accomplished via an AGR bearing the feature [+pronoun]. However, he later adjusts his account, suggesting that *pro* can also be licensed by other governing heads, e.g., V in Italian and P in French (Rizzi 1986). This means that *pro* can appear in positions other than subject position, and this possibility is subject to variation between languages, according to their different sets of *pro*-licensing governing heads. For further discussion see Rizzi (1986) and references within.

suggest that morphologically uniform languages license null subjects, whereas languages with mixed paradigms do not allow subject omission. As for identification of thematic null subjects, they suggest it can be achieved either via an AGR that Case-governs the null subject (in rich-agreement languages) or via an AGR that inherits agreement features from a c-commanding NP or AGR (*à la* Borer 1989, as shall be elaborated below), and can thus govern the null subject (in no-agreement languages and in Hebrew).

Regarding the mixed pattern seen in Hebrew, Jaeggli and Safir (1989) maintain that the present-tense INFL is defective and cannot inherit the full set of features required for identification. However, the fact that third-person thematic subjects cannot be omitted in the past and future tenses in Hebrew, although the past- and future- tenses INFLs are predicted to identify null subjects, remains unaccounted for. So does the different identification of thematic null subjects they assume for Italian-type languages and for Hebrew; despite the similar agreement patterns seen in those languages, the authors suggest identification is achieved via an AGR that Case-governs the empty category in the former, whereas the latter renders an AGR an identifier only when it is c-commanded by a higher AGR, from which it inherits features. Jaeggli and Safir do not deal with Finnish in their paper, but as a morphologically uniform language that disallows third-person thematic null subjects, its pattern is also not predicted by their account. Jaeggli and Safir's predictions are not borne out in additional languages. On the one hand, the mainland Scandinavian languages do not allow null expletives, although their verbal paradigms are morphologically uniform and are thus expected to license null expletives at the very least (*ibid.*, fn. 17). On the other hand, Roberts (1991) notes that Old French licenses null subjects despite its non-uniform morphological paradigm (cf. Vainikka and Levy 1999 for a review of additional empirical problems with Jaeggli and Safir's account).

Two main proposals that attempt to account for mixed languages shall be discussed now: Speas (1994, 1995) and Borer (1989).¹⁴ Speas (1994, 1995) agrees

¹⁴ See Shlonsky (2009) for an additional proposal along Borer's (1989) lines, which deals with an additional type of finite T head in Hebrew: T bearing *eyn*, the negative auxiliary that occurs in present tense sentences. Shlonsky proposes that Hebrew null subjects are licensed

with Rizzi (1982, 1986) that null subjects are possible only in syntactic positions that license them. This licensing, she argues, can be achieved through the Minimalist Principle of Economy of Projection: "Project XP only if XP has content" (Speas 1994: 186). Speas further distinguishes between three types of languages in terms of agreement: (i) *Strong agreement* languages with an AGR head in which the inflectional affixes are base-generated; (ii) *Weak agreement* languages that have an empty AGR position since inflectional morphology is already attached to the stem prior to lexical insertion, and (iii) Agreement-less languages that have no AGR. Accordingly, in terms of subject omission, she reaches a triple generalization: (i) A language allows null subjects if AGR is base-generated with a morpheme in it, i.e., AGR has phonological content (an agreement affix) and thus AgrP can be projected (e.g., Italian); (ii) A language cannot have null subjects if AGR is base-generated on the verb, i.e., AGR has no content and thus spec.AgrP has to be fulfilled in order for AgrP to be projected (e.g., English), and (iii) A language enables null subjects if it has no AGR, i.e. the language lacks agreement marking and AgrP need not be projected (e.g., Chinese).

Speas's account for the Hebrew mixed null subject system is not compelling. She argues that Hebrew belongs to type (ii) and thus disallows null subjects. In order to account for subject omission in the past and future tenses, she claims that the apparent null subjects in fact involve overt pronouns that have been incorporated into the verb. This means that Hebrew is a non-null-subject language since it requires overt pronouns (in the subject position or on the verb), while the subject position can be realized or not. Vainikka and Levy (1999) criticize this account as it does not explain how a pronoun which is incorporated into the verb satisfies Speas's (1994) licensing principle (i.e., what content is found under the projected DP in the subject position). Moreover, Speas does not specify why incorporation of pronouns into the verb is obligatory in the first and second persons in Hebrew, whether the subject position is realized and whether it is not realized. For additional criticism (regarding Finnish), see Vainikka and Levy (1999).

via non-standard binding/control that endows the null pronoun with a person specification. His account thus reflects Borer's idea of licensing via binding, as will be explained below.

Borer (1989) demonstrates a quite successful attempt to account for the mixed pattern seen in Hebrew. She claims the Hebrew AGR in past/future embedded clauses is an anaphor that requires a binder (a coindexed antecedent in the matrix clause). The anaphoric AGR can thus account for the impossible subject omission in third-person past/future embedded clauses.¹⁵ As for the third-person past/future matrix clauses, Borer accounts for the obligatoriness of phonetically-realized subjects there via a lack of "I-identification," deriving from impoverished person marking in the third person (an idea reminiscent of Rizzi's 1982, 1986 notion of identification). She further claims that present tense third-person clauses disallow subject omission due to lack of both binding and I-identification. According to Vainikka and Levy (1999), Borer's account is problematic mainly because it cannot fully account for the Finnish subject omission pattern in embedded clauses (for further details, see Vainikka and Levy 1999). It could thus be termed as a narrow, construction-specific mechanism of an anaphoric AGR.

Vainikka and Levy (1999) suggest a unified account for all the above-mentioned types of languages, Hebrew and Finnish included. They propose parametric variation between languages with respect to the base-generated syntactic positions of their subject-verb agreement features (either spec.VP or AGR).¹⁶ The authors suggest that the relevant feature for the Null Subject Parameter is person, and not number, gender and animacy, which appear to play no role in subject omission crosslinguistically (with agreement-less null-subject languages like Chinese taken into consideration). Their account is based on Rizzi's (1982, 1986) notion of syntactic licensing and identification of the referent of the null subject, unifying both mechanisms into a single syntactic mechanism. Under their proposal, the pragmatic distinction between participants in the discourse and a third, non-present, party is

¹⁵ Excluding cases where a binder in the matrix clause is available. For example:

- (i) *dan_j amar še- pro_j yavo la- mesiba*
 Dan said.3SG.MSC. that- will-come.3SG.MSC. to-the-party
 'Dan_j said that he_j would come to the party.'
- (ii) *hivtaxti lo_j še- pro_j yizke be-pras*
 promised.1SG. to-him that- will-receive.3SG.MSC. in-a-prize
 'I promised him_j that he_j would win a prize.'

¹⁶ Under the VP-Internal Subject Hypothesis, spec.VP is the (deep) subject position (e.g., Kitagawa 1986 and Sportiche 1988).

realized syntactically.¹⁷ They offer a new set of person agreement features: [\pm speaker] and [\pm hearer]. First-person features must always include the speaker: [+speaker], second-person features must involve the hearer: [+hearer] and third-person features must never include any of them: [–speaker –hearer].

Vainikka and Levy state that some languages enable the first- and second-person agreement features to be base-generated in the subject position (spec.VP), rather than in the AGR position, thus allowing subject omission. Hence, they predict a phonological similarity between pronouns and verbal inflection in the first and second persons, reflecting spec-head agreement. However, they claim that UG does not enable third-person features to be the only features base-generated in the subject position, for discourse reasons (because of their remote connection to the conversational situation). This limitation predicts that no language will allow null subjects only in the third person, in accordance with the pragmatics of conversation, and this prediction seems to be borne out.¹⁸ Moreover, it follows from this prediction that no phonological similarity can be seen between pronouns and verbal inflection in the third person.¹⁹ Three language types are predicted to occur, in accordance with the location of the subject-verb agreement features (cf. Table 1 below, adapted from Vainikka and Levy 1999: 624).

¹⁷ Vainikka and Levy's (1999) account is based on Ariel (1990), where discourse plays a significant role in subject omission, as null subjects are termed as High Accessibility Markers, allowing an easier reference retrieval (i.e., allowing an unequivocal interpretation of the omitted subject). Berman's (1990) study incorporates the influence of discourse on *pro*-drop as well, as shall be elaborated upon in section 2.3.4.

¹⁸ This statement may seem problematic with regard to Walkden's (2013) findings concerning Anglian dialects of Old English. His quantitative investigation of referential null subjects in Old English shows that it is in fact a partial null-subject language (at least in Anglian texts), in which null subjects are allowed in the third person, but are proportionally rarer in the first and second persons. However, looking deeply into the examples presented by Walkden, it seems that the cases of null subjects there derive from topic maintenance in extended discourse. If all cases of null subjects attested in this language pattern with the examples presented in the paper, the possibility of third-person subject omission in Old English is not syntactic, but discourse-licensed, a phenomenon attested in Modern English as well (e.g., Berman 1990 and Weir 2012). In these cases, the omitted subject is recoverable "as coreferential to a noun phrase antecedent in the same discourse, but in a different utterance of the same or of a different speaker" (Berman 1990: 1137).

¹⁹ Indeed, Vainikka and Levy (1999) report an astonishing similarity between Finnish and Hebrew in terms of their agreement suffix patterns. Two completely unrelated languages demonstrate a striking correspondence between first-and-second-person affix agreement and first-and-second-person pronominal forms. Such a correspondence is absent from the third person in both languages.

(1) *Subject Omission Contingent upon
the Base-Generated Location of Person Agreement Features*

	Features in spec.VP	Features in AGR	Possibility of Subject Omission	Example
Type I	All	None	Everywhere	Italian
Type II	None	All	Nowhere	English
Type III	1 st /2 nd Person	3 rd person	1 st /2 nd Person Only	Hebrew
*	3 rd Person	1 st /2 nd Person	3 rd Person Only	Unattested

In order to account for the impossible subject omission in the Hebrew present tense, Vainikka and Levy suggest that the person features [+speaker/hearer] are not represented at all on the verb in the present tense. Thus first- and second-person features cannot be generated in spec.VP, and it has to be filled by an overt subject. As for the non-obligatoriness of expletive subjects, and regarding subject omission in generic impersonal constructions (*pro_{arb}*), another feature is proposed: [±referential], which can be base-generated in spec.VP. Thus, when the feature value is [-referential], as is the case with expletives and generic constructions, the subject can be omitted.

I shall propose here an alternative account, which heavily draws from Vainikka and Levy's (1999) suggestion, as well as from Rizzi's (1986) seminal idea of interacting licensing and identification. I adopt Rizzi's syntactic licensing of null subjects, but offer a modified notion of identification, which is based on a strength hierarchy of person features. Thus, instead of the varying location of the person features, offered by Vainikka and Levy, I suggest parametric variation in the strength of the person features, based on their inherent properties of contribution to discourse. All person features are base-generated in AGR, but they can differ in terms of their strength. First- and second-person features are inherently stronger than third-person features, discourse-wise, and hence if a language demonstrates a mixed strength pattern in its person features, it can only be the case that the first and second persons are stronger than the third person, but not vice versa. Note that 'feature strength' here does not necessarily entail strong/"rich" agreement. The strength is inherent and can be realized morphologically, but it can also be abstract.

The current account distinguishes between referential and non-referential subjects, since it appears that languages can differ in their treatment of these two subject types (although they do not have to). Thus German, for instance, allows null non-referential (expletive) subjects but disallows the omission of referential subjects (Note that the opposite case, where only referential but not non-referential subjects can be omitted, is not attested, Vainikka and Levy 1999). Hence, I adopt Rizzi's (1982, 1986) account for mixed cases like the one attested in German: Omission of non-referential subjects requires only licensing, but not identification, as there is no content/reference to be recovered. Non-referential pronouns thus make less "demands" on their omission than referential ones, as the omission of the latter requires both licensing and identification. Hence, once the language licenses a null subject, or rather, in Rizzi's (1986) terms, incorporates AGR/INFL in the set of its licensing heads, null non-referential subjects are licit. I adopt Rizzi's proposal that English-type languages differ from other languages in that the English AGR/INFL is not a licensing head. Hence this type of languages does not allow any kind of null subject, whether referential or non-referential.²⁰

Let us now turn to referential subjects. I suggest that UG offers three combinations of person-feature strength: (i) Strong person features in all three persons; (ii) Strong person features in the first and second persons, but not in the third person, and (iii) Weak person features in all three persons. Note that the possibility of strong person features only in the third person, but not in the first and second persons, does not exist due to pragmatic reasons, as suggested by Vainikka and Levy (1999). The account predicts three patterns of referential subject omission in the languages of the world:

- (i) Null referential subjects in all persons, identified by a strong AGR whose strength derives from the strong person features it bears (e.g., Italian-type languages and Korean-type languages);

²⁰ In line with Rizzi (1986), the strength of person features (i.e., identification) seems to be irrelevant for the setting of the Null Subject Parameter in English-type languages that do not license null subjects at all: Once licensing is illicit and non-referential subjects cannot be omitted, *a fortiori*, phonetically realized referential subjects are obligatory. This means that for some languages, the parameter only has to do with licensing, rather than with the interaction between licensing and identification. If, in due course, licensing becomes possible in that language and the subparameter is reset, the identification subparameter will have to be set in order to distinguish between the different language types.

- (ii) Null referential subjects only in first and second persons, but not in third person. This pattern can be attested in languages where only the first- and second-person features are strong, while the third-person feature is weak (e.g., Hebrew-type languages);
- (iii) Null referential subjects are impossible in all persons. This pattern can be seen in languages that have weak person features in all three persons, i.e., the weak AGR is unable to identify a null referential subject in all persons (e.g., German-type languages).

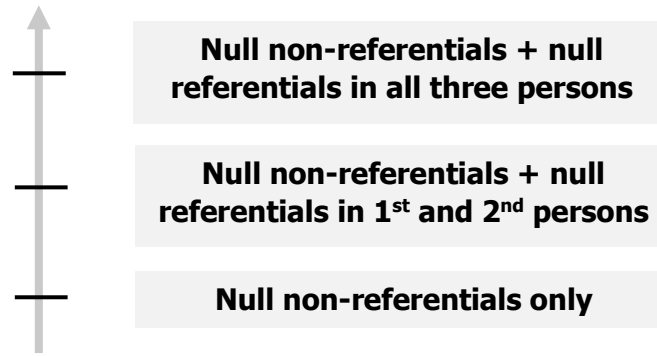
The interaction between syntactic licensing and strength of person features (i.e., identification) is demonstrated in table (2) below.

(2) Subject Omission Contingent upon (the Interaction between) Syntactic Licensing and Person Feature Strength

Syntactic Licensing	Yes			No
Possibility of Non-Referential Subject Omission	Yes			No
Person Feature Strength	Strong Person Features	Strong 1 st and 2 nd Person Features; Weak 3 rd Person Feature	Weak Person Features	Irrelevant
Possibility of Referential Subject Omission	Yes, in All Persons	Yes, in 1 st and 2 nd Persons Only	No	No
Example	Italian, Korean	Hebrew, Finnish	German	English, French

The analysis suggests a hierarchy of subject omission, deriving from the interaction between syntactic licensing of null subjects and person feature strength. The minimal subject-omission pattern is that of non-referential subjects only. Higher in the hierarchy, we can find subject omission that involves both non-referential subjects and referential first- and second-person subjects. The maximal omission pattern is found at the top of the hierarchy, as non-referential and referential subjects can both be omitted. This hierarchy is illustrated in figure (3) below.

(3) Subject Omission Hierarchy



The idea of licensing accomplished by a strong/"rich" AGR is reminiscent of Rizzi (1982, 1986), but I differ from Rizzi here in that only the person features are relevant, on a par with Vainikka and Levy (1999). Strong person agreement features do not have to be realized morphologically under the proposed account. Morphological agreement is not at issue here, but rather the pragmatic distinction between the different persons, with first and second persons being inherently stronger than the third person, due to the "stronger" role of the former in discourse.

In line with Rizzi (1982, 1986), the proposed parameter is thus comprised of two, hierarchically ordered, subparameters (or microparameters, in Kayne's 2000 terminology). The first deals with licensing: Does the language license null subjects? Yes/No. Once this subparameter is set to "No," the Null subject Parameter is set. However, if the licensing subparameter is set to "Yes," a second subparameter, that would enable (or disable) the identification of the referential null subject, is to be set: Are person features strong? Yes/No.²¹

It remains unclear what determines the omission of the expletive and its phonetic realization, as it seems that the null and the phonetically realized pleonastic subjects appear in the same environments. This is unaccounted for by all of the proposals surveyed here, and the reason for this fluctuation between phonetic and null expletives may very well be due to a change Hebrew is currently undergoing, turning from a (partial) null-subject language into a non-null-subject one.²²

²¹ In fact, this subparameter can bifurcate into: 'Are first- and second-person features strong?' and 'Are third-person features strong?,' as shall be shown in the following section.

²² This is also seen in the discrepancy between subject omission in the future and in the past: the former is significantly less productive than the latter (see Berman 1990 for more details).

2.3.4. The Null Subject Parameter in L1 Acquisition

In terms of the acquisition of the Null Subject Parameter, the proposed analysis predicts that the omission of non-referential subjects in the input the child is exposed to would trigger the setting of the licensing subparameter to "Yes." On the other hand, the detection of phonetically realized expletive elements in a variety of constructions (i.e., existential constructions, weather constructions and extraposition constructions), would set this subparameter to the negative value, and the setting would be completed.²³ In case the licensing subparameter is set to a positive value, the child has to set the identification subparameter, i.e. s/he has to figure out the strength of the person features in his/her language. Here I adopt Vainikka and Levy's (1999) predictions. They argue that omission of third-person subjects in finite canonical matrix clauses would trigger the learners to identify their L1 as a uniform null-subject language (e.g., Italian). I would like to add an additional trigger for fully null-subject languages, based on Rizzi's (1982) observation that in null-subject languages, "unstressed subject pronouns are obligatorily deleted (alternatively, are not phonetically realized)" (ibid., p. 68). Hence, positive evidence of only stressed third-person pronouns should also trigger the setting of the identification subparameter to "Yes." This coheres with the proposed analysis: if third-person subjects can be omitted, and are only pronounced when stressed, third-person features are necessarily strong. Once this fact is determined, it is clear that all person-features are strong, since UG offers no option for strong third-person features alongside weak first- and/or second-person features. Thus, the moment the child establishes that third-person features are strong in his/her language, it is automatically inferred that all person features are strong. This inference is further reinforced by the omission of first- and second-person subjects in finite canonical matrix clauses, alongside the phonetic realization of these pronouns only when stressed.

As for the other language types, here I diverge from Vainikka and Levy (1999), who suggest that phonological resemblance between the verbal paradigm and the pronouns in first and second persons, and the lack of such resemblance in third person, would serve as a trigger for the children to establish their language as

²³ The crucial role of expletives in setting this subparameter was stressed in Hyams (1986) as well.

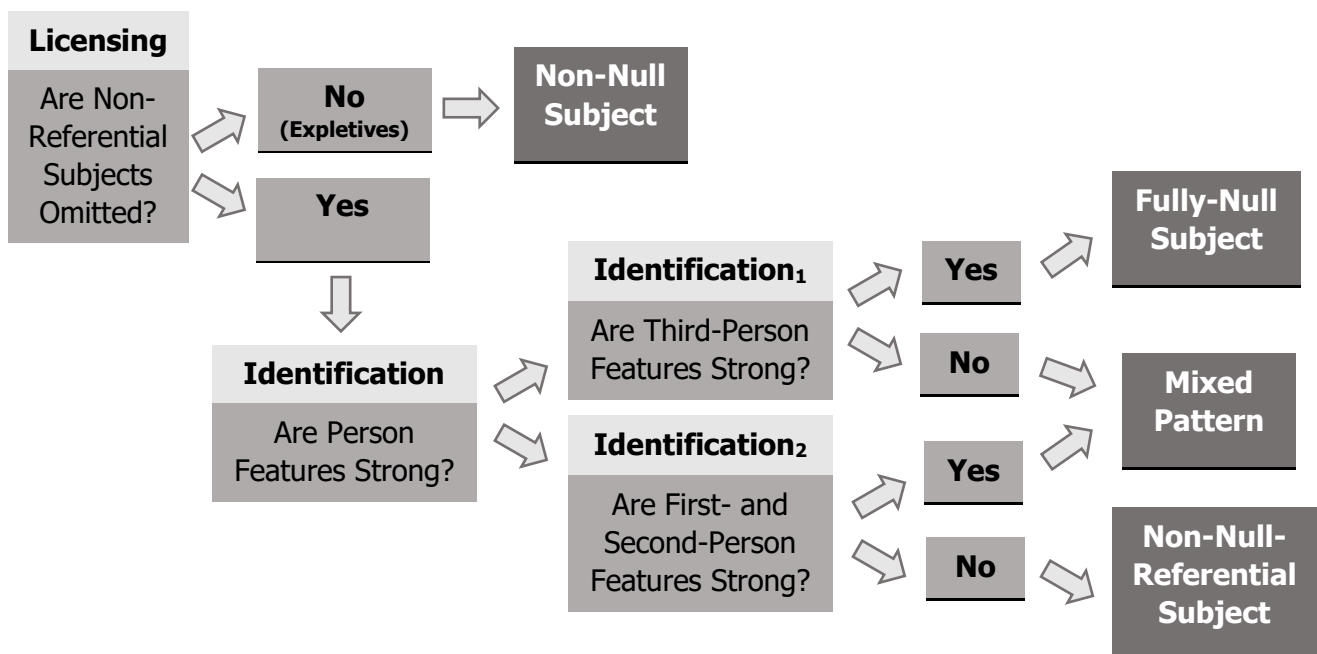
a mixed null-subject language of the Hebrew type. I find the morpho-phonological explanation less appealing since it is unrelated to the generalization regarding the inherent person feature strength in the first and second persons. If acquisition were triggered by morphological resemblance, the role of the person feature generalization would be less clear, as this generalization would not affect the acquisition of mixed null-subject languages. Hence, I apply the same trigger that set the subparameter of third-person feature strength: omission of first- and second-person subjects in finite canonical matrix clauses, alongside both stressed and unstressed first- and second-person pronominal subjects, would set the subparameter of first- and second-person feature strength to the positive value. However, the third-person feature would be determined as weak ("No"), due to lack of omitted third-person subjects, alongside stressed and unstressed third-person pronominal subjects. The possibility for omission in first and second persons, as opposed to the morpho-phonological marking, tallies with the generalization regarding the inherent strength of these two persons, which is motivated by pragmatic reasons, as stated in the previous section (e.g., Ariel 1990, Vainikka and Levy 1999).

On the other side of the coin, the total lack of omission in first and second persons would trigger the learners to identify their L1 as a uniform non-null-referential-subject language (e.g., German). This coheres with the proposed analysis: if first- and second-person subjects cannot be omitted, first- and second-person features are necessarily weak. Once this fact is determined, it is clear that all person-features are weak, since UG offers no option for weak first- and second-person features alongside a strong third-person feature. Thus, the moment the child establishes that first- and second-person features are weak in his/her language, it is automatically inferred that all person features are weak. This inference is further reinforced by the lack of omission of third-person subjects in finite canonical matrix clauses, alongside the phonetic realization of these pronouns both when stressed and when unstressed.

The Null Subject Parameter formulated here is thus hierarchical in structure as the child first differentiates between languages which license non-referential subjects and languages that do not. After establishing that, the child distinguishes between uniform null-subject languages, mixed null-subject languages and uniform non-null-referential-subject languages (which allow only null non-referential

subjects). This distinction is achieved via the (im)possible omission of subject pronouns, alongside their phonetic realization (only) when stressed. These cues, which are found in abundance in the input the child is exposed to, guide the child in determining the strength of the person features in his/her language. The person feature strength can be either uniform or mixed. Uniformity can be realized either as across-the-board weakness (e.g., German) or as across-the-board strength (e.g., Italian). The mixed person feature strength gives rise to the mixed null-subject languages, in which first- and second-person features are strong while the third-person feature is weak (e.g., Hebrew). The proposed hierarchy is illustrated in (4):²⁴

(4) *The Acquisition of the Null Subject Parameter: Hierarchical Subparameter-Setting*



I shall now turn to some of the Hebrew acquisition studies concerning the Null Subject Parameter. Research on the acquisition of this parameter in Hebrew as an L1 has not been extensive. In general, the studies that have dealt with the null subject phenomenon adopt the Principles and Parameters model.

²⁴ The hierarchical structure I assume for the parameter reflects the hierarchy of subject omission discussed earlier (cf. figure 3 in the previous section: 2.3.3). Nevertheless, it does not necessarily entail a chronological setting of the subparameters of licensing and identification. It may very well be the case that in fully null-subject languages for example, all of the cues (i.e., null non-referential subjects and null referential subjects in all persons alongside stressed referential pronominal subjects in all persons) are available to the child at the same time, thus enabling him/her to determine the setting of both subparameters simultaneously.

Berman (1990) accounts for the non-uniform pattern of subject omission attested in Hebrew via different types of null-subject licensing. She extends Huang's (1984) distinction between (1) syntactic licensing and (2) discourse licensing, subdividing the former into (1a) clause-internal morphological licensing and (1b) interclause anaphoric licensing, and the latter – into (2a) situational licensing, (2b) narrow-discourse licensing and (2c) licensing via topic maintenance in extended discourse. Berman offers a rather flexible version of the Null Subject Parameter. According to her (and contrary to Hyams 1986), children do not start with a single unmarked setting provided by UG, but rather "entertain any of the possible construction types attested in natural languages – analogously to the unrestricted phonemic inventory of young infants" (Berman 1990:1160). Based on Berman's Hebrew-acquisition study, she deduces the following developmental path for the Hebrew-speaking child who acquires the Null Subject Parameter:

- (i) *pro*-drop across the board (allowed by situational licensing and narrow-discourse licensing; cf. 2a-b above);
- (ii) *pro*-drop in rich agreement environment (allowed by morpho-syntactic clause-internal licensing, i.e., inflectional agreement; 1a);
- (iii) *pro*-drop in coordinate and subordinate clauses (allowed by syntactic interclause anaphoric licensing; 1b);
- (iv) *pro*-drop as a device for distinguishing topic maintenance from topic shift (2c)

If we consider the analysis proposed earlier, the findings seen in Berman (1990) do not necessarily serve as counterevidence for a default, unmarked value of the parameter. It may very well be that the licensing subparameter and the identification subparameter (pertaining to all persons) are preset to the positive value, giving rise to a fully-null-subject language in the primary stage of acquisition. When more input is absorbed, the subparameters are reset in accordance with the language which is being acquired. In Hebrew, the licensing subparameter does not require a resetting, as Hebrew licenses null subjects. The identification subparameter, on the other hand, has to be reset to the negative value concerning third-person strength. This resetting leads to the mixed setting manifest in Hebrew: "Yes" for first- and second-person features versus "No" for third-person features.

Elisha's (1997) cross-sectional study of the acquisition of subject omission in L1 Hebrew presents findings showing that young children (aged 1;9-2;0)

ungrammatically omit subjects in roughly 40% of their productions. After this stage they gradually approximate the adult pattern of subject omission. Elisha's premise is that until less than 100 years ago, Hebrew was a uniform null-subject language, giving rise to null subjects in all persons including the third person. Accordingly, only the present tense has to be explained, leaving the impossibility to omit third-person subjects in the past and future tenses unaccounted for. However, contemporary native Hebrew speakers do not share Elisha's intuitions concerning the possibility to omit subjects in the third-person past and future (Levy and Vainikka 1999/2000).

Levy and Vainikka (1999/2000) conduct a longitudinal study, during which they collect data from three Hebrew-speaking children. The researchers inspect the development of the inflectional paradigm for the various tenses and persons, the distribution of NP subjects in the different persons and tenses and grammatical person in the pronominal system. The findings show that the mixed null-subject system of Hebrew is already approximated before or around the children's second birthday (age 1;11-2;1). By this age children demonstrate the acquisition of other grammatical phenomena: tense and agreement, as well as person distinction in the pronominal system for all three children (one of the children's acquisition of person agreement was a little delayed: at the age of 2;1).

Vainikka and Levy's (1999) syntactic mechanism suggests that the person agreement affixes and the distribution of null subjects reflect the same phenomenon: the setting of the Null Subject (sub)Parameter(s). It thus predicts that in Hebrew-type languages, person agreement on the verb would be acquired at the same time as the mixed null subject system. Two of the children who participate in Levy and Vainikka's (1999/2000) study indeed demonstrate person agreement and a mixed null subject system at the same stage of acquisition. However, the prediction is not borne out in the case of the third child, who acquires person agreement after acquiring the mixed null subject system. The researchers note that the data recorded from this child were collected in book-reading situations, which are contextually restricted, and might have encouraged a different kind of productions. The data from the other two children came from various home situations in the presence of other members of the family. The different contexts in which the children were audio-recorded may thus serve as a confounding factor in the study. In any event, the proposed analysis coheres with the results seen in all three children, as it does not predict person agreement and subject omission to be acquired at the same time.

Levy and Vainikka (1999/2000) note a possible problem in the paucity of both second-person pronouns and second-person verb forms, observed in all three children (this was also seen in Berman 1990). If determining that first- and second-person verb affixes and pronouns are phonologically related is a crucial trigger for the mixed systems, as proposed by Levy and Vainikka, the scarcity of second person forms does not cohere with the (rapid) acquisition of the mixed system. Levy and Vainikka suggest that children must understand second-person forms, although they do not produce them, because these forms are consistently used to address children (as well as adults). Although there is no evidence for this explanation, the logic behind their argument is quite convincing. Nevertheless, under the current analysis, these findings do not form any problem, as the acquisition of the null subject system does not (necessarily) predict the acquisition of the morphological paradigm.

2.3.5. The Null Subject Parameter in L2 Acquisition

Sauter (2002) surveys a variety of studies done on the Null Subject Parameter in L2 acquisition among speakers with miscellaneous null-subject L1s (Spanish, Italian, Greek, Turkish, Korean, Japanese and Chinese), who are learning non-null-subject L2s (either English or German). Her conclusions are as follows (Sauter 2002: 43-44):

1. During early interlanguage stages, and often beyond, native speakers of null-subject languages learning non-null-subject languages omit both thematic and expletive subjects. This can be taken as an indication of transfer from their L1s, which enable null subjects (i.e., full/partial transfer).
2. Variation in the rates of missing subjects is observed among individual L2 learners of English and German. Nevertheless, all these L2 learners produce less subjectless sentences in the interlanguage than in their native languages, from an early stage. This indicates that L2 learners are, to some extent, sensitive to target language input containing overt subject pronouns, and that they are aware that null subjects are not used as freely in the target language as in their own L1s.
3. Spanish, Italian and Greek learners of English and German accept *that*-trace sequences, which are grammatical in their L1s, but not in their L2s. This suggests transfer of an L1 feature, but it is unclear whether this property is part of the cluster associated with the Null Subject Parameter or whether it is acquired independently (cf. section 2.3.2 for the behavior of Hebrew in this respect).

4. Spanish, Italian and Greek learners show very little evidence (if at all) of post-verbal subjects in declarative sentences. It is thus unclear whether transfer of this property takes place, and whether this property is part of the cluster associated with the null-subject parameter.
5. In adult L2 acquisition of English and German, there is no correspondence between the decrease in null subjects and the emergence of verbal agreement inflections. Thus adult L2 acquisition does not cohere with child L1 acquisition. In terms of child L2 acquisition, the interaction between missing subjects and agreement inflections remains inconclusive.

The Null Subject Parameter has not, to my knowledge, been checked among L2-ers whose L1 is Hebrew. The present study aims to do so. Points 1, 2 and 4 above are addressed.

3. LEARNABILITY

If the poverty of stimulus is assumed in L1 acquisition, it is without a doubt a prominent characteristic of the L2 learning process. The input, whether naturalistic or pedagogic, is insufficient in order for the learner to arrive at the relevant distinctions. This poses a learnability problem. And yet, interlanguage grammars do change, and parameters prove capable of being reset (White 2003). Thus, a theory that accounts for L2 acquisition is a "transition theory," as Gregg (1996) terms it, and hence must assume triggers that instigate language development and processes of change. These triggers must be unambiguous, predetermined cues (presumably structural properties) that will enable the language acquirer to determine the appropriate parameter value (White 2003). White deduces that while these cues may account for parameter setting in L1, they do not guarantee parameter (re)setting in L2, as L2 learners will not necessarily recognize them as cues. This results from ambiguous input, which may be consistent with more than one parameter setting. In the case of English, for example, the following sentence is ambiguous, since it may be consistent with both a positive and a negative value of the Null Subject Parameter (in particular, the licensing subparameter):

(1) Where was there an earthquake?

Since *there* is equivocal in English, functioning both as a locative adverb and as a meaningless expletive, the sentence can be interpreted in two manners. A Hebrew native speaker, for instance, may understand the sentence as equivalent either to (2) or to (3).

(2) *eyfo hayta šam re'idat adama?*

where was there.LOC a-shaking-of earth

'Where was there an earthquake there?'

(3) *eyfo hayta re'idat adama?*

where was a-shaking-of earth

'Where was there an earthquake?'

Interpretation (2) coheres with a language that licenses null subjects (at least non-referential ones), whereas interpretation (3) confirms the opposite setting for the licensing subparameter, indicating that non-referential subjects cannot be omitted.

The above sentence is thus ambiguous, as it may be analyzed in two different ways, giving rise to two different parameter settings.

According to the proposed analysis, expletives are the only cue required to change the setting of the Null Subject Parameter from the Hebrew value into the English value. The current study suggests that providing the cues for parameter resetting, together with emphasizing them, might instigate the desired change among L2 learners.

3.1. Positive Evidence

Positive evidence provides the language learner with information about grammaticality in L2: the learner can infer what utterances and which structures can be produced in the language being acquired. While L1 acquisition is based almost entirely upon positive evidence (as negative evidence proves to be inefficient, e.g., McNeill 1966, Brown and Hanlon 1970), L2 acquisition is less so, as the naturalistic data the L2 learner is exposed to can be far more restricted than the input during L1 acquisition.²⁵ Moreover, even manipulating the input by providing ample evidence required for the parameter resetting has proven to be insufficient (e.g., White 1991, Trahey and White 1993). Hence positive evidence alone seems to be inadequate when it comes to triggering grammar change in L2 acquisition. This might suggest that L2 learners are less attuned to the cues needed for grammatical change than their L1 peers, what may account for the different results each of them achieve.

3.2. Negative Evidence

Negative evidence provides the language learner with information about ungrammaticality. It can be direct, in the form of corrections or grammar teaching that explicitly state which structures are ungrammatical in the language being acquired. Such data are metalinguistic and do not form part of the naturalistic input. But negative evidence can also be indirect, in case the learner recognizes that certain structures are absent from the input, and can infer the appropriate parameter value

²⁵ I refer here to cases like English learning by Hebrew-speaking children, to be inspected in the current study, rather than to cases of immigrants acquiring a second language. Needless to say, the latter encounter a substantially larger amount of positive evidence, which is more similar to the input in L1 acquisition.

(Chomsky 1981).²⁶ If the theory proposes that triggers for parameter (re)setting have to be part of the primary, naturalistic input (as is the case in L1), direct (explicit) negative evidence cannot trigger parameter resetting, since it is not naturalistic. However, indirect negative evidence does form part of the naturalistic data, and can thus instigate grammatical change.

Inspecting the Verb Movement Parameter among French-speaking English learners, White (1991) finds that form-focused classroom instruction, including direct negative evidence, proves to be more effective in helping L2 learners to arrive at the appropriate parameter value than positive input alone. However, this knowledge is not retained in the long run. Moreover, not all of the features associated with the parameter are acquired once the parameter is reset. This may mean that the parameter was never reset, and that the negative evidence did not affect unconscious linguistic competence. Rather, the L2 learners made generalizations about the language that were not grammar-based, but formed part of a separate system of learned linguistic knowledge (Schwarz 1993).

As for indirect negative evidence, White (2003) argues against its efficacy because of its vagueness and its inconsistency with the results from White (1991).

3.3. Learnability and the Null Subject Parameter

In terms of the Null Subject Parameter, positive evidence is found in abundance in the English input during L2 acquisition: almost every sentence in English demonstrates an overt subject and a subject-verb order. However, expletive elements are less common, especially in early stages of the L2 acquisition.

Hyams (1986) argues that expletive elements may serve as the trigger to change the parameter default value [+null subject] into the other setting [-null subject] in L1 acquisition, as expletives exist solely in non-null-subject languages. The current analysis coheres with Hyams with regard to the role of pleonastic elements. If that is indeed the case, expletives constitute the property that L2 learners must be exposed to often, as this property may be the cue that will instigate

²⁶ White (2003) states that such a proposal can hold only if the language learner "knows what to look for (i.e., has a reason for checking whether something is missing)" (p.165). If indeed L2 learners are less attuned to triggers appearing in the naturalistic data they are exposed to, it is difficult to account for their sensitivity to missing structures or elements.

grammar change. Relying on this hypothesis, it is precisely the existence of expletive elements which was stressed in the current study, being associated with the parameter's cluster of features.

The study thus inspects the effect of both positive evidence and explicit positive evidence upon parameter resetting.²⁷ The texts which were taught in both classes included significantly more expletive elements than the amount that can be found in spontaneous speech (positive evidence).²⁸ Moreover, one of the classes was explicitly taught about the function and the (lack of) meaning of expletives, comparing English to Hebrew in this respect (explicit positive evidence). The idea was that explicit positive evidence might instigate the resetting of the Null Subject Parameter in the L2 (English). The following section provides the specifics of the study that was conducted.

²⁷ By "explicit positive evidence" I refer to descriptive information about the language delivered in a tutored environment, as was termed by Schwartz and Gubala-Ryzak (1992).

²⁸ I realize the term "significantly more expletive elements than the amount that can be found in spontaneous speech" is vague. In the study I examine the influence of exposure to a numerical, more concrete, amount of such elements upon the resetting of the parameter. See section 4.2.1. for further details.

4. METHOD

4.1. Participants

4.1.1. Pretest

I started out with 121 6th-graders from two elementary schools in Tel Aviv. I had to take out 7 Hebrew/English and Hebrew/French bilinguals, since English and French both have the parameter setting I was hoping to trigger (that is, the opposite parameter value to the one found in Hebrew). 8 additional subjects who guessed on the pretest were deducted, leaving me with 106 subjects: 45 girls and 61 boys.

All of these participants were monolingual Hebrew-speakers, who have been studying English since 2nd grade. Their mean age was: 11;6. 16 of these participants were diagnosed with learning disabilities, a point I will return to in sections 5.1.1.1 and 5.1.2.1 when I present the results of the between-subjects analyses.

4.1.2. Posttest

Starting out with 106 participants who took part in the pretest, I had to take out 23 participants that perfectly mastered all of the properties of the parameter on the pretest. I then deducted 14 additional subjects who either guessed on the posttest or were missing the day I tested their class. That left me with 69 subjects: 27 girls and 42 boys. Their mean age was: 11;6. Within the group of 69 subjects, 12 were diagnosed with learning disabilities (cf. sections 5.2.1.1, 5.2.2.1 and 5.2.3.1).

4.1.3. Post-Posttest

Out of the 69 participants who took part in both the pretest and the posttest, I had to take out 6 additional pupils, who either guessed on the post-posttest or were absent from school the day I tested the classes for the third time. 63 participants remained: 26 girls and 37 boys. Their mean age was: 12;0. 11 of them were diagnosed with learning disabilities (cf. sections 5.4.1.1, 5.4.2.1 and 5.4.3.1).

4.2. Materials and Stimuli

4.2.1. Teaching Materials

Three texts were created specifically for the purpose of teaching the phenomenon of the Null Subject Parameter. The texts include three of the features associated with

the parameter: expletive elements, lack of null thematic pronominal subjects and lack of post-verbal subjects. Here is an excerpt taken from one of the three texts (cf. Appendix I for the complete teaching materials):

*In a kingdom far, far away, **there** lives a kind prince. The prince lives in a beautiful palace because he is very rich. In the palace **there** are 25 rooms, and in each room **there** is a lot of gold.*

*One day, the prince notices that **there** are many clouds in the sky. Then **it** starts raining. **It** doesn't stop raining for a few hours. In the middle of the night, the prince hears a knock on the door. He thinks the noise is coming from the storm, because **it** is very windy outside. The prince decides that the rain or the wind are making the noise, but then **there** is another knock. **It** is night, and all the servants are sleeping...*

The expletive elements are put in bold for the sake of presentation, but the pupils received a plain text. It is evident from this excerpt that the amount of expletive elements interwoven in the texts is larger than the one found in spontaneous speech (natural positive evidence), and even in texts the pupils encounter in school. Together, the texts include 34 expletive elements: 17 instances of *it* and 17 instances of *there*.

Recall that out of the three features incorporated in the texts, it was only the existence of the expletives *it* and *there* that was supposed to stand out as "different," since the L1 Hebrew does not require and in certain cases disallows an *it*-type element (*ze*) and never allows an expletive in *there*-type constructions. That is, only the expletive elements served as the positive evidence that might have triggered the resetting of the parameter. The other two constructions – phonetically realized thematic subject pronouns and preverbal subjects – do appear in the participants' L1.

4.2.2. Tests

Two test versions were created specifically for the purpose of testing the acquisition of the Null Subject Parameter in L2 English. Three of the parameter features were examined:

- a) The obligatoriness of expletive elements
- b) The obligatoriness of referential pronominal subjects
- c) The impossibility of post-verbal subjects

Both versions consisted of a single task: translation choice. The participants were required to choose the correct translation for a given sentence in Hebrew out of four translations into English. Each test version consisted of thirty questions:

- Six questions incorporating null expletive subjects parallel to the English *it* (1)
- Six questions incorporating null expletive subjects parallel to the English *there* (2)
- Six questions incorporating null referential subjects (3)
- Six questions incorporating post-verbal subjects (4)
- Six filler questions

yihye gašum be-xaifa hayom יהיה גשום בחיפה היום. (1)
will-be.3SG.MS. rainy in-Haifa today

- a. Will be rainy in Haifa today. (*null subject*)
- b. It will be rainy in Haifa tomorrow. (*lexical replacement*)
- c. Will be rainy in Haifa tomorrow. (*null subject + lexical replacement*)
- d. It will be rainy in Haifa today.

yeš kešet yafa ba- šama'im יש קשת יפה בשמיים. (2)
is a-rainbow beautiful in-the-sky

- a. Is a rainbow beautiful in the sky. (*noun-adjective order + null subject*)
- b. There is a rainbow beautiful in the sky. (*noun-adjective order*)
- c. Is a beautiful rainbow in the sky. (*null subject*)
- d. There is a beautiful rainbow in the sky.

(3) אני אוהבת סרטים, אז אלך לקולנוע מחר.

ani ohevet sratim az elex la- kolno'a maxar
I like.SG.FM. movies so will-go.1SG. to-the-cinema tomorrow

- a. I like a movie, so I will go to the cinema tomorrow. (*number replacement*)
- b. I like movies, so will go to the cinema tomorrow. (*null subject*)
- c. I like movies, so I will go to the cinema tomorrow.
- d. I like a movie, so will go to the cinema tomorrow. (*num. repl. + null subject*)

(4) יבואו שלושים אנשים לירושלים בשבוע הבא.

yavo'u šlošim anašim le-yerušala'im ba- šavu'a ha- ba
will-come.3PL. thirty people to-Jerusalem in-the-week the-next

- a. Thirteen people will come to Jerusalem next week. (*lexical replacement*)
- b. Will come thirteen people to Jerusalem next week. (*lex. repl. + post-verbal sub.*)
- c. Thirty people will come to Jerusalem next week.
- d. Will come thirty people to Jerusalem next week. (*post-verbal subject*)

Each Hebrew sentence had four possible translations into English, including a correct translation and three mistaken translations: (i) One that derived from the experimental manipulation (i.e., either a null subject or a post-verbal subject); (ii) One that derived from a lexical replacement of one of the words in the sentence (see examples 1 and 4 above), from an ungrammatical noun-adjective or adjective-adverb order (see example 2) or from an ungrammatical/inaccurate singular-plural replacement (see example 3), and (iii) One that derived both from the experimental manipulation and from a lexical/order/number replacement.

It is important to note that the property of expletive elements was slightly different from the other two properties, since it involved two different structures. The expletive *it* was incorporated in weather contexts, whereas the expletive *there* appeared in existential sentences.²⁹ I have chosen to bifurcate the property of expletive elements into *it*-sentences (cf. example 1 above) and *there*-sentences (cf. example 2 above) since I anticipated different results in the two structures, a prediction that was indeed borne out (see the within-subjects analyses in section 5). This decision was based on my knowledge, drawn from discussions with English teachers, that existential structures are emphasized by teachers from an early stage, while weather constructions are stressed to a lesser extent (if at all).

Only six fillers were incorporated in each version of the test, since the three features gave rise to very different structures, as can be seen in examples (1)-(4) above, and thus the sentences used to examine every feature could serve as fillers for the others (cf. Appendix II for the comprehensive list of questions that comprised the tests). Although fillers were uncalled for in the given circumstances, I have chosen to include them in the tests in order to detect participants who guessed the answers, merely circling translations at random. Those participants were excluded

²⁹ Needless to say, these two expletives can appear in additional constructions: e.g., raising (i), passive (ii), extraposition (iii) and *there*-insertion unaccusatives (iv). I have focused only on weather and existential constructions in this study for the sake of simplification, as the latter do not incorporate embedded clauses and belong to a common, daily register, unlike (i)-(iii) and (iv), respectively, which are too complex for the participants at this point in their studies.

(i) It seems that John is successful. | (iii) It surprised me that an angel appeared in my dream.
(ii) It is said that John is successful. | (iv) There appeared an angel in my dream.

from the statistical analyses (as noted above in section 4.1). In each version, three fillers resembled the sentences incorporating null referential subjects, and the other three reflected the sentences involving post-verbal subjects. The resemblance was only seen in the syntactic structure, as the filler sentences included neither null nor post-verbal subjects (i.e., they were unaffected by the experimental manipulation).

4.3. Design

Translation is argued to be a task that demands non-linguistic conceptual knowledge, such as coherence, rhetorical skills and implementation of contextual information (e.g., Machida 2011 and Kemp 2013). As such, a translation task might be considered an inappropriate tool when seeking to establish the nature of the L2 learner's linguistic competence.

However, as the examples in the previous section show, the task described above was not a translation task. The participants were not required to translate anything, but rather, to *choose* one translation out of four possible options. The sentences were given both in the source language (Hebrew) and in the target language (English), and for every Hebrew sentence, the participants were required to *judge* which English translation was the most suitable one. The task used in this study thus elicited intuitional data, reminiscent of grammaticality judgments, rather than production of translations.

As for production in general, not necessarily that of translations, I chose not to inspect the participants' competence via elicitation of productions since comprehension normally precedes production in L2 acquisition (e.g., Krashen & Terrell 1983 and Ringbom 1992). Based on previous studies that examined the Null Subject Parameter, I saw that intuitional data were able to detect the instabilities found in interlanguage grammars in places where production data failed to do so. For example, studies investigating learners coming from non-null-subject backgrounds and acquiring null-subject L2s reported, based on elicited production, that no overt expletive subjects were produced (e.g., Phinney 1987, Montrul and Rodríguez Louro 2006). In contrast, grammaticality judgment and correction tasks observed acceptance of ungrammatical overt expletive subjects alongside acceptance of grammatical null expletive subjects (e.g., Liceras 1989, Lantolf 1990). This shows that the fact that L2-ers did not *produce* overt expletives in null-subject L2s does not

necessarily indicate that they had internalized the impossibility of these constructions. Intuitional data thus prove to be a more sensitive device to probe the subtleties and the variability in L2/interlanguage competence.

The discrepancy between production and comprehension was also observed among the participants in the current study. I knew in advance that the participants' proficiency level in English was not high and, based on the few lessons I delivered to them, I could see that there was a huge difference between their comprehension and their production in English. It was very hard to elicit productions, and a considerable part of the pupils barely agreed to read out loud, let alone speak, in the L2. In addition, the production-comprehension imbalance was reinforced in the English classes the participants took part in prior to the study, from the moment they began learning English, as production was practiced less than comprehension.

For the reasons I have just enumerated, the translation-choice task seemed the most appropriate for the data I aspired to achieve. My desire to establish whether the learners know that certain forms are impossible or ungrammatical in the L2 (i.e., English) could not have been fulfilled via elicited production, which would have been almost impossible to attain, and even if attained, could not have provided me with an accurate picture of the L2 competence the way intuitional data could. Furthermore, translation, even in writing, would risk the incorporation of skills that have nothing to do with the participants' linguistic competence (e.g., coherence), while I endeavored to leave out such knowledge when inspecting "purely" linguistic competence.

Aside from the choice of task, I controlled for several issues in the design of the experiment.

First, the Hebrew sentences in every feature (null *it*, null *there*, null referential subject and post-verbal subject) were controlled for length in terms of word number, as well as for their syntactic structure. Moreover, the translation options for every feature were controlled for visual length, so that none of the answers would stand out as particularly short or long, thus biasing the participants' choice (see the examples above and/or Appendix II). The mistaken translation options were further controlled for mistake type, as described in the previous section. The order of the four translation options varied both between and within each feature.

Second, each test version had two variants which included the same questions in a different order. This was meant both to remove order effects, as well as to avoid possible cheating, since the children were sitting next to each other. The questions were pseudo-randomly ordered, so that no two consecutive questions concerned the same feature being under examination or shared the same order of translation options. Thus no two consecutive questions yielded the same answer (i.e., *a*, *b*, *c* or *d*). Moreover, the amount of answers of each type was relatively equal: out of thirty questions, *b* or *c* served as the correct answer for eight questions each (16 *in toto*), and *a* and *d* were the correct answers for seven questions each (14 *in toto*).

Third, the sentences incorporated in the tests included some of the vocabulary that appeared in the texts that were taught in class, but also additional vocabulary. Before each test, the participants were instructed to ask about the meanings of unfamiliar words during the test, as testing their vocabulary was not the issue in the current study.

Lastly, the test questions did not involve the past tense, which the pupils were not sufficiently familiar with at this point in their studies. Therefore, only the present tenses (Present Simple, Present Progressive) and the future tense (Future Simple) were included.

In addition to these general issues, I also made sure that the Hebrew sentences incorporating null thematic subjects and post-verbal subjects (hereinafter: *NTS* and *PVS*, respectively) would sound natural to the readers. Thus all of the Hebrew *NTS*-sentences provided the proper pragmatic context for subject omission. That is, the subject was overt in the beginning of the sentence in order to render omission pragmatically plausible. The subject was then omitted in the second part of the sentence. Omission would be grammatical without the antecedent as well, but the antecedent rendered the null subject more natural. Moreover, without the antecedent, first and second persons might have been perceived as imperative rather than future, since in Modern Hebrew, the future and the imperative forms of the verb have conflated (e.g., *telxu* means both 'go!' and 'you will go'). Furthermore, relying on the mixed null subject pattern observed in Hebrew, I did not incorporate any null thematic subjects in the third-person or in the present tense, as the omission of those would not be permitted in Hebrew. Concerning *PVS*-sentences, I

only used unaccusative verbs in this sentence type, as those license post-verbal subjects in Hebrew.³⁰

In order to make sure that the tests were free of typos and other confusing factors, I ran the tests on four 6th-graders before I tested the participants in the actual experiment (*pre-pretest*). All of them understood the task properly and managed to complete the test. Two of the four sixth-graders, one of whom was a Hebrew/English bilingual, had a high level of English and demonstrated top performance on all of the features under examination.

4.4. Procedure

First, in order to secure the pupils' cooperation, I told each class that they were in competition with the other class (four classes took part in the experiment: two from each school; in every school I told the two classes that they were in competition). I promised that the winning class, whose pupils demonstrated the best behavior and answered the largest amount of questions correctly, would receive a prize. After the last session, I handed out sweets to everyone, telling them there was a tie.

After the introduction, both classes were tested prior to the teaching sessions in order to make sure that the parameter value has not yet been set (this test will be referred to hereinafter as: *pretest*). Before the pupils started answering the pretest, I had instructed them as follows:

For every sentence in Hebrew, there are four translations into English. There is one translation that sounds good in English and is appropriate for the sentence in Hebrew. Circle it.

These instructions were written on the test itself, in Hebrew, but I also read them aloud – both in English and in Hebrew. I assured the pupils that this was not a test, that they would not be graded for it and that their teacher would not even know how well they did. This was meant to relieve the participants from any pressure, as I was instructed by the Head Scientist's Office of the Ministry of Education, who approved my proposal. I thus referred to the test as a "game" or a "charade," and the word "test" was not written on the tests themselves, nor was it mentioned in class.

³⁰ Passive verbs also allow post-verbal subjects, but they were not used since they were too difficult for the level of the students.

I asked the pupils to answer the "charade" as fast and as correctly as they could. I also asked them not to go back and check or change their initial answers, since I wanted to see what their first instinct regarding the correct answer was. In addition, since I did not know whether the vocabulary was familiar to all of the pupils, I told them to ask me about any word they did not understand.

After the pretest, the pupils from both schools were divided into two groups, and each group consisted of two classes: one from each school. Every group was taught two lessons (45 minutes each), during which the students from both groups were exposed to the same three texts (cf. Appendix I). It is important to note here that I used this short span of time due to the limitations imposed upon me by the Head Scientist's Office of the Ministry of Education. They were very strict about the amount of time they allocated for me to perform the experiment, and hence I had to reduce the amount of time initially planned in order to get their approval.

During the teaching sessions, the texts were read in class: I asked each child to read a sentence. I then explained unfamiliar words and asked the child that had read the sentence to translate it into Hebrew. After we had finished reading every text, the content of each text as a whole was discussed (cf. Possible Questions for Discussion at the bottom of each text in Appendix I). The texts were delivered according to their level: from the easiest to the hardest. Up to that point, both groups underwent the same process. The only difference between the two groups was that in one of them (hereinafter: *Group 2*) an emphasis was put upon the English expletive pronouns (*it* and *there*), their function and their (lack of) meaning. In the other group (hereinafter: *Group 1*), the expletives were not mentioned explicitly, but the children were merely exposed to them.

The explicit positive evidence (applied in Group 2) involved theoretical explanation and oral practice. I explained that expletive elements serve as the subject of the sentence, but that they do not have any meaning. I added that their form is ambiguous. Thus, when we ran into a sentence in the text that involved an expletive, I would write that sentence on the board (e.g., 5a and 6a) and underneath it I would write another sentence involving a meaningful version of that element (e.g., 5b and 6b), in the following manner:

- (5) a. **It** is very hot outside. *(meaningless)*
b. I am eating a cookie. **It** is tasty. *(meaningful)*

(6) a. **There** are many people at the beach. *(meaningless)*

b. Here is my bag. I will put my pen **there**. *(meaningful)*

I explained that the pronouns *it* and *there* are not translated into Hebrew in the *a*-sentences, as they are meaningless. However, in the *b*-sentences, I noted that the pronouns *it* and *there* do have a meaning in Hebrew, and hence should be translated.

Having explained this in Group 2, after every sentence that was read I would ask: "How do we translate it into Hebrew?", and if the sentence involved an expletive, I would also ask: "What didn't we translate here?" and the students would answer either "it" or "there." I would like to comment here regarding some of the existential constructions. When I asked what we did not translate in these sentences, the children did not always know the answer. I would then say that we did not translate *there*, which led to the response: "But *there* is *yeš*," with *yeš* referring to the Hebrew existential construction parallel to 'there is/are.' I would then retort that the verb *be* meant *yeš*, while *there* meant nothing. This shows that "there" was not an expletive for the participants, but rather part of a complete unit of meaning parallel to *yeš*: 'there-is/are.' I will return to this point when I present the results and discuss them (cf. sections 5.1.1.2 and 6.1).

Both classes were tested again a week after the teaching sessions, using a different but parallel version of the pretest (this test will be referred to hereinafter as *posttest*). Four months later, the participants were reexamined, using the initial test version (hereinafter: *post-posttest*). That is, one version of the test (A) was used both for the pre-teaching test and for the post-teaching test that took place four months after the teaching sessions (i.e., the pretest and the post-posttest). The other version (B) was used to test the participants immediately after the teaching sessions (i.e., the posttest). The period of four months was chosen since this was the maximum amount of time I had in order to retest the pupils before they finish grammar school and start Junior High. I knew they would then be scattered into different schools, and it would be impossible to track them down and test them again. I had only four months left since the approval of my proposal was delayed by the Head Scientist's Office of the Ministry of Education, and I could not start the study without the Ministry's authorization.

5. RESULTS

5.1. Pretest

5.1.1. By-Subjects Analysis for All Participants ³¹

5.1.1.1. Between-Subjects Analysis ³²

A 4X2 ANCOVA (covariate: English Grade) with Sentence Type (*It, There, NTS, PVS*) as a within-subjects factor and Learning Disabilities (Yes, No) as a between-subjects factor revealed no main effect for Learning Disabilities.^{33,34} This means that the performance of the children diagnosed with learning disabilities was not significantly different from the performance of the children without learning difficulties. As expected, parallel analyses with the between-subjects factors of List (Question Order 1, Question Order 2) and School (School 1, School 2) did not reveal a significant effect either. That is, the order of the questions did not affect the participants' performance, and neither did the school to which they belonged. However, a parallel analysis with Group (Group 1, Group 2) as a between subjects factor did reveal a main effect.³⁵ The group division was analyzed twice: once for all of the participants that took part in the pretest and once only for those who proceeded to the posttest. In both comparisons the differences were significant [All: $F(1,103) = 5.4, p = .022^*$;

³¹ The "by-subjects" or "by-informants" analysis summarizes the average accuracy of each subject/informant in each of the sentence types. The results presented here include only "by-subjects" analyses. See Appendix III, section I for the summary of the "by-items" or "by-materials" analysis, which compares the average accuracy of each item in each of the sentence types (Coward 1997).

³² The "between-subjects" or "between groups" analysis compares subjects that participate in different experimental conditions (or that belong to different groups). For example, in the current study, the participants can be divided into groups according to whether or not they are diagnosed with learning disabilities.

³³ The covariate was necessary since I could not control for the English level of the students in each class, having to adopt each school's division into classes. None of the classes was homogenous, and the English Grade covariate allowed me to account for some of the variance between the participants.

³⁴ A within-subjects factor is a factor regarding which all of the participants can be compared, whereas a between-subjects factor is a factor that divides the participants into groups.

³⁵ The Group factor was relevant only for the teaching sessions and the tests that followed them (the posttest and the post-posttest), as after the pretest, the participants were split into two groups, according to class division: One that I taught explicitly (Group 2) and one that I did not (Group 1).

Only Posttest: $F(1,66) = 4.89, p = .031^*$.³⁶ This was not a result I was hoping for, since I needed the two groups to be similar in order to conduct the second experiment. However, I could not resolve this issue since I had to use the school's division into classes, so my hands were tied in this respect. In the only-posttest comparison, Group 1 performed significantly better than Group 2 on 3 of the 4 sentence types (*It*, *NTS* and *PVS*), but the opposite was true for the remaining sentence type (*There*).

Based on the Group comparison, I chose to teach explicitly the group that achieved lower scores on the pretest (Group 2). Otherwise, if the group that had obtained higher accuracy levels from the start (Group 1) improved following explicit positive evidence, it could be argued that they improved due to their learning skills, rather than due to the input they were exposed to, as they were better pupils to begin with.

*5.1.1.2. Within-Subjects Analysis*³⁷

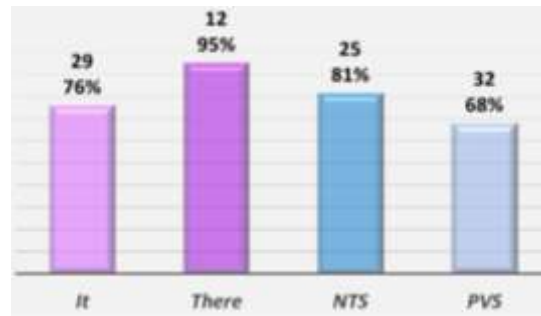
A repeated measures ANCOVA (covariate: English Grade) with only Sentence Type as a within-subjects factor (no between-subjects factors were used) revealed a main effect for Sentence Type [$F(3,309) = 7.31, p < .001^{**}$]. Mauchly's test indicated that the assumption of sphericity for Sentence Type had been violated ($p = .028^*$), therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity. The mean accuracy levels and standard deviations achieved in each sentence type are presented in figure (1) below.³⁸

³⁶ A single asterisk (*) signifies the correlation is significant at the 0.05 level, while two asterisks (**) signify that the correlation is significant at the 0.01 level.

³⁷ The "within-subjects" analysis compares subjects that participate in the same experimental conditions. Each participant is tested under each condition.

³⁸ For the distribution of participants in every accuracy level in each of the sentence types, see Appendix III, section I.

(1) Pretest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types



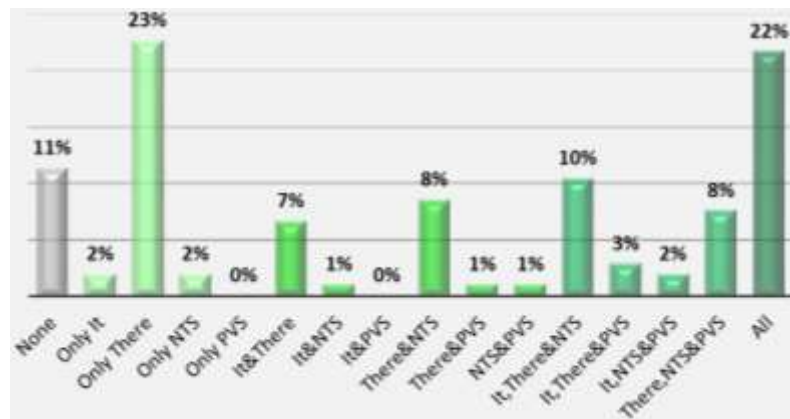
Not all sentence types were significantly different one from the other. The differences between both expletives – *it* and *there* – and *NTS* were highly significant [$F(1,103) = 17.77, p < .001^{**}$ and $F(1,103) = 18.77, p < .001^{**}$, respectively]. The participants mistakenly accepted significantly more ungrammatical *it*-less sentences than ungrammatical null thematic subjects. On the other hand, they wrongly accepted significantly more null thematic subjects than *there*-less sentences.

The differences between both expletives and post-verbal subjects were also significant [*It-PVS*: $F(1,103) = 6.27, p = .014^*$, and *There-PVS*: $F(1,103) = 5.45, p = .021^*$.] These contrasts show that the participants erroneously accepted significantly more mistakes of post-verbal subjects than null expletive subjects – both in weather and existential constructions.

Although *It* and *There* were not significantly different from each other, it is evident that the participants have gained full control over *There* with an average accuracy of 95%. That is, they correctly rejected the option of a null expletive in existential constructions with almost perfect accuracy. Regarding *It*, the participants did not master this sentence type in the same way, as they correctly rejected the null expletive option in weather constructions with only 76% accuracy. The differences in the standard deviations also manifest the instability of the *It*-sentences, in contrast with the relative stability in the *There*-sentences.

No strong correlations were detected between any of the sentence types. Moreover, inspecting the sentence types that were mastered perfectly (that is, those in which 6 out of 6 sentences were answered correctly), many possible combinations emerged, as presented visually in figure (2) below.

(2) Pretest Results: Percentages of Participants Who Performed Perfectly on the Different Sentence Types



5.1.1.3. Interactions³⁹

Only the interaction between Group and Sentence Type was highly significant [$F(3,309) = 7.76; p < .001^{**}$]. This interaction was significant for four out of the six contrasts between the different sentence types: *It-There*, *It-NTS*, *There-PVS* and *NTS-PVS*. This means that the differences between some of the sentence types were significantly larger for Group 2 (see graph 3 in section 5.1.2.2 below). The interactions between Sentence Type and the between-subjects factors of Learning Disabilities, List and School were insignificant.

5.1.2. By-Subjects Analysis by Groups, for Posttest Participants Only

5.1.2.1. Between-Subjects Analysis by Groups

Since the groups were significantly different from each other, it was important to look more closely at each of the groups. I examined the pretest results of only the 69 participants who proceeded to the posttest. The results from three 4X2 ANCOVAs (covariate: English Grade) with Sentence Type as a within-subjects factor and different between-subjects factors: Learning Disabilities, List and School, were split according to groups. The List factor did not reveal a significant effect in either of the groups, showing that the question order did not affect the participants' performance. However, both Learning Disabilities and School revealed main effects, only in Group

³⁹ An interaction occurs when an independent variable (in this case, each of the between-subjects factors: Group, Learning Disabilities, List and School) does not have the same effect on all levels of the dependent variable of interest (Sentence Type; e.g., the results of Group 1 in a certain sentence type differ from those of Group 2 in that sentence type, but the two groups achieve similar results in another sentence type).

2 [$F(1,33) = 4.97, p = .033^*$ and $F(1,33) = 4.27, p = .047^*$, respectively]. This means that the Group 2 participants that were diagnosed with learning disabilities reached lower accuracy levels than their peers without learning difficulties, in all four sentence-types. It also shows that the Group 2 participants that were taken from School 1 showed lower accuracy levels than their School 2 peers, in all of the sentence types.

5.1.2.2. Within-Subjects Analysis by Groups

The results from a repeated measures ANCOVA (covariate: English Grade) with only Sentence Type as a within-subjects factor (no between-subjects factors) were split according to groups, and both revealed a main effect for Sentence Type [Group 1: $F(3,93) = 3.57, p = .017^*$; Group 2: $F(3,102) = 3.22, p = .026^*$]. The mean accuracy levels and the standard deviations achieved in each sentence type, according to groups, are presented in figure (3) below.

(3) Pretest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types for Posttest Participants Only (by Groups)



Not all sentence types were significantly different one from the other. For both groups, the differences between both expletives – *it* and *there* – and *NTS* were highly significant [$F(1,31) = 4.99, p = .033^*$ and $F(1,31) = 14.52, p = .001^{**}$, respectively]. The participants in both groups mistakenly accepted significantly more ungrammatical *it*-less sentences than ungrammatical null thematic subjects. On the other hand, they wrongly accepted significantly more null thematic subjects than *there*-less sentences. The remaining contrasts were insignificant in both groups.

5.1.2.3. Interactions by Groups

The interactions between Sentence Type and the between-subjects factors of Learning Disabilities, List and School were insignificant for both groups.

5.2. Posttest

5.2.1. By-Subjects Analysis⁴⁰

5.2.1.1. Between-Subjects Analysis

A 4X2 ANCOVA (covariate: English Grade) with Sentence Type (*It, There, NTS, PVS*) as a within-subjects factor and Group (Group 1, Group 2) as a between-subjects factor revealed no main effect for Group. Recall that in the pretest, the difference between the two groups was significant, with Group 2 showing lower accuracy levels in 3 of the 4 sentence types (cf. section 5.1.1.1 above). This was before the pupils were exposed to explicit positive evidence. In the posttest, Group 2 still displayed lower accuracies than Group 1 in the same 3 sentence types (*It, NTS, PVS*), but the discrepancy between the two groups seems to have diminished – apparently due to the teaching of the weaker group (2).

5.2.1.2. Interactions

The interaction between Sentence Type and Group was insignificant for all of the within-subjects contrasts.

5.2.2. By-Subjects Analysis by Groups

5.2.2.1. Between-Subjects Analysis by Groups⁴¹

The results from three 4X2 ANCOVAs (covariate: English Grade) with Sentence Type as a within-subjects factor and different between-subjects factors: Learning Disabilities, List and School, were split according to groups. As expected, the List factor once again did not reveal a significant effect for both groups, proving again that the question order did not affect the participants' performance. In contrast with the pretest results for Group 2, Learning Disabilities did not reveal a significant effect either, for both groups (cf. section 5.1.2.1). That is, the performance of the children diagnosed with learning disabilities was not significantly different from the performance of the children without learning difficulties. However, the analysis revealed a main effect for School only in Group 2 (which received explicit positive evidence), on a par with the pretest results [$F(1,33) = 9.43, p = .004^{**}$, see section

⁴⁰ See Appendix III, section II for the summary of the by-items analysis.

⁴¹ See Appendix III, section II for the interactions in the analysis by groups and by schools.

5.1.2.1 again]. That is, Group 2 was extremely heterogeneous from the very start, with significant differences both between the pupils diagnosed with learning disabilities and the pupils that had no learning difficulties, and between the pupils taken from different schools (recall that in Group 1 the differences deriving from Learning Disabilities and from School were insignificant in the pretest). The teaching sessions appear to have removed the differences deriving from learning disabilities in Group 2, but the inter-school differences remained significant. Group 2, School 2 demonstrated better performance than School 1 on all sentence types (cf. graph 7 in section 5.2.3.2 below).

5.2.2.2. Within-Subjects Analysis by Groups

The results from a repeated measures ANCOVA (covariate: English Grade) with only Sentence Type as a within-subjects factor (no between-subjects factors) were split according to groups, and both revealed a main effect for Sentence Type [Group 1: $F(3,93) = 5.81, p = .001^{**}$; Group 2: $F(3,102) = 4.6, p = .005^{**}$]. The different accuracy levels and standard deviations achieved in each sentence type are presented in figure (4):

(4) Posttest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Groups)



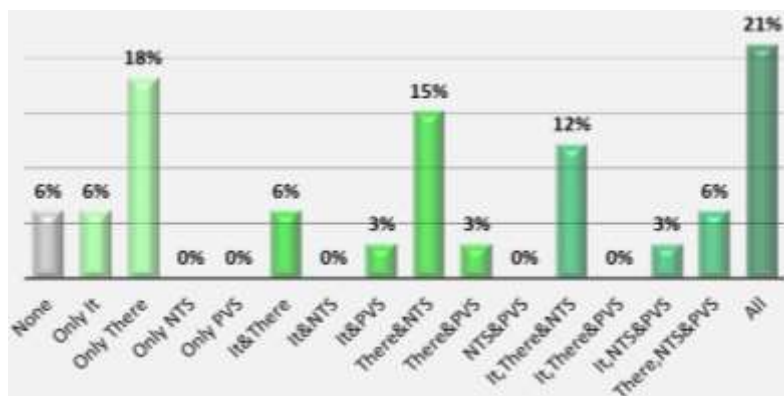
Not all sentence types were significantly different one from the other, and significance was not necessarily seen in the same pairs for both groups. The differences between both expletives – *it* and *there* – and *PVS* were significant for Group 1 [*It-PVS*: $F(1,31) = 7.37, p = .022^{*}$; *There-PVS*: $F(1,31) = 19.41, p < .001^{**}$]. This indicates that the participants erroneously accepted significantly more mistakes of post-verbal subjects than null expletive subjects – both in weather and existential constructions. Moreover, in Group 1, the *NTS-PVS* contrast was significant [$F(1,31) = 5.82, p = .022^{*}$]. That is, the participants mistakenly accepted post-

verbal subjects significantly more than they accepted ungrammatical null thematic subjects. The remaining contrasts were insignificant for Group 1.

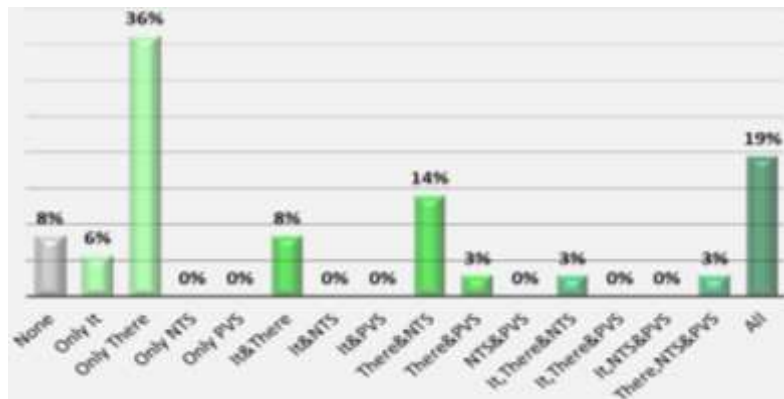
In Group 2, a slightly different picture emerged. Here the differences between both expletives – *it* and *there* – and *NTS* were significant [*It-NTS*: $F(1,34) = 7.08, p = .012^*$; *There-NTS*: $F(1,34) = 13.18, p = .001^{**}$]. This means that the participants erroneously accepted significantly more mistakes of null thematic subjects than of null expletive subjects – both in weather and existential constructions. Moreover, the difference between *There* and *PVS*-sentences was significant as well [$F(1,34) = 4.56, p = .04^*$]. The participants incorrectly accepted significantly more sentences incorporating an ungrammatical post-verbal subject than ungrammatical sentences lacking the expletive *there*. The remaining contrasts were insignificant for Group 2.

As for correlations, no strong correlations were detected between any of the sentence types. Moreover, inspecting the sentence types that were mastered perfectly (where six out of six sentences were answered correctly), Group 2 showed less possible combinations both than those emerging in Group 1 and than those that had emerged in the pretest, as seen visually in figures (5) and (6):

(5) *Posttest Results: Percentages of Participants Who Performed Perfectly on the Different Sentence Types from Group 1*



(6) *Posttest Results: Percentages of Participants Who Performed Perfectly on the Different Sentence Types from Group 2*



5.2.2.3. *Interactions by Groups*

The interactions between Sentence Type and the between-subjects factors of Learning Disabilities and List were insignificant for both groups. In contrast, the interaction between Sentence Type and School was significant only for Group 2 [$F(3,99) = 4.23, p = .007^{**}$]. This interaction was highly significant for a single contrast: *There-PVS*. This means that in Group 2, School 1 demonstrated a significantly larger difference between *There*-sentences and *PVS*-sentences (both in terms of mean accuracies and in terms of standard deviations), in comparison with School 2 (see graph 7 in section 5.2.3.2 below).

5.2.3. By-Subjects Analysis by Groups and by Schools

5.2.3.1. *Between-Subjects Analysis by Groups and by Schools*

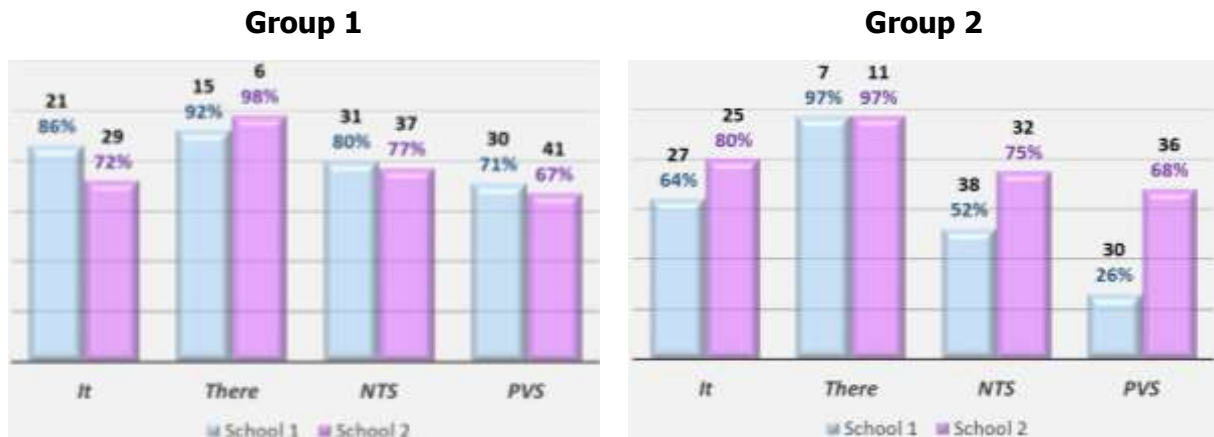
The results from two 4X2 ANCOVAs (covariate: English Grade) with Sentence Type as a within-subjects factor and different between-subjects factors: Learning Disabilities and List, were split according to groups and schools. Neither the Learning Disabilities factor nor the List factor revealed a main effect in any of the groups and in any of the schools.

5.2.3.2. *Within-Subjects Analysis by Groups and by Schools*

The results from a repeated measures ANCOVA (covariate: English Grade) with only Sentence Type as a within-subjects factor were split according to both groups and schools. A main effect for Sentence Type was revealed only in Group 1, School 2 [$F(3,42) = 4.13, p = .012^*$]. The different accuracy levels and standard deviations achieved in each sentence type are presented in figure (7) below. Note that the

discrepancies between the two schools were especially prominent in Group 2, where the School factor had a main effect (see section 5.2.2.1 above).

(7) *Posttest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Groups and Schools)*



Only the contrast between *There* and *PVS* turned out to be significant in Group 1, School 2 [$F(1,14) = 14.99, p = .002^{**}$].

No strong correlations were detected between any of the sentence types, but intermediate correlations did emerge:

- Group 1, School 2 showed an intermediate positive correlation between *It* and *PVS* [$r(106) = .516, p = .041^*$]. Participants who demonstrated high accuracy in *It*-sentences also manifested high accuracy in *PVS*-sentences.
- Group 2, School 1 showed an intermediate negative correlation between *It* and *There* [$r(15) = -.583, p = .023^*$]. Participants who demonstrated high accuracy in *There*-sentences manifested low accuracy in *It*-sentences.
- Group 2, School 2 showed an intermediate positive correlation between *It* and *PVS* [$r(21) = .543, p = .011^*$]. Participants who demonstrated high accuracy in *It*-sentences also manifested high accuracy in *PVS*-sentences.

5.3. Pretest versus Posttest

5.3.1. By-Subjects Analysis by Groups ⁴²

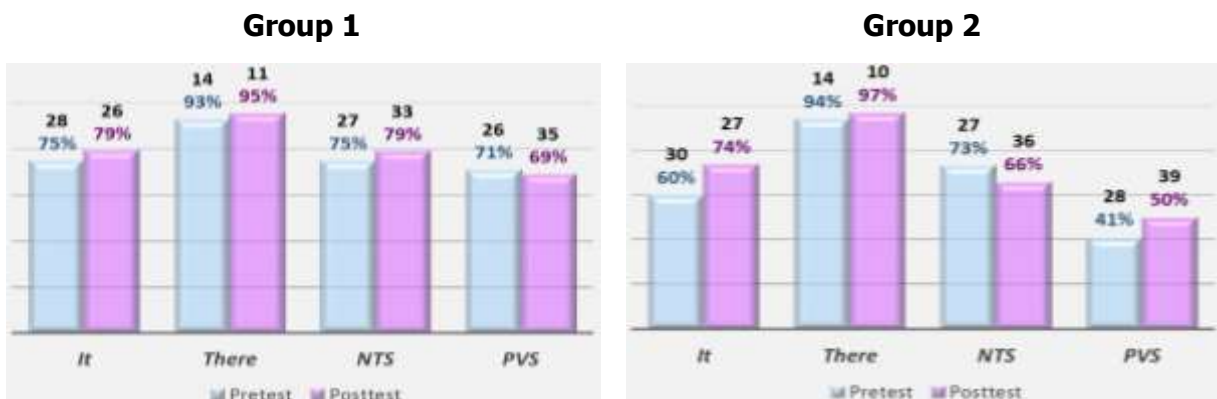
5.3.1.1. Between-Subjects Analysis by Groups

The results from two 4X2X2 ANCOVAs (covariate: English Grade) with Sentence Type (*It*, *There*, *NTS*, *PVS*) and Time (*pretest*, *posttest*) as within-subjects factors, and different between-subjects factors: Learning Disabilities and School, were split according to groups. The Learning Disabilities factor did not yield a significant effect for both groups. However, the analysis revealed a main effect for School only in Group 2, which was taught explicitly [$F(1,33) = 9.15, p = .005^{**}$]. This finding means that in Group 2, School 2 significantly improved its performance from the pretest to the posttest, whereas School 1 did not (cf. graphs 9-10 in section 5.3.2.2).

5.3.1.2. Within-Subjects Analysis by Groups

The results from a 4X2 ANCOVA (covariate: English Grade), involving the within-subjects factors of Sentence Type and Time, were split according to groups. Time revealed no significant effect in either of the groups, while a main effect was revealed for Sentence Type in both groups [Group 1: $F(3,93) = 4.85, p = .004^{**}$; Group 2: $F(3,102) = 4.82, p = .004^{**}$]. The different accuracy levels and standard deviations achieved in each sentence type in the pretest and in the posttest are presented in figure (8):

(8) Pretest vs. Posttest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Groups)



⁴² See Appendix III, section III for the between-subjects analysis without splitting the results according to groups (and schools). Also see the interactions in both the between-subjects and the within-subjects analyses, with division according to groups.

Not all sentence types were significantly different from each other, and significance was not necessarily seen in the same pairs for both groups. For Group 1, three contrasts turned out significant: *It-PVS*, *There-NTS* and *There-PVS* [$F(1,31) = 4.73, p = .037^*$; $F(1,31) = 5.94, p = .021^*$; $F(1,31) = 16.55, p < .001^{**}$]. Group 2 revealed two significant contrasts: *It-NTS* and *There-NTS* [$F(1,34) = 11.19, p = .002^{**}$ and $F(1,34) = 11.19, p = .002^{**}$, respectively].

A paired-samples t-test for Group 1 indicated that posttest scores were insignificantly higher from the pretest for *It*, *There* and *NTS*, and insignificantly lower for *PVS*. As for Group 2, a paired-samples t-test indicated that posttest scores were higher from the pretest scores for the *It* type in a highly significant manner [$t(35) = 2.81, p = .008^{**}$]. However, the posttest results were insignificantly higher from the pretest for the sentence types of *There* and *PVS* and insignificantly lower for *NTS*.

5.3.2. By-Subjects Analysis by Groups and by Schools

*5.3.2.1. Between-Subjects Analysis by Groups and by Schools*⁴³

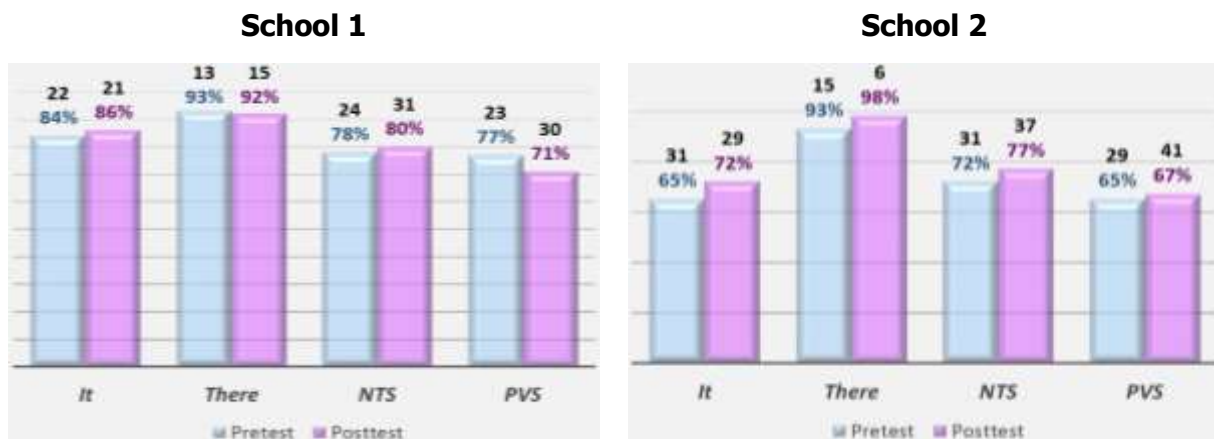
The results from a 4X2X2 ANCOVA (covariate: English Grade) with Sentence Type and Time as within-subjects factors and Learning Disabilities as a between-subjects factor were split according to groups and schools. In both groups, in both schools, no significant effect was noted for Learning Disabilities.

5.3.2.2. Within-Subjects Analysis by Groups and by Schools

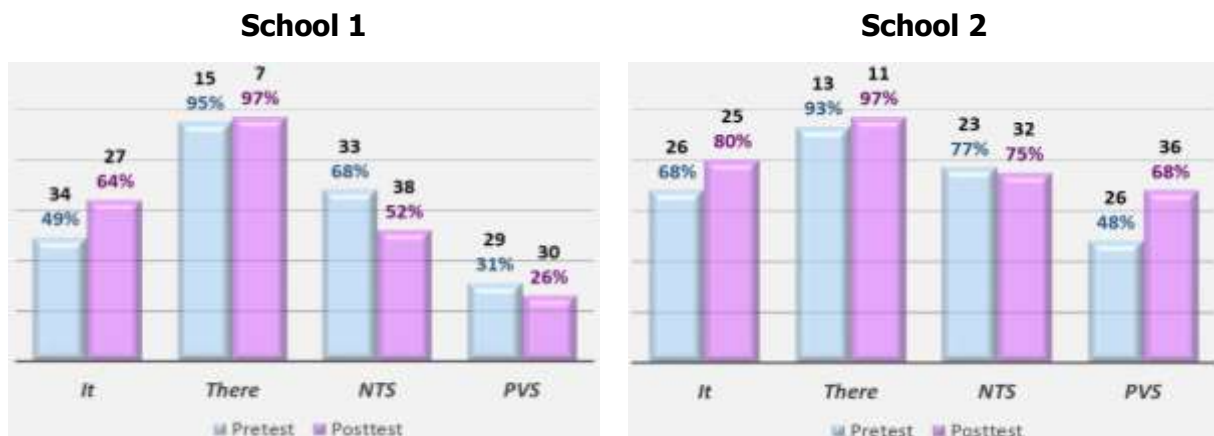
The results from a 4X2 ANCOVA (covariate: English Grade) with Sentence Type and Time as within-subjects factors were split according to both groups and schools. Time revealed no main effect in either of the groups, in both schools. Conversely, Sentence Type revealed a main effect only for Group 1, School 2 and for Group 2, School 1 [$F(3,42) = 3.6, p = .021^*$ and $F(3,39) = 2.96, p = .044^*$, respectively]. The accuracy levels and standard deviations achieved in each sentence type in the pretest and in the posttest are presented in figures (9) and (10) below.

⁴³ See Appendix III, section III for the interactions between the factors involved in the analysis according to groups and schools.

(9) Pretest vs. Posttest Results for Group 1: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Schools)



(10) Pretest vs. Posttest Results for Group 2: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Schools)



For Group 1, School 2, three contrasts were significant: *It-There*, *There-NTS* and *There-PVS* [$F(1,14) = 5.37, p = .036^*$, $F(1,14) = 8.18, p = .013^*$ and $F(1,14) = 9.53, p = .008^{**}$, respectively]. For Group 2, School 1, two of the contrasts were significant: *It-NTS* and *There-NTS* [$F(1,13) = 6.73, p = .022^*$ and $F(1,13) = 5.29, p = .039^*$, respectively].

A paired-samples t-test for Group 1 revealed that the posttest scores of School 1 were insignificantly higher from the pretest for *It* and *NTS*, and insignificantly lower for *There* and *PVS*. School 2 showed an insignificant improvement for all sentence types.

As for Group 2, a paired-samples t-test for School 1 indicated that posttest scores were insignificantly higher from the pretest scores for *It* and *There*, and insignificantly lower for *NTS* and *PVS*. School 2, on the other hand, revealed a

significant improvement in two sentence types: *It* and *PVS* [$t(20) = 2.37, p = .028^*$ and $t(20) = 2.36, p = .029^*$, respectively]. An insignificant improvement was noted for *There*, and an insignificant deterioration was observed for *NTS*.

5.4. Post-posttest

5.4.1. By-Subjects Analysis ⁴⁴

5.4.1.1. Between-Subjects Analysis

A 4X2 ANCOVA (covariate: English Grade) with Sentence Type as a within-subjects factor and Group as a between-subjects factor revealed no main effect for Group, similarly to the posttest (see section 5.2.1.1). The removal of the inter-group differences following the teaching sessions appears to have persisted.

5.4.1.2. Interactions

On a par with the posttest, the interaction between Sentence Type and Group was insignificant for all of the within-subjects contrasts (cf. section 5.2.1.2).

5.4.2. By-Subjects Analysis by Groups

5.4.2.1. Between-Subjects Analysis by Groups

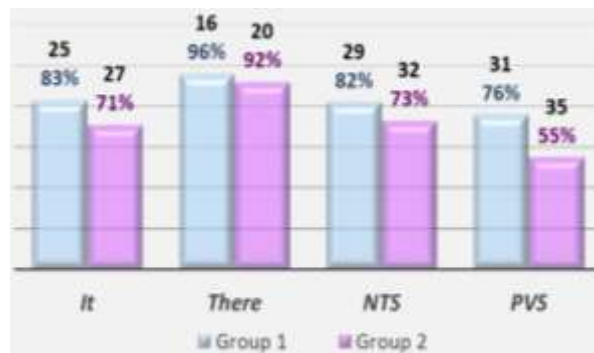
The results from three 4X2 ANCOVAs (covariate: English Grade) with Sentence Type as a within-subjects factor and different between-subjects factors: Learning Disabilities, List and School, were split according to groups. Similarly to the posttest, no main effect was revealed for List and for Learning Disabilities, in both groups. However, in contrast with both the pretest and the posttest results, the School factor did not yield a main effect in either of the groups (cf. sections 5.1.2.1 and 5.2.2.1). It seems that the insignificant improvement of School 1, Group 2 from the posttest, together with the insignificant deterioration of School 2, Group 2, have eliminated the significant difference between the schools in Group 2 (cf. graphs 19 and 20 in section 5.5.3.2 below).

⁴⁴ See Appendix III, section IV for the summary of the by-items analysis.

5.4.2.2. Within-Subjects Analysis by Groups

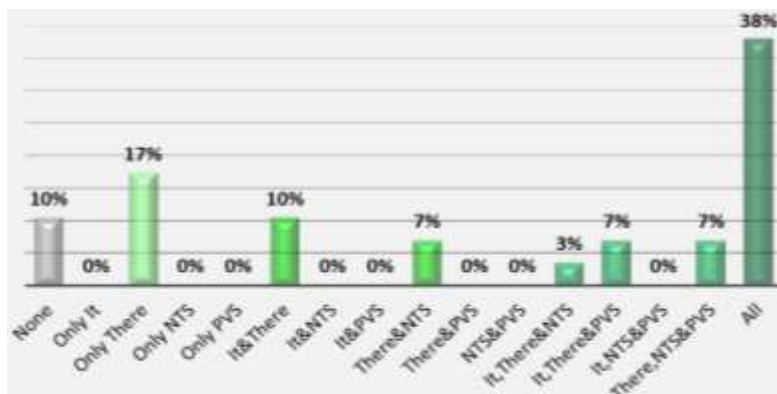
The results from a repeated measures ANCOVA (covariate: English Grade) with only Sentence Type as a within-subjects factor (no between-subjects factors) were split according to groups, and both revealed no main effect for Sentence Type. The different accuracy levels and standard deviations achieved in each sentence type are presented in figure (11):

(11) Post-posttest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Groups)

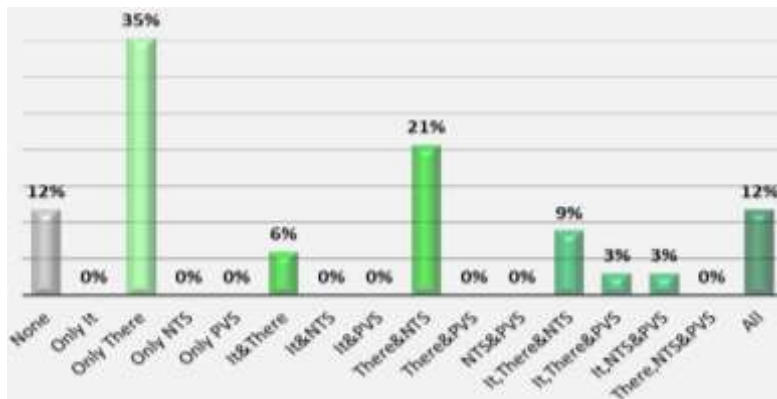


No strong correlations were detected between any of the sentence types, but an intermediate correlation did occur in Group 1 between NTS and PVS [$r(29) = .564, p = .001^{**}$]. Moreover, inspecting the sentence types that were mastered perfectly, Group 1 showed less possible combinations than in the posttest. Group 2 showed similar combinations to the ones seen in the posttest, but different combinations than those emerging in Group 1, as seen in figures (12) and (13):

(12) Post-posttest Results: Percentages of Participants Who Performed Perfectly on the Different Sentence Types from Group 1



(13) Post-posttest Results: Percentages of Participants Who Performed Perfectly on the Different Sentence Types from Group 2



5.4.2.3. Interactions by Groups

The interactions between Sentence Type and the between-subjects factors of Learning Disabilities, List and School were insignificant for both groups. Note that the significant interaction between Sentence Type and School, seen in the posttest for Group 2 has disappeared (cf. section 5.2.2.3).

5.4.3. By-Subjects Analysis by Groups and by Schools

5.4.3.1. Between-Subjects Analysis by Groups and by Schools⁴⁵

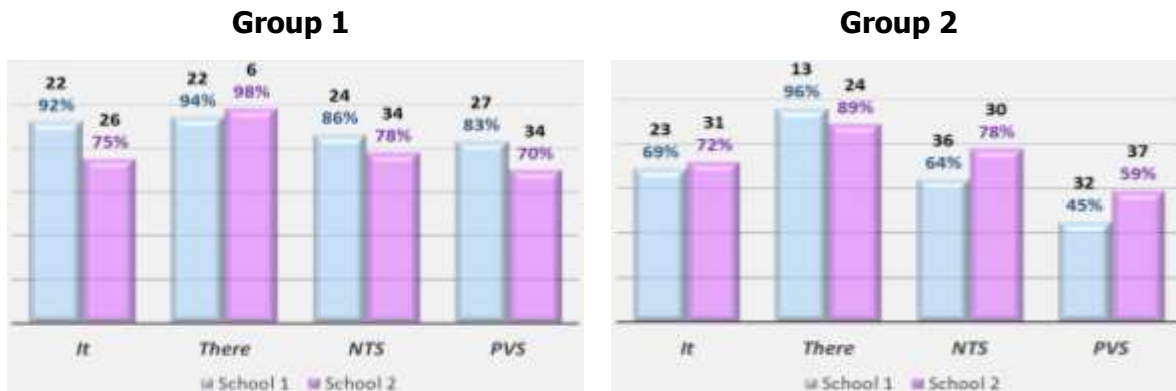
The results from two 4X2 ANCOVAs (covariate: English Grade) with Sentence Type as a within-subjects factor and different between-subjects factors: Learning Disabilities and List, were split according to groups and schools. Neither the Learning Disabilities factor nor the List factor revealed a main effect in any of the groups and in any of the schools.

5.4.3.2. Within-Subjects Analysis by Groups and by Schools

The results from a repeated measures ANCOVA (covariate: English Grade) with only Sentence Type as a within-subjects factor were split according to both groups and schools. No main effect was revealed for Sentence Type, in any of the groups and in any of the schools. The different accuracy levels and standard deviations achieved in each sentence type are presented in figure (14) below.

⁴⁵ Cf. Appendix III, section IV for the interactions in the analysis split by groups and schools.

(14) Post-posttest Results: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types (by Groups and Schools)



A strong positive correlation was revealed between *NTS* and *PVS*, only for Group 1, School 2 [$r(15) = .743, p = .001^{**}$]. That is, participants with high accuracy in the *NTS*-sentences also manifested high accuracy in *PVS*-sentences. Other intermediate correlations emerged:

- Group 1, School 1 showed an intermediate positive correlation between *There* and *PVS* [$r(14) = .534, p = .049^*$]. Participants who demonstrated high accuracy in *There* also manifested high accuracy in *PVS*.
- In parallel with the posttest, Group 1, School 2 showed an intermediate positive correlation between *It* and *PVS* [$r(15) = .554, p = .032^*$]. Participants who demonstrated high accuracy in *It* also manifested high accuracy in *PVS*.
- Group 2, School 2 showed an intermediate positive correlation between *It* and *NTS* [$r(20) = .507, p = .023^*$]. Participants who demonstrated high accuracy level in *It*-sentences also manifested high accuracy in *NTS*.

5.5. Pretest versus Posttest versus Post-Posttest

5.5.1. By-Subjects Analysis

5.5.1.1. Between-Subjects Analysis⁴⁶

A 4X3X2 ANCOVA (covariate: English Grade) with Sentence Type (*It*, *There*, *NTS*, *PVS*) and Time (*pretest*, *posttest*, *post-posttest*) as within-subjects factors and Group (Group 1, Group 2) as a between-subjects factor revealed no main effect for Group.

⁴⁶ See Appendix III, section V for the interactions of the by-subjects analysis.

5.5.2. By-Subjects Analysis by Groups

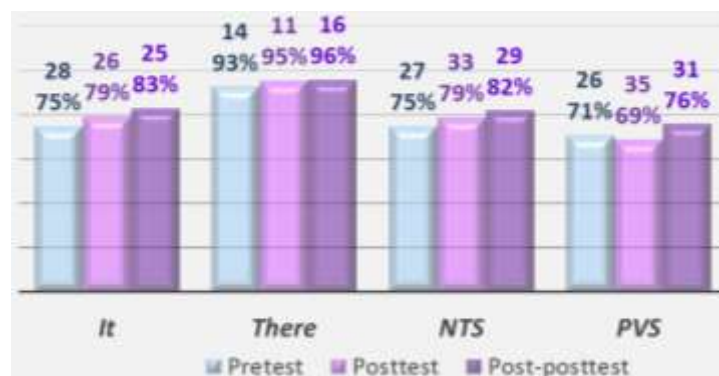
5.5.2.1. Between-Subjects Analysis by Groups⁴⁷

The results from two 4X3X2 ANCOVAs (covariate: English Grade) with Sentence Type and Time as within-subjects factors and different between-subjects factors: Learning Disabilities and School, were split according to groups. The Learning Disabilities factor did not yield a significant effect for both groups. The School factor, on the other hand, yielded a significant effect for Group 2 [$F(1,33) = 5.18, p = .03^{**}$]. That is, the Group 2 participants from School 2 improved significantly between the tests than their School 1 peers.

5.5.2.2. Within-Subjects Analysis by Groups

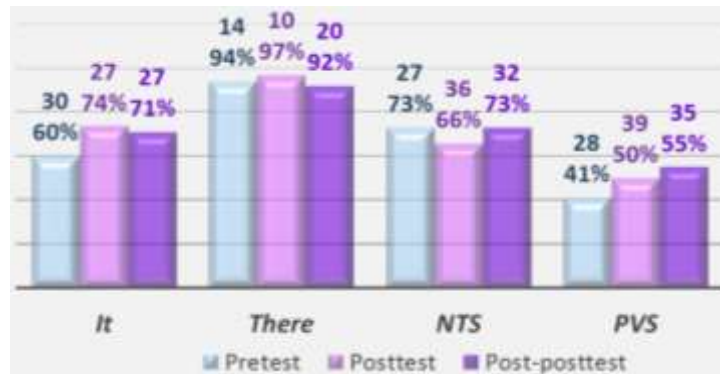
The results from a 4X3 ANCOVA (covariate: English Grade) involving the within-subjects factors of Sentence Type and Time (no between-subjects factors) were split according to groups. Time revealed no significant effect in either of the groups, while a main effect was revealed for Sentence Type in both groups [Group 1: $F(3,81) = 3.07, p = .032^*$ and Group 2: $F(3,96) = 3.64, p = .015^*$]. The different accuracy levels and standard deviations achieved in each sentence type in the different tests are presented in figures (15) and (16):

(15) Pretest vs. Posttest vs. Post-posttest Results for Group 1: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types



⁴⁷ See Appendix III, section V for the interactions of the by-subjects analysis according to groups.

(16) Pretest vs. Posttest vs. Post-posttest Results for Group 2: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types



Not all sentence types were significantly different from each other, and significance was not observed in the same pairs for both groups. For Group 1, two contrasts turned out significant: *It-There* and *There-PVS*: [$F(1,27) = 5.73, p = .024^*$ and $F(1,27) = 10.05, p = .004^{**}$, respectively]. Group 2 also revealed two (different) significant contrasts: *It-NTS* and *There-NTS* [$F(1,32) = 11.03, p = .002^{**}$ and $F(1,32) = 5.66, p = .023^*$, respectively].

A paired-samples t-test comparing the post-posttest results with the posttest results indicated that, for Group 1, post-posttest scores were insignificantly higher from the posttest scores for all sentence types. As for Group 2, a paired-samples t-test indicated that post-posttest scores were insignificantly higher from the posttest for *NTS* and *PVS*, and insignificantly lower from the posttest scores for *It* and *There*.

A parallel test comparing the post-posttest with the pretest indicated that, for Group 1, post-posttest scores were insignificantly higher from the pretest for all sentence types. As for Group 2, post-posttest scores were insignificantly higher from the pretest for *It* and significantly higher for *PVS* [$t(33) = 2.45, p = .02^*$]. The post-posttest results were insignificantly lower from the posttest for *There* and *NTS*.

5.5.3. By-Subjects Analysis by Groups and by Schools

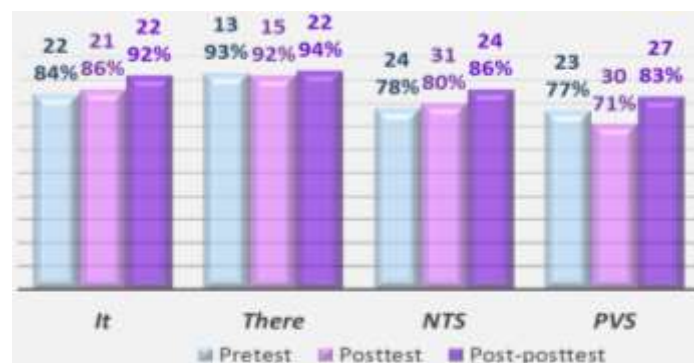
5.5.3.1. Between-Subjects Analysis by Groups and by Schools⁴⁸

The results from a 4X3X2 ANCOVA (covariate: English Grade) with Sentence Type and Time as within-subjects factors and Learning Disabilities as a between-subjects factor were split according to groups and schools. In both groups, in both schools, no significant effect was noted for Learning Disabilities.

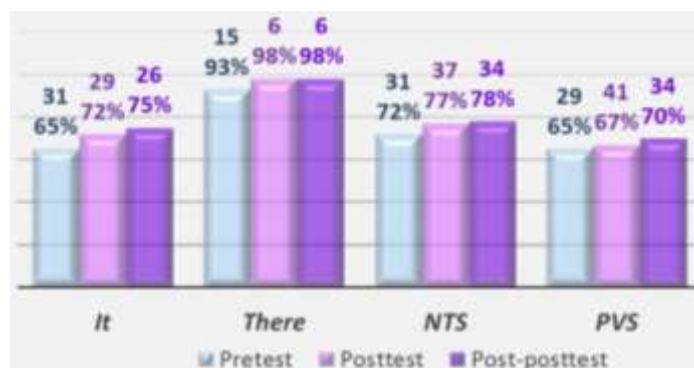
5.5.3.2. Within-Subjects Analysis by Groups and by Schools

The results from a 4X2 ANCOVA (covariate: English Grade) with Sentence Type and Time as within-subjects factors were split according to both groups and schools. Neither Time nor Sentence Type revealed main effects in either of the groups, in both schools. The different accuracy levels and standard deviations achieved in each sentence type in the pretest and in the posttest are presented in figures (17)-(20):

(17) Pretest vs. Posttest vs. Post-posttest Results for Group 1, School 1: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types

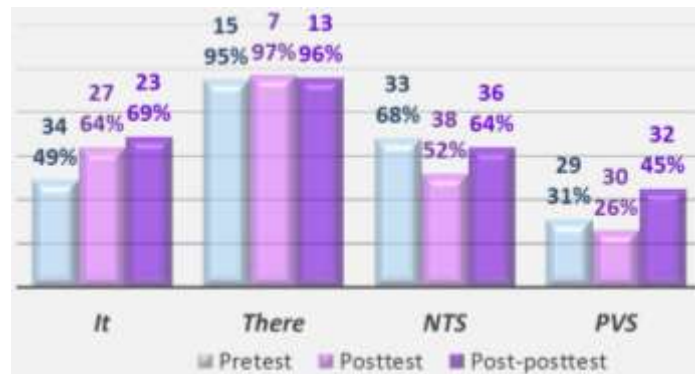


(18) Pretest vs. Posttest vs. Post-posttest Results for Group 1, School 2: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types

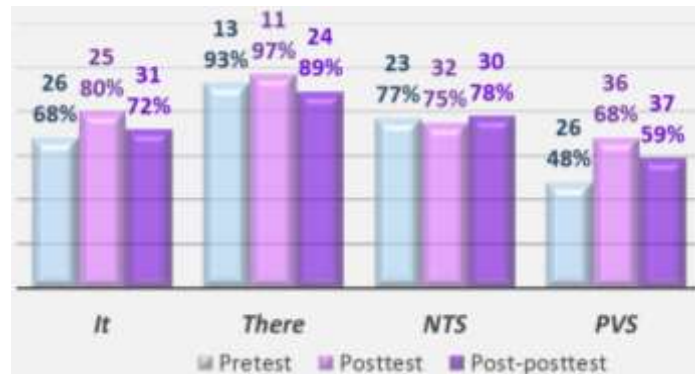


⁴⁸ See Appendix III, section V for the interactions of the by-subjects analysis according to groups and schools.

(19) Pretest vs. Posttest vs. Post-posttest Results for Group 2, School 1: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types



(20) Pretest vs. Posttest vs. Post-posttest Results for Group 2, School 2: Mean Accuracies (%) and Standard Deviations of the Different Sentence Types



In Group 1, each of the schools yielded only one significant contrast: *It-PVS* in School 1 and *There-PVS* in School 2 [$F(1,12) = 5.24, p = .041^*$ and $F(1,13) = 8.59, p = .012^*$, respectively]. In Group 2, only School 1 revealed a significant contrast between *It* and *NTS* [$F(1,12) = 5.54, p = .036^*$].

A paired-samples t-test comparing the post-posttest results with the posttest results indicated that for Group 1, School 1 post-posttest scores were insignificantly higher from the posttest results in all sentence types. School 2 showed an insignificant deterioration in *NTS*, and an insignificant improvement in the remaining sentence types.

As for Group 2, a paired-samples t-test indicated that for School 1 post-posttest scores were significantly higher from the posttest scores only for *PVS* [$t(13) = 2.46, p = .029^*$]. The remaining sentence types revealed an insignificant improvement from the posttest to the post-posttest. School 2, on the other hand, revealed an insignificant improvement only in the *NTS* sentence type. For the rest of the sentence types, an insignificant deterioration was noted.

A parallel test comparing the post-posttest results with the pretest results indicated that for Group 1, both School 1 and School 2 achieved post-posttest scores that were insignificantly higher from the pretest scores for all sentence types. As for Group 2, School 1 demonstrated an insignificant deterioration in the post-posttest scores of *NTS* (compared to the pretest), alongside insignificant improvement for the remaining sentence types. School 2 demonstrated an insignificant deterioration in the post-posttest scores of the *There* sentence type (compared to the pretest), alongside insignificant improvement for the remaining sentence types.

6. DISCUSSION

6.1. Pretest

The pretest's purpose was threefold. First, it aimed to establish the participants' initial level of proficiency, in order to have a baseline to compare to after the lessons. Second, the pretest examined whether there is L1 transfer into the interlanguage grammar. It further enabled me to get a preliminary picture concerning the resettability of the Null Subject Parameter and the parameter structure in L2 acquisition (i.e., the feature cluster associated with the parameter value).

Concerning L1 transfer, the results showed that the participants wrongly accepted the ungrammatical omission of both expletive and thematic subjects, as well as post-verbal subjects in English (see graph 1 in section 5.1.1.2). All of those constructions are grammatical in their L1 (Hebrew), but not in the target L2 (English). In the same breath, it is important to note that the L2-ers accepted these ungrammatical sentences to a lesser extent than they would accept them in their native language (i.e., Hebrew). That is, more ungrammatical sentences were correctly rejected than wrongly accepted, and the participants' accuracy levels were closer to 100% than to 0% in all of the properties associated with the parameter.

The omission (or the acceptance of omission) of subjects in itself – whether expletive or referential – does not necessarily indicate transfer from the L1, since omission can be taken to be the unmarked option (e.g., Hyams 1986). In that case, it would also emerge in the opposite scenario to the one seen in the current study, i.e., in the case of English-speakers learning Hebrew as an L2. To my knowledge, the Null Subject Parameter has not been checked among participants who fulfill these specific criteria (i.e., L1: English, L2: Hebrew). Nevertheless, based on unsystematic observations of such L2-ers, I get the impression that they do produce "unnecessary" pronominal subjects in Hebrew and refrain from omission, at least at the dawn of the acquisition process. That is, it is not the case that the unmarked option emerges, but rather that L1 transfer surfaces.

This intuition is strengthened by Hacoen and Schaeffer's (2007) longitudinal study of a Hebrew/English bilingual child (2;10-3;4). The authors check whether, due to the influence of English, the child produces "redundant" (i.e., pragmatically inappropriate) overt subjects in Hebrew. They indeed find out that she produces

overt subjects with low informativeness (that is, subjects which neither introduce new information nor provide emphasis/contrast) three times more than the Hebrew monolingual controls. They also observe that the bilingual child's use of inappropriate subjects decreases over time. If subject omission is indeed the unmarked option, and since children in particular would rather omit constituents than pronounce them due to processing limitations (e.g., Bloom 1990), a possible way to account for the child's performance is through cross-linguistic influence. In terms of L2 acquisition, such an influence would be termed as 'L1 transfer.'

Although the child in Hacoen and Schaeffer's (2007) study produces "redundant" subjects in Hebrew, she still produces more null than overt subjects. Similar findings are seen in studies investigating mainly adult learners but also some child learners of different null-subject L2s (e.g., Spanish, Arabic), who are native speakers of non-null-subject L1s (e.g., English, French). Such studies show that the L2-ers produce or accept a substantial amount of null subjects in their L2, in spite of the obligatoriness of phonetically realized subjects in their mother tongue. However, L2-ers still produce or accept overt subjects which would be rejected by native speakers of the null-subject language (e.g., Phinney 1987, Licerias 1989, Alhawary 1997, Licerias and Díaz 1999, Montrul and Rodríguez Louro 2006). Out of these studies, those that investigate the other properties that the current study associates with the parameter (i.e., post-verbal subjects and *that*-trace effect) show that these properties are indeed transferred into the interlanguage grammar (Licerias 1989, Montrul and Rodríguez Louro 2006). That is, these studies support transfer from L1.

The results seen in the pretest of the current study in terms of null subjects cohere with acquisition studies involving English as an L2 and a null-subject L1 (e.g., Greek in Tsimpli and Roussou 1991, Spanish in Valero-Garcés 1997 and in Guillén 2004, Turkish in Haznedar 1997, Spanish/Basque in García Mayo 1998). The current study reveals an erroneous acceptance of expletive null subjects in 24% of the weather contexts as well as 19% mistakenly accepted null referential subjects. On a par with previous research, the learners accept more overt than null subjects in the L2 English, but still accept some null subjects which are ungrammatical in English, demonstrating variability in their interlanguage grammars. In studies in which the expletive subjects are analyzed separately from the referential ones (termed here *NVS*), the learners are less accurate with expletive subjects than they are with

referential subjects (Tsimpli and Roussou 1991, Guillén 2004). Recall that in the present study, *It*-sentences involved significantly more mistakes than *NTS*-sentences (both in the contrasts for all of the participants and in the group contrasts for the participants who proceeded to the posttest, see sections 5.1.1.2 and 5.1.2.2 above).

Concerning post-verbal subjects, the results of the present study diverge from previous studies. 32% of the sentences involving post-verbal subjects were judged to be grammatical in the L2 English. While L2 English post-verbal subjects constitute the largest amount of mistakes wrongly accepted by Hebrew speakers, Valero-Garcés (1997), García Mayo (1998) and Tsimpli and Roussou (1991) report a negligible amount of post-verbal subjects in L2 English (if at all). This difference may be attributed to age and proficiency factors. While the present study deals with children whose proficiency in English is low, the other studies probe adults with higher proficiency levels.

In light of previous aforementioned studies, the findings of the present study indicate full transfer from the L1, giving rise to null and post-verbal subjects in the non-null-subject L2. Otherwise, the acceptance of these ungrammatical sentences in English cannot be accounted for. At the same time, it is also clear that the pupils are sensitive to the differences between English and Hebrew, as they do not accept null and post-verbal subjects as freely as they do in Hebrew. This means that the children notice the difference between the languages in terms of the Null Subject Parameter, but simply do not apply this knowledge systematically at this point in their learning process. These findings cohere with Sauter's (2002) conclusions concerning adult L2 learners, as well as with all of the studies noted above.

The second issue to be discussed concerns the resettability of the Null Subject Parameter. The pretest results showed that 22% of the 106 participants perfectly mastered all of the parameter properties that were examined (cf. figure 2 in section 5.1.1.2). That is, they performed accurately on six out of six target sentences in each of the four sentence types. These findings have two possible explanations. The participants might have acquired all of the properties together, demonstrating that parameters can be reset and that the grammar is capable of change. But it is also possible that each property was acquired separately, regardless of its "fellow" properties. The latter might have been achieved via general cognitive abilities that have been at work during the learning process, without a significant change in the

learner's grammar. Since the majority of the pretest participants did not demonstrate identical accuracy levels in the different sentence types, it does not seem to be the case that all of the properties were acquired at once.

This leads to the third issue that needs to be addressed. Assuming that expletives serve as the trigger for resetting the parameter (following Hyams 1986), are other features acquired (thematic subject omission; post-verbal subjects) once the learner starts using expletives systematically? That is, is there a cluster of features in L2 acquisition? Based on the findings discovered in the pretest, the answer seems to be negative. The 78% of the participants who did not master all properties greatly varied in their proficiency in the different sentence types. The many possible combinations of different accuracy levels in the various properties do not cohere with the parameter structure suggested in the literature in terms of a feature cluster (e.g., Rizzi 1982). The (lack of) correlations further reinforce the absence of such a cluster (cf. section 5.1.1.2). Most conspicuous was the lack of correlation between proficiency in either of the expletive elements and between mastering the obligatoriness of thematic subjects (the *NTS* sentence type). It appears that while the properties of mandatory expletive elements and of mandatory phonetically realized thematic subjects are supposedly two sides of the same coin, mastering one does not necessarily entail mastering the other, and vice versa.

The lack of clustering can be interpreted in several ways. It might indicate parameter breakdown (either local or global), which means that there is no full access to UG in L2 acquisition. However, it can also be attributed to the input the children were exposed to until the pretest. It is possible that the positive evidence the children have absorbed was not "rich" enough to instigate the resetting of the parameter, or that the input they received consisted mainly of negative evidence. If the English input was indeed deficient, the pupils might have learnt the different properties (at least some of them) individually, since negative evidence would not affect their unconscious linguistic competence in the L2, and thus could not trigger parameter resetting. The properties they are proficient in are thus not grammar-based, but rather form part of a separate system of learned linguistic knowledge (Schwartz and Gubala-Ryzak 1992, Schwarz 1993). If this were the case, we would expect clustering of features following exposure to the suitable input.

One last point I would like to discuss is the discrepancy between the expletives *It* and *There* (76% vs. 95% accuracy). The difference between them was not significant, but I think it deserves some attention nevertheless, since the existential *There* is clearly a structure the children have gained full control over, while the weather *It* is not. I believe the difference between these two constructions derives from the different emphasis put on each of them in class. While pupils are explicitly taught the existential constructions in school, weather constructions do not receive much attention (if at all).⁴⁹ The problem in terms of the Null Subject Parameter is that "there is/are" is taught as a single unit signifying the existence of something/someone (parallel to the Hebrew *yeš*). The pupils most probably do not interpret this unit as a subject (*there*) and a verb (*be*), but rather, as a single unit of meaning, since this is how this construction is explained to them by the teacher. Hence, they do not interpret *there* as a subject. This was also evident in the lessons following the pretest (cf. section 4.4). This instruction was "destructive" in terms of the parameter, and might serve as an alternative explanation for the utter lack of clustering seen in the pretest. Again, if this were indeed the case, we would expect the features to cluster after exposure to the proper input.⁵⁰

6.2. Posttest

Having established that L1 transfer takes place, the posttest was meant to explore whether the parameter is resettable following adequate input (abundance of expletive elements), and whether explicit exposure to expletives proves more effective than mere exposure to them (i.e., the advantage – if any – of explicit positive evidence over natural positive evidence).

The posttest results showed that 21% of the Group 1 participants (exposed only to natural positive evidence) who took part in both tests perfectly mastered all of the parameter properties examined in the study after the teaching sessions, and so did 19% of the Group 2 participants (see graphs 5 and 6 under section 5.2.2.2).

⁴⁹ This observation is based on information provided to me by English teachers.

⁵⁰ It is important to note that the existential construction is taught over a few years, whereas I only had two 45-minute lessons to deliver the information regarding expletives. Hence, it may very well be the case that it is not merely proper input that would instigate the desired change, but rather, exposure to the proper input during a significant period of time.

Those participants performed accurately on 6 out of 6 target sentences in each of the four sentence types. These findings thus show that parameter settings transferred from the L1 can change into the L2 values, but do they indicate clustering of features?

If we look more closely at the Group 1 participants that mastered all of the sentence types in the posttest, only a very small fraction of the participants (3%) had mastered two of the parameter properties prior to the teaching sessions and improved in the remaining two properties. That is, only a few participants improved in more than one feature simultaneously. The majority of these top-performance participants had already mastered three out of the four sentence types in the pretest (18% of Group 1). That is, we mainly have indication for the acquisition of a single property from the pretest to the posttest. The newly-acquired property varied between the participants (3: *PVS*, 2: *It*, 1: *There*). It is important to note that the majority of the Group 1 top-performance participants improved from 83.33% accuracy on the pretest to 100% accuracy on the posttest. That is, they performed accurately on one more question.

If we inspect those who achieved perfect performance in Group 2, we get a slightly different picture: 11% had already mastered three out of the four sentence types in the pretest (i.e., improved in a single property – either *It* or *PVS*), 3% had mastered two of the properties (i.e., improved in two properties: *It* and *PVS*) and 5% had mastered none of the properties prior to the posttest (i.e., improved in all four properties). Here we have evidence of two or more properties that were acquired simultaneously. In contrast to Group 1, here most of the top-performance participants improved from 50%-66.67% accuracy on the pretest to 100% accuracy on the posttest. That is, they performed accurately on two or three more questions correctly and even showed a transition from a guessing pattern (50%) to a top performance.

Moreover, inspecting the entire sample of every group (not only the participants who reached perfect performance), different improvement patterns can be observed:

- 52% of the participants in Group 1 improved in a single (varying) feature, as opposed to 36% in Group 2 (where the feature was mostly *It*).

- While 18% of Group 1 improved in two (varying) features, 28% of Group 2 manifested better performance on two features (mostly *It* and *PVS*).
- 9% of Group 1 and 6% of Group 2 improved in three (varying) features.
- Only 6% of the participants from Group 2 improved in all features

We can see that improvement for more than one feature is possible in both groups (27% in Group 1 and 40% in Group 2), but is more frequent in Group 2, that was explicitly exposed to expletive elements. This is strengthened by the correlations that were seen for *It* and *PVS*, both in Group 1 and in Group 2 (only for School 2, see section 5.2.3.2). Recall that no correlations were seen for these two properties (or for any other property pair) in the pretest (cf. section 5.1.1.2). That is, the parameter's properties indeed seem to cluster together following exposure to input that is abundant with expletive elements.

The findings that the majority of the pupils did not reach perfect performance on all of the features (79% in Group 1 and 81% in Group 2) can be attributed to the amount of input both groups were exposed to during the teaching sessions. Perhaps three texts and two lessons were simply not enough to instigate the desired change in the majority of the participants. It is also arguable whether the input can indeed be considered as positive evidence, in the sense that it was read from texts in an instructional framework, which is different from listening to naturalistic input such as conversations.

The issue of explicit positive evidence leads to the last issue to be discussed concerning the posttest: Can explicit positive evidence (of expletive elements) improve L2 learning by instigating the resetting of the Null Subject Parameter, or is only natural positive evidence required? We saw that the significant difference between the groups that was seen in the pretest disappeared following the teaching sessions (see section 5.2.1.1). Group 1 still demonstrated better performance than Group 2, but the difference in performance was no longer significant. It is reasonable to conclude that this result is indeed due to the explicit positive evidence that the second group received. This was also seen in the interaction between Sentence Type and Group that was significant in the pretest but not in the posttest (cf. sections 5.1.1.3 and 5.2.1.2).

Moreover, the only significant improvement between the pretest and the posttest was observed for Group 2, which was exposed to the expletive elements

explicitly, and it was seen only in one of the schools that comprised that group: School 2. The improvement was observed both for *It*-sentences, which were explicitly stressed during the lessons, and for *PVS*-sentences, which were not mentioned in class (cf. section 5.3.2.2). The children were exposed to 17 instances of *It* and 17 instances of *There*, one of which included a post-verbal subject: "In a kingdom far, far away, **there** lives a kind prince."⁵¹ Thus, the improvement in post-verbal subjects might have been due to a generalization they made, based on 16 instances of "there is/are" and a single instance of "there lives." That is, the entire set of the *There*-sentences might have enabled the participants to deduce that the subject position cannot be null, thus triggering the improvement in *PVS*-sentences.

Recall that prior to the teaching sessions, "there is/are" was mistakenly analyzed as a single unit, rather than as a subject and a verb (cf. section 4.4). Due to the explicit positive evidence concerning the expletives *It* and *There*, I anticipated a change in the participants' analysis of existential constructions towards the correct subject-plus-verb construction, and indeed, improvement was noted in Group 2, School 2 for *There*-sentences as well (from 93% to 97%). Nevertheless, since this sentence type had already achieved high accuracy levels on the pretest, there was no room for a significant improvement. If the participants learned how to analyze existential constructions correctly, and realized the phonetically realized subject in the construction involving a post-verbal subject ("*there* lives..."), they would be able to generalize about all post-verbal subjects that they are ungrammatical unless the subject position is filled by an expletive. Based on the significant improvement in *It* and *PVS*, it appears that explicit positive evidence of expletives indeed instigated the resetting of the Null Subject Parameter.

In the same breath, two findings that did not cohere with the resetting have to be accounted for: (i) Lack of improvement in *NTS*-sentences and (ii) Discrepancy between the two schools that Group 2 consisted of. First, the fact that the improvement in the use of expletives did not yield an improvement in *NTS* seems to contradict the cluster associated with the parameter. Recall that Rizzi (1982) even

⁵¹ "There" was not interpreted as a locative here, at least not by the pupils who listened during the lesson, since, as in all of the sentences, one of the pupils read the sentence aloud and then translated it into Hebrew. I immediately asked: "What didn't we translate?" and the pupils answered: "There." None of the participants questioned that answer, nor did they attempt to argue that "there" served as a locative.

considered both these properties under the umbrella name of subject omission. Not only did the participants of Group 2, School 2 not improve in *NTS*, their performance has actually deteriorated (although not significantly). This means that these children did not internalize the obligatoriness of phonetically realized thematic subjects, although they (seem to) have internalized the obligatoriness of expletive elements and of *SV* order (i.e., the ungrammaticality of post-verbal subjects with no expletive in the subject position). This is unexpected when assuming the cluster associated with the parameter. Among the pupils from School 1 in Group 2, an improvement was noted only for the expletives (both *It* and *There*), but this improvement was insignificant. These pupils' performance on *NTS* and on *PVS* deteriorated insignificantly.

A few possible explanations might account for these findings. One way to interpret the lack of clustering would be to conclude that there is parameter breakdown in L2 – either local (only the Null Subject Parameter is incapable of resetting) or global (all parameters are unresettable and each feature has to be learnt independently). However, such an explanation would have to reconcile the lack of clustering on the one hand with the fact that two properties did cluster on the other hand: the children from Group 2, School 2 improved both in expletives and in post-verbal subjects. It might be argued, then, that *NTS* does not form part of the cluster, but this seems very unlikely.

Another possibility to account for the partial clustering has to do with the quantity of the input the children received. Three texts and two 45-minute lessons might have been insufficient when triggering parameter resetting. If this account is in the right direction, longer exposure to the relevant data would trigger "full" clustering. However, as I noted before, I had no choice but to settle for this limited amount of time (cf. section 4.4).

An alternative account that might settle the contradiction between *NTS* and the other properties associated with the parameter concerns the tense of the verbs (future) that appear in the Hebrew sentences examining the *NTS* property. As mentioned in section 4.3, the future tense was used in the *NTS*-sentences because the past tense was not sufficiently familiar to the participants. Since the future and the imperative forms of the verb are identical in Modern Hebrew, the participants could have interpreted the Hebrew future sentences as imperatives. This

interpretation would cohere with the acceptance of English null subjects, as those are allowed in imperative constructions. This could have been the case in the second person – both singular and plural – and in the first person plural (cohortative use). All in all, these sentences constituted four out of the six *NTS*-sentences. Indeed, the mean percentage of mistakes in both the second-person sentences (37%) and the first-person-plural sentences (28%) was greater than the percentage of mistakes in the first-person-singular sentences (24%). The confusion between the imperative and the future forms thus seems like a good explanation for the lack of improvement in *NTS*, reconciling the fact that this property seemingly did not cluster with the remaining three properties.

An additional explanation has to do with the difference between the sentences that examined the participants' proficiency in *NTS* and the sentences examining the other properties. The former were more complex than the latter, as they constituted of two sentences connected via "so." For example: "You are hungry, so *(you) will order two pizzas" [*NTS*] as opposed to "*(There) is a big dog in the yard" [*There*], "*(It) is very cold in our room" [*It*] and "*(Will) open two new malls in Ramat Hasharon" [*PVS*]. It might be that providing simpler *NTS*-sentences, such as "*(You) will order two pizzas" would have elicited higher accuracy levels, but I chose to incorporate the longer option in the test in order to provide the participants with the proper context for omission. The possible explanation for the lack of improvement in *NTS* might be, then, that the pupils found it difficult to choose a translation for complex sentences, perhaps due to lack of proficiency in L2 English, which might have enhanced the load on working memory.

It may also be the case that the parameter is currently being reset. Since the accuracy levels in the different sentence types do not tend to 0%, but rather, to 100%, it can be inferred that the process of resetting the parameter is taking place, but it is not complete at this stage of the acquisition. This transitional phase can account for the fluctuation in the accuracy levels the children achieved in the different sentence types. It is thus expected that, when I check their proficiency a few months later, the participants will have gained control over all of the parameter properties, including the *NTS* property, once the process of resetting is finalized.

The second problematic finding concerns the discrepancy between School 1 and School 2: Why did only School 2 improve significantly in *It* and *PVS*? When

teaching in the two schools, I could sense a great gap in the English level of the schools, only in the classes belonging to Group 2. For instance, when I tried to hold the discussion in English (rather than in Hebrew), the Group 2 pupils from School 1 were surprised and asked me to switch into Hebrew. Even though I talked slowly and explained in Hebrew every sentence I said immediately after saying it, the School 1 participants seemed to have difficulties in understanding me. In contrast, in School 2, I could actually hold the discussion in English with some of the pupils. This indicates that the participants from School 2 have already internalized some of the English grammar, and were thus more attuned to the input they were provided with. Moreover, the explicit positive evidence was more likely to affect pupils who had already gained access to the English grammar.

To sum up, based on the comparison between Group 1 and Group 2, explicit positive evidence turned out to be more helpful than natural positive evidence in improving L2 learning. It remains inconclusive why improvement in the expletives *it* and *there*, alongside improvement in post-verbal subjects, did not yield an improvement in thematic null subjects, although a problem with the *NTS*-sentences in terms of their complex structure (two combined sentences) and their ambiguous tense (future/imperative) seems like a good direction in accounting for this discrepancy. A confounding factor might have been responsible for the different performance on *NTS*. The beneficial effect of explicit positive evidence in the classroom in terms of the Null Subject Parameter was also seen in Gracia Mayo (1998). In contrast to White (1990), positive evidence does seem sufficient in instigating change in the L2 grammar, but it has to be emphasized explicitly.⁵² In other words, there was no need for negative evidence in the case of the children who participated in the current study, as the desired change was achieved via explicit positive evidence alone.

⁵² Isabelli (2004) shows that exposure to high quality and robust positive evidence (9-months stay in an L2-speaking country) is sufficient in instigating a restructuring of the L2 grammar (Spanish) in the case of the Null Subject Parameter. However, since a naturalistic environment is not always available in L2 learning, explicit positive evidence seems to serve as a satisfactory compromise.

6.3. Post-posttest

This test's purpose was twofold. First, it was meant to see whether the parameter can be reset. If indeed the positive evidence the participants were exposed to during the teaching sessions was sufficient to instigate resetting and the posttest recorded the participants in the midst of the process of resetting, one would expect the parameter value to fully change into the L2 value by now. Second, having established that explicit positive evidence is more helpful than mere exposure to data (i.e., natural positive evidence) in improving L2 learning, the post-posttest was meant to expose whether knowledge acquired via explicit positive evidence is retained in the long run. That is, it sought to discover whether the significant improvement in the sentences involving *It* and *PVS*, that was seen in Group 2, School 2 in the posttest, was retained four months after the posttest.

The first expectation was partially borne out. For some of the participants: 38% from Group 1 and 12% from Group 2, the resetting was finalized (see section 5.4.2.2). This conclusion is strengthened by the lack of main effect for Sentence Type. In the post-posttest, none of the different properties associated with the parameter differed significantly in its accuracy level from another property (cf. section 5.4.2.2 again). Recall that this was not the case in either the pretest or the posttest (see sections 5.1.1.2 and 5.2.2.2). The lack of differences indicates more uniform patterns in the different sentence types, as a cluster would predict.

The discrepancy between Group 1 and Group 2 in terms of the amount of participants attaining top performance can be attributed to the initial discrepancy between the two groups. The Group 1 pupils have acquired the obligatoriness of *There* in existential constructions, which were explicitly taught in school, and were more or less at the same accuracy level in the remaining sentence types, that were not mentioned in school (see graph 15 in section 5.5.2.2). This pattern was seen in all three tests. In contrast, in Group 2 the discrepancy between the different sentence types was much greater to begin with (see graph 16 in section 5.5.2.2). Since the initial accuracy levels in the different properties were non-uniform, it was unlikely that all of the properties would improve at the same pace (e.g., the distance between 60% and 100% accuracy in *It* differs from the gap between 41% and 100% accuracy in *PVS*, and therefore, simultaneous acquisition of these properties seems less plausible). Thus, if, for example, a participant from Group 1 improved equally in

two of the properties, s/he would gain top performance on both properties at approximately the same time. On the other hand, if a Group 2 participant improved evenly in two properties, s/he would not fully master both properties concurrently. This means that even if Group 2 improved significantly in two of the properties, its participants would not necessarily reach top performance on both properties together.

Leaving aside the discussion of the top-performance participants, let us now turn to the remaining participants, who did not reach perfect performance on the different sentence types. This portion of the participants was more prominent, as is evident from the fact that none of the properties reached 100% accuracy in any of the groups and in any of the schools (cf. sections 5.4.2.2 and 5.4.3.2). It might be that those who perfectly mastered all of the properties had higher level of English than those that did not, and hence the small amount of input they were exposed to was enough to instigate the relevant change in them. However, the weaker pupils were in need of more input in order for the resetting to take place, input that they lacked in the current study. Indeed, all of those that achieved perfect performance on all of the properties, from both groups, had high English Grades (above 90). However, there were also good students that did not reach top accuracy levels (28% in Group 1; 38% in Group 2). Perhaps those still needed more input, in spite of their high level of English.

As for the retaining of knowledge, regarding the inter-group difference, it seems that the improvement achieved via explicit positive evidence in Group 2 was retained. The significant difference between Groups 1 and 2 in the pretest was rendered insignificant following the teaching sessions (in the posttest), and has remained this way four months after the teaching sessions (in the post-posttest; see section 5.4.1.1). That is, the general level of the Group 2 children has thus improved. Regarding the specific properties that improved significantly immediately following the teaching sessions in Group 2, School 2 (*It* and *PVS*, cf. section 5.3.2.2), this more specific improvement also seems to be preserved. The mild deterioration noted in the post-posttest results did not differ significantly from the posttest results in any of the sentence types (see section 5.5.3.2).

It is important to note that the post-posttest results for Group 2 in School 2 did not differ significantly from the pretest either, a finding that does cast doubt on

the retaining of knowledge acquired via explicit positive evidence in the long run. It is possible that the latter does not affect the learner's unconscious linguistic competence in the L2, and therefore, it cannot trigger parameter resetting. If that is indeed the case, the properties that the Group 2, School 2 participants became proficient in are not grammar-based, but rather form part of a separate system of learnt linguistic knowledge (Schwartz and Gubala-Ryzak 1992, Schwarz 1993). Group 1, on the other hand, showed higher percentages of perfect performance in the post-posttest. The latter may be attributed either to these participants' exposure to natural positive evidence or to their better learning skills (or both).

A peculiar result seen in the post-posttest is the fact that Group 2 in School 1 improved significantly only in *PVS*-sentences between the posttest and the post-posttest (see section 5.5.3.2). It may be that the effect seen in School 2 in the posttest was delayed in School 1, appearing only in the post-posttest. Recall that the School 1 students of Group 2 were of lower competence than their School 2 peers in the pretest, the posttest and the pretest-posttest-post-posttest comparison (cf. sections 5.1.2.1, 5.2.2.1 and 5.5.2.1). Hence, it might be the case that more time was needed for the input to sink in and instigate the desired change in these participants. However, no significant effect for School was seen in the post-posttest (see section 5.4.2.1). It seems that the significant improvement of School 2 in the *PVS* sentence type has removed the significant effect between the two schools. It remains unclear why Group 2 in School 1 did not improve significantly in *It*-sentences – either in the posttest or in the post-posttest.

7. CONCLUSIONS

The experiment performed in the current study indicated that L1 transfer indeed takes place. Via a translation-choice task, I discovered that Hebrew-speaking 6th-graders who have been learning English for 4.5 years, accept null and post-verbal subjects in the non-null-subject L2: English. That is, the children seem to have inherited the value for the Null Subject Parameter from their L1, a partial null-subject language. These findings support hypotheses that suggest full transfer from the L1. It was also clear that these children are aware of the interlanguage differences between their L1 and L2, since in the majority of the cases they phonetically realized the subject position in L2 English sentences, although their L1 would allow such positions to remain null.

It was further seen that following exposure to texts that are abundant with expletive elements, alongside explicit emphasis upon these elements (Group 2), a significant improvement was noted in two of the properties associated with the parameter: the obligatoriness of expletives (in particular *it*) and the impossibility of post-verbal subjects. Since the improvement in the two properties was simultaneous, it seems to confirm the notion of a feature cluster, and may thus indicate full access to UG during L2 acquisition. However, the fact that the obligatoriness of thematic subjects did not ameliorate, while two of the other properties associated with the parameter did improve, casts some doubt on this inference. Nevertheless, this discrepancy may be accounted for on methodological grounds: the sentences testing the participants on this specific property were flawed in the sense that they might have been interpreted as imperative sentences, where subject omission would be allowed in the L2 English. Moreover, these sentences were more complex than the other sentences, and this might have had a negative effect on the participants' performance. It remains inconclusive whether this is indeed the reason for the stagnant performance on *NTS* between the pretest and the posttest. As a result, it also remains uncertain whether the L2 learner indeed has access to UG or not.

While the improvement in two of the features associated with the parameter was immediate, four months after the posttest, without further exposure (whether explicit or not) to expletive elements, the participants did not fully maintain this improvement. The post-posttest results were not significantly different either from the posttest or from the pretest. This might suggest that for the participants from

Group 2, School 2, the parameter was not reset following the teaching sessions, and the explicit positive evidence did not affect the learners' linguistic competence. Rather, a separate mechanism of metalinguistic knowledge was affected by the explicit positive evidence. Without practicing this knowledge in the interim between the posttest and the post-posttest, it was simply forgotten. As for the Group 1 participants, it remains unclear whether the acquisition of all of the properties examined in this study may be attributed to the texts the children were exposed to (i.e., positive evidence), or to the pupils' developed learning skills, which were a lot more prominent in Group 1, already in the pretest.

It would thus be interesting to repeat this study with groups that are more or less parallel in their proficiency in English, and to see whether the results are any different. Moreover, another interesting direction would be to perform this study with longer exposure to expletive elements, via more texts that abound with expletives, as well as via dialogues and auditory input.

Several issues thus remain unanswered:

- Is there full access to UG in L2 acquisition?
- Are developed learning skills more beneficial than explicit positive evidence in processes of restructuring in the interlanguage grammar?
- Is the feature cluster of the Null Subject Parameter fully accessible in L2 acquisition? If not, why does the feature of null thematic subjects have to be acquired independently?

In any event, what is clear from this study is that for quick results, explicit positive evidence (Group 2) has a major advantage over "natural" positive evidence (Group 1) in parameter resetting in L2 acquisition. However, this advantage is short-term, at least when the exposure period is very limited. It seems that in second language acquisition, like in any other realm in life, easy come, easy go.

APPENDIX I – TEACHING MATERIALS

The texts appear in the exact order in which they were delivered in class. Below each text there appears a list of possible questions for discussion during the lesson. In each text, the expletive elements (*it, there*) are marked in bold.

- (I) **It** is summer now, and **it** is very hot outside. **There** are many people at the beach. **There** is a little girl playing in the sand. Her name is Dana. She is building a palace. She will build a huge palace, like the palace that she built last time. She will soon finish. Then she will show the palace to her mother. **There** is a woman looking at Dana: it's Dana's mother. She is photographing Dana. She is smiling because she loves Dana so much. Dana looks up from the palace and smiles back at her mother. What a lovely picture! Suddenly, Dana hears a dog. She looks around. **There** is a cute, brown dog sitting next to her. It is wagging its tail. Dana loves dogs, so she hugs the dog right away. The dog starts licking her face, and Dana is laughing. **It** is sunny and **there** are no clouds in the sky. **It** is nice and cozy outside! Dana is happy because she loves the summer.

[4 instances of *it*, 5 instances of *there*]

170 words



Possible Questions for Discussion:

- a. What is the season in the story?
- b. Is it hot or cold outside?
- c. Who is Dana?
- d. Where is she?
- e. Who else is there?
- f. What is Dana doing?
- g. What is Dana's mother doing?
- h. What is the dog doing?
- i. Why is Dana happy?

j. Who is in the picture?

k. Does the picture tell the entire story? Is there something/someone that is missing from the picture?

l. Is there something in the picture that is missing from the story?

(II) Shelley goes to the cinema. She enters the building. At first **it** is chilly inside, but soon **it** gets very cold. She is happy because she has a sweater in her bag. She pulls the sweater out of her bag and puts it on. Now **it** is not so cold inside. **There** are only a few people at the cinema. They are all waiting for the movie to start. Just before the lights go out, a man comes in and sits next to Shelley. **It** is suddenly dark and the movie starts. The movie is funny, and Shelley really enjoys it. She can't stop laughing! **There** are other people around her who laugh a lot. But the man who is sitting next to her is really quiet during the entire movie. He disappears before the end of the movie. When the lights go on, Shelley understands that her bag disappeared, too! She is so angry with herself! How didn't she see that he stole her bag? **There** was a lot of money in her purse, and she feels so bad about losing it... But then she sees something on the floor next to her seat! **There** is a black purse right next to her left shoe – HER black purse! Perhaps she dropped it by mistake when she took her sweater out of her bag. After all, she feels lucky **it** is so cold at the cinema. Otherwise, that thief could take all her money. You can only imagine how happy she is to find her lost purse. So, the next time you're at the cinema and you're cold, think about Shelley's story: **There's** a good reason why **it** is so freezing at the cinema!

[6 instances of *it*, 5 instances of *there*]

285 words



Possible Questions for Discussion:

a. Who is Shelley?

- b. Where is she?
- c. Who else is there?
- d. How does it feel there?
- e. What is Shelley doing?
- f. Who is the man sitting next to her?
- g. What does he do?
- h. Shelley is angry at a certain point in the story. Why? Who is she angry with?
- i. Why is she happy later on?
- j. How does Shelley explain why her purse was on the floor? Can you think of another explanation?
- k. What is "the good reason why it is so freezing at the cinema"?
- l. Who is in the picture?
- m. Does the picture tell the entire story? Is there something/someone that is missing from the picture?
- n. Is there something in the picture that is missing from the story?

(III) In a kingdom far, far away, **there** lives a kind prince. The prince lives in a beautiful palace because he is very rich. In the palace **there** are 25 rooms, and in each room **there** is a lot of gold.

One day, the prince notices that **there** are many clouds in the sky. Then **it** starts raining. **It** doesn't stop raining for a few hours. In the middle of the night, the prince hears a knock on the door. He thinks the noise is coming from the storm, because **it** is very windy outside. The prince decides that the rain or the wind are making the noise, but then **there** is another knock. **It** is night, and all the servants are sleeping. So the prince goes to see for himself who is knocking on the door. He opens the heavy door of his palace. At the entrance **there** is a very old man with a white, long beard. The old man looks wet and tired. He is so weak he almost falls. The prince invites him in. Inside the palace **it** is nice and cozy. The prince can see that the old man is hungry, so he offers him some food. The old man thanks the prince. The prince lets the man sleep in one of the many rooms of his palace.

As morning approaches, **it** stops raining and the clouds disappear. In the morning, the prince is surprised to discover that the old man is gone! But he is even more surprised to find out that the palace changed completely. Now

there are 50 rooms in the palace instead of 25! And the gold? The gold doubled!

"How could this happen?" the prince thinks and thinks, but **it** is very difficult to find an explanation.

[7 instances of *it*, 7 instances of *there*]

297 words



Possible Questions for Discussion:

- a. In your opinion, what is your explanation for what happens? Why are there more rooms and gold in the end of the story?
- b. What is the season in the story?
- c. Is it hot or cold outside?
- d. Where does the prince live?
- e. What can we find inside his palace?
- f. Who else is in the palace?
- g. What does he look like?
- h. Why does the prince open the door?
- i. Where are the prince's servants?
- j. What does the prince do after he opens the door?
- k. What happens after that?
- l. Who is in the picture?
- m. Does the picture tell the entire story? Is there something/someone that is missing from the story?
- n. What do you think about the behavior of the prince? Would you do the same?
- o. Why do you think that the old man disappeared?
- p. This story has "an open ending." Why do you think it is called this way? Do you like this kind of ending? Why? Why not?

APPENDIX II – TESTS

For the sake of presentation, there is no division here between the different test versions. Every two consecutive questions form a couple of parallel Hebrew sentences that are identical in terms of word number and syntactic structure. Each member of such a couple appeared in a different version of the test. All of the sentences involving null pronominal subjects provide the proper context for subject omission. That is, the subject is overt in the beginning of the sentence, and is then omitted. Moreover, relying on the mixed null subject pattern observed in Hebrew, I did not incorporate any third-person null thematic subjects in the assignments, as those would not be omitted in Hebrew. Lastly, as was mentioned above, the only tenses incorporated in the task are present and future, since the participants have not yet gained control over the past tense. In accordance with the Hebrew pattern, null thematic subjects appear only in the future tense.

הוראות: עבור כל משפט בעברית, מופיעים ארבעה תרגומים לאנגלית.
יש **תרגום אחד** שנשמע טוב באנגלית ומתאים למשפט בעברית. הקיפו אותו בעיגול.

Instructions: For every sentence in Hebrew, there are four translations into English.

There is **one translation** that sounds good in English and is appropriate for the sentence in Hebrew. Circle it.⁵³

I. Null Thematic Subjects

Target Sentences

1. אתה עייף מאוד, אז תלך למיטה בקרוב.
ata ayef me'od az telex la-mita be-karov
you.SG.MSC. tired.SG.MSC. very so will-go.2SG.MSC. to-the-bed in- soon

- You are tired very, so will go to bed soon.
- You are very tired, so you will go to bed soon.
- You are very tired, so will go to bed soon.
- You are tired very, so you will go to bed soon.

⁵³ In the tests themselves, the instructions appeared only in Hebrew.

2. את מצחיקה מאוד, אז תספרי בדיחה בקרוב.

at macxika me'od az tesapri bdixa be-karov
you.SG.FM. funny.SG.FM. very so will-tell.2SG.FM. a-joke in- soon

- a. You are funny very, so will tell a joke soon.
- b. You are very funny, so you will tell a joke soon.
- c. You are very funny, so will tell a joke soon.
- d. You are funny very, so you will tell a joke soon.

3. אני אוהבת סרטים, אז אלך לקולנוע מחר.

ani ohevet sratim az elex la- kolno'a maxar
I like.SG.FM. movies so will-go.1SG. to-the-cinema tomorrow

- a. I like a movie, so I will go to the cinema tomorrow.
- b. I like movies, so will go to the cinema tomorrow.
- c. I like movies, so I will go to the cinema tomorrow.
- d. I like a movie, so will go to the cinema tomorrow.

4. אני אוהב בגדים, אז אלך לקניון מחר.

ani ohev bgadim az elex la- kenyon maxar
I like.SG.MSC. clothes so will-go.1SG. to-the-mall tomorrow

- a. I like clothes, so I will go to the malls tomorrow.
- b. I like clothes, so will go to the mall tomorrow.
- c. I like clothes, so I will go to the mall tomorrow.
- d. I like clothes, so will go to the malls tomorrow.

5. אני צופה בטלוויזיה עכשיו, אז אתקשר אליך אחר-כך.

ani cofe ba- televizya axšav az etkašer elexa
I am-watching.SG.MSC. in-the-TV now so will-call.1SG. to-you
axar-kax
after-this

- a. I am watching TV now, so I will call you later.
- b. I am watching TV now, so will call you later.
- c. I am watching TV now, so I will see you later.
- d. I am watching TV now, so will see you later.

6. אני כותבת מכתב עכשיו, אז אקשיב לך אחר-כך.

ani kotevet mixtav axšav az akšiv lax axar-kax
I am-writing.SG.FM. a-letter now so will-listen.1SG. to-you after-this

- a. I am writing a story now, so I will listen to you later.
- b. I am writing a letter now, so will listen to you later.
- c. I am writing a letter now, so I will listen to you later.
- d. I am writing a story now, so will listen to you later.

7. אנחנו מזמינים חברים, אז נבשל ארוחה.

anaxnu mazminim xaverim az nevašel aruxa
we are-inviting.PL.MSC. friends so will-cook.1PL. a-meal

- a. We are inviting friends, so will cook a meal.
- b. We are inviting friends, so we will cook meals.
- c. We are inviting friends, so will cook meals.
- d. We are inviting friends, so we will cook a meal.

8. אנחנו יוצאים לטיול, אז נקנה חטיפים.

anaxnu yoc'im le-tiyul az nikne xatifim
we are-going.PL.MSC. to-trip so will-buy.1PL. snacks

- a. We are going on a trip, so will buy snacks.
- b. We are going on a trip, so we will buy a snack.
- c. We are going on a trip, so will buy a snack.
- d. We are going on a trip, so we will buy snacks.

9. אנחנו בחוף הים, אז נבנה ארמון גדול.

anaxnu be-xof ha-yam az nivne armon gadol
we in-shore-of the-sea so will-build.1PL. a-palace big

- a. We are at the beach, so we will build a big palace.
- b. We are at the beach, so will build a big palace.
- c. We are at the beach, so we will build a palace big.
- d. We are at the beach, so will build a palace big.

10. אנחנו בקולנוע החדש, אז נראה סרט מצחיק.

anaxnu ba-kolno'a ha-xadaš az nir'e seret macxik
we in-the-cinema the-new so will-watch.1PL. a-movie funny

- a. We are at the new cinema, so we will watch a funny movie.
- b. We are at the new cinema, so will watch a funny movie.
- c. We are at the new cinema, so we will watch a movie funny.
- d. We are at the new cinema, so will watch a movie funny.

11. אתם צמאים, אז תיקנו שלושה בקבוקים.

atem cme'im az tiknu šloša bakbukim
you.PL.MSC. thirsty.PL.MSC. so will-buy.2PL. three bottles

- a. You are thirsty, so will buy three bottles.
- b. You are thirsty, so you will buy three bottles.
- c. You are thirsty, so will buy three bottle.
- d. You are thirsty, so you will buy three bottle.

12. אתם רעבים, אז תזמינו שתי פיצות.

atem re'evim az tazminu štey picot
you.PL.MSC. hungry.PL.MSC. so will-order.2PL. two pizzas

- a. You are hungry, so will order two pizzas.
- b. You are hungry, so you will order two pizzas.
- c. You are hungry, so will order two pizza.
- d. You are hungry, so you will order two pizza.

Fillers

1. היא אוכלת גלידה, אז אני אשתה מילקשייק.

hi oxelet glida az ani ešte milkšeik
she is-eating.SG.FM. ice-cream so I will-drink.1SG. milkshake

- a. She is eating ice-cream, so I will drink milkshake.
- b. She is eating ice-cream, so I will buy milkshake.
- c. She is eating ice-cream, so I will make milkshake.
- d. She is eating ice-cream, so he will drink milkshake.

2. היא אוכלת עוגיה, אז אני אשתה קפה.

hi oxelet ugiya az ani ešte kafe
she is-eating.SG.FM. a-cookie so I will-drink.1SG. coffee

- a. She is eating a cookie, so I will drink coffee.
- b. She is eating a cookie, so I will buy coffee.
- c. She is eating a cookie, so I will make coffee.
- d. She is eating a cookie, so he will drink coffee.

3. הן נוסעות לאט, אז הן יאחרו לבית הספר.

hen nos'ot le'at az hen ye'axru
they.FM. are-driving.PL.FM. slowly so they.FM. will-be-late.3PL.
le-bet ha-sefer
to-house-of the-book

- a. They are walking slowly, so they will be late for school.
- b. They are running slowly, so they will be late for school.
- c. They are driving slowly, so you will be late for school.
- d. They are driving slowly, so they will be late for school.

4. הן הולכות לאט, אז הן יאחרו לשיעור.

hen holxot le'at az hen ye'axru la- š'ur
they.FM. are-walking.PL.FM. slowly so they.FM. will-be-late.3PL. to-the-lesson

- a. They are driving slowly, so they will be late for the lesson.
- b. They are running slowly, so they will be late for the lesson.

- c. They are walking slowly, so you will be late for the lesson.
- d. They are walking slowly, so they will be late for the lesson.

5. הוא לומד עכשיו, אז אנחנו נשחק אחר-כך.

hu lomed axšav az anaxnu nezaxek axar-kax
 he is-studying.SG.MSC. now so we will-play.1PL. after-this

- a. He is studying now, so we will talk later.
- b. He is studying now, so we will eat later.
- c. He is studying now, so he will play later.
- d. He is studying now, so we will play later.

6. הוא אוכל עכשיו, אז אנחנו נדבר אחר-כך.

hu oxel axšav az anaxnu nedaber axar-kax
 he is-eating.SG.MSC. now so we will-talk.1PL. after-this

- a. He is eating now, so we will dance later.
- b. He is eating now, so we will play later.
- c. He is eating now, so he will talk later.
- d. He is eating now, so we will talk later.

II. Null Expletive Subjects

There

1. יש קשת יפה בשמיים. *yeš kešet yafa ba- šama'im*
 is rainbow beautiful in-the-sky

- a. Is a rainbow beautiful in the sky.
- b. There is a rainbow beautiful in the sky.
- c. Is a beautiful rainbow in the sky.
- d. There is a beautiful rainbow in the sky.

2. יש כלב גדול בחצר. *yeš kelev gadol ba- xacer*
 is dog big in-the-yard

- a. Is a dog big in the yard.
- b. There is a dog big in the yard.
- c. Is a big dog in the yard.
- d. There is a big dog in the yard.

3. יש הרבה תפוחים במקרר. *yeš harbe tapuxim ba- mekarer*
 is a-lot apples in-the-fridge

- a. There are many apples in the fridge.
- b. Are many oranges in the fridge.
- c. There are many oranges in the fridge.
- d. Are many apples in the fridge.

4. יש הרבה צעצועים בקופסה.
yeš harbe ca'acu'um ba- kufsa
is a-lot toys in-the-box

- a. There are many dolls in the box.
- b. Are many toys in the box.
- c. There are many toys in the box.
- d. Are many dolls in the box.

5. יש שלושה סוודרים שחורים בארון.
yeš šloša svederim šxorim ba- aron
is three sweaters black.PL.MSC in-the-closet

- a. There are three black sweaters in the closet.
- b. Are three black sweater in the closet.
- c. There are three black sweater in the closet.
- d. Are three black sweaters in the closet.

6. יש חמישה עפרונות צהובים בתיק.
yeš xamiša efronot cehubim ba- tik
is five sweaters yellow.PL.MSC in-the-bag

- a. There are five yellow pencils in the bag.
- b. Are five yellow pencil in the bag.
- c. There are five yellow pencil in the bag.
- d. Are five yellow pencils in the bag.

7. יש כלבלב על המיטה שלי.
yeš klavlav al ha- mita šeli
is a-puppy on-the-bed my

- a. Is puppies on my bed.
- b. There is a puppy on my bed.
- c. Is a puppy on my bed.
- d. There is puppies on my bed.

8. יש חתול מתחת לספה שלנו.
yeš xatul mi- taxat la-sapa šelanu
is a-cat from-under to-the-sofa our

- a. Is cats under our sofa.
- b. There is a cat under our sofa.
- c. Is a cat under our sofa.
- d. There is cats under our sofa.

9. יש עוגת שוקולד על השולחן.
yeš ugat šokolad al ha- šulxan
is a-cake-of chocolate on-the-table

- a. Is a chocolate cake on the table.
- b. There is a cake chocolate on the table.

- c. Is a cake chocolate on the table.
- d. There is a chocolate cake on the table.

yeš sefer adom al ha- madaf 10. יש ספר אדום על המדף.
is a-book red.SG.MSC. on the-shelf

- a. Is a red book on the shelf.
- b. There is a book red on the shelf.
- c. Is a book red on the shelf.
- d. There is a red book on the shelf.

yeš anan afor ba- šama'im 11. יש ענן אפור בשמיים.
is a-cloud grey.SG.MSC. in-the-sky

- a. There is grey clouds in the sky.
- b. Is grey clouds in the sky.
- c. There is a grey cloud in the sky.
- d. Is a grey cloud in the sky.

yeš koxav katan ba- šama'im 12. יש כוכב קטן בשמיים.
is a-star small.SG.MSC. in-the-sky

- a. There is small stars in the sky.
- b. Is small stars in the sky.
- c. There is a small star in the sky.
- d. Is a small star in the sky.

It

kar me'od ba- xeder šelanu 1. קר מאוד בחדר שלנו.
cold very in-the-room our

- a. It is very cold in our rooms.
- b. Is very cold in our rooms.
- c. It is very cold in our room.
- d. Is very cold in our room.

xam me'od ba- kita šelanu 2. חם מאוד בכיתה שלנו.
hot very in-the-classroom our

- a. It is very hot in our classrooms.
- b. Is very hot in our classrooms.
- c. It is very hot in our classroom.
- d. Is very hot in our classroom.

yored gešem be-eylat axšav 3. יורד גשם באילת עכשיו.
is-descending.MSC. rain in- Eilat now

- a. It is raining in Gilat right now.
- b. Is raining in Gilat right now.
- c. It is raining in Eilat right now.
- d. Is raining in Eilat right now.

yored *šleg be-yerušalayim* 4. יורד שלג בירושלים עכשיו.
 is-descending.MSC. snow in-Jerusalem
axšav
 now

- a. It is snowing in Yeruham right now.
- b. Is snowing in Yeruham right now.
- c. It is snowing in Jerusalem right now.
- d. Is snowing in Jerusalem right now.

yihye *me'od xam hayom* 5. יהיה מאוד חם היום.
 will-be.3SG.MSC. very hot today

- a. Will be hot very today.
- b. It will be very hot today.
- c. Will be very hot today.
- d. It will be hot very today.

yihye *me'od kar hayom* 6. יהיה מאוד קר היום.
 will-be.3SG.MSC. very cold today

- a. Will be very cold today.
- b. It will be very cold today.
- c. Will be cold very today.
- d. It will be cold very today.

yered *šleg maxar* 7. יורד שלג מחר בבוקר.
 will-descend.3SG.MSC. snow tomorrow
ba- boker
 in-the-morning

- a. It will snow morning tomorrow.
- b. Will snow tomorrow morning.
- c. It will snow tomorrow morning.
- d. Will snow morning tomorrow.

yered *gešem maxar* 8. יורד גשם מחר בערב.
 will-descend.3SG.MSC. rain tomorrow
ba- erev
 in-the-evening

- a. It will rain evening tomorrow.
- b. Will rain tomorrow evening.
- c. It will rain tomorrow evening.
- d. Will rain evening tomorrow.

9. יהיה גשום בחיפה היום. *yihye gašum be-xaifa hayom*
will-be.3SG.MSC. rainy in-Haifa today

- a. Will be rainy in Haifa today.
- b. It will be rainy in Haifa tomorrow.
- c. Will be rainy in Haifa tomorrow.
- d. It will be rainy in Haifa today.

10. יהיה מעונן בלוד מחר. *yihye me'unan be-lod maxar*
will-be.3SG.MSC. cloudy in-Lod tomorrow

- a. Will be cloudy in Lod today.
- b. It will be cloudy in Lod tomorrow.
- c. Will be cloudy in Lod tomorrow.
- d. It will be cloudy in Lod today.

11. יהיה חשוך בקולנוע הערב. *yihye xašux ba- kolno'a*
will-be.3SG.MSC. dark in-the-cinema
ha-erev
the-evening

- a. Will be dark near the cinema this evening.
- b. It will be dark at the cinema this evening.
- c. Will be dark at the cinema this evening.
- d. It will be dark near the cinema this evening.

12. יהיה קריר בבית הלילה. *yihye karir ba- ba'it ha-layla*
will-be.3SG.MS. chilly in-the-house the-night

- a. Will be chilly near the house tonight.
- b. It will be chilly in the house tonight.
- c. Will be chilly in the house tonight.
- d. It will be chilly near the house tonight.

III. Post-Verbal Subjects

Target Sentences

1. יבואו המון אנשים לחתונה של אחותי. *yavo'u hamon anašim la- xatuna šel axoti*
will-come.3PL. a-lot-of people to-the-wedding of my-sister

- a. Will come many people to my sister's weddings.
- b. Many people will come to my sister's wedding.
- c. Will come many people to my sister's wedding.
- d. Many people will come to my sister's weddings.

2. יגיעו המון ילדות למסיבה של אחותי.

yagi'u hamon yeladot la- mesiba šel axoti
will-arrive.3PL. a-lot-of girls to-the-party of my-sister

- a. Will arrive many girls to my sister's parties.
- b. Many girls will arrive to my sister's party.
- c. Will arrive many girls to my sister's party.
- d. Many girls will arrive to my sister's parties.

3. יופיעו כוכבים קטנים בשמיים מחר.

yofi'u koxavim ktanim ba- šama'im maxar
will-appear.3PL. stars small.PL.MSC. in-the-sky tomorrow

- a. Small stars will appear on the sky tomorrow.
- b. Will appear small stars on the sky tomorrow.
- c. Small stars will appear in the sky tomorrow.
- d. Will appear small stars in the sky tomorrow.

4. יופיעו עננים אפורים בשמיים מחר.

yofi'u ananim aforim ba- šama'im maxar
will-appear.3PL. clouds grey.PL.MSC. in-the-sky tomorrow

- a. Grey clouds will appear on the sky tomorrow.
- b. Will appear grey clouds on the sky tomorrow.
- c. Grey clouds will appear in the sky tomorrow.
- d. Will appear grey clouds in the sky tomorrow.

5. ייפלו הרבה עצים בסערה החזקה.

yiplu harbe ecim ba- se'ara ha- xazaka
will-fall.3PL. a-lot-of trees in-the-storm the-strong.SG.FM.

- a. Will fall many trees in the strong storms.
- b. Many trees will fall in the strong storms.
- c. Will fall many trees in the strong storm.
- d. Many trees will fall in the strong storm.

6. ייפלו הרבה תפוחים מהעצים בקיץ.

yiplu harbe tapuxim me- ha- ecim ba- ka'ic
will-fall.3PL. a-lot-of apples from-the-trees in-the-summer

- a. Will fall many apples from the tree in the summer.

- b. Many apples will fall from the tree in the summer.
- c. Will fall many apples from the trees in the summer.
- d. Many apples will fall from the trees in the summer.

7. יבואו שלושים אנשים לירושלים בשבוע הבא.

yavo'u šlošim anašim le-yerušala'im ba- šavu'a ha- ba
will-come.3PL. thirty people to-Jerusalem in-the-week the-next

- a. Thirteen people will come to Jerusalem next week.
- b. Will come thirteen people to Jerusalem next week.
- c. Thirty people will come to Jerusalem next week.
- d. Will come thirty people to Jerusalem next week.

8. יגיעו שלוש משפחות מאמריקה בשבוע הבא.

yagi'u šaloš mišpaxot me- america ba- šavu'a ha- ba
will-arrive.3PL. three families from-America in-the-week the-next

- a. Thirty families will arrive from America next week.
- b. Will arrive thirty families from America next week.
- c. Three families will arrive from America next week.
- d. Will arrive three families from America next week.

9. תגיע תלמידה חדשה בסוף החודש הזה.

tagi'a talmida xadaša be-sof ha- xodeš ha-ze
will-arrive.3SG.FM. a-student.FM. new.SG.FM. in-end-of the-month this.MSC.

- a. Will arrive a new student at the end of this month.
- b. A new student will arrive at the end of this month.
- c. Will arrive a student new at the end of this month.
- d. A student new will arrive at the end of this month.

10. תבוא מורה חדשה בתחילת השנה הזאת.

tavo mora xadaša be-txilat ha- šana ha-zot
will-come.3SG.FM.a-teacher.FM. new.SG.FM. in-beginning-of the-year this.FM.

- a. Will come a new teacher at the beginning of this year.
- b. A new teacher will come at the beginning of this year.
- c. Will come a teacher new at the beginning of this year.
- d. A teacher new will come at the beginning of this year.

11. ייפתחו עשר חנויות חדשות בכפר סבא.

yipatxu eser xanuyot xadašot be-kfar saba
will-open.3PL. ten stores new.PL.FM. in-Kfar Saba

- a. Ten stores new will open in Kfar Saba.
- b. Will open ten stores new in Kfar Saba.

- c. Ten new stores will open in Kfar Saba.
- d. Will open ten new stores in Kfar Saba.

12. ייפתחו שני קניונים חדשים ברמת השרון.

yipatxu šney kanyonim xadašim be-ramat hašaron
will-open.3PL. two malls new.PL.MSC. in-Ramat Hašaron

- a. Two malls new will open in Ramat Hasharon.
- b. Will open two malls new in Ramat Hasharon.
- c. Two new malls will open in Ramat Hasharon.
- d. Will open two new malls in Ramat Hasharon.

Fillers

1. כל הזהב ייעלם מהארמון מחר.

kol ha- zahav ye'alem me- ha-armon maxar
all the-gold will-disappear.3SG. from-the-palace tomorrow

- a. All the gold will disappear from the palace tomorrow.
- b. All the gold will disappear from the bank tomorrow.
- c. All the gold will disappear from the bag tomorrow.
- d. All the gold will disappear from the palace yesterday.

2. כל הכסף ייעלם מהבנק מחר.

kol ha- kesef ye'alem me- ha- bank maxar
all the-money will-disappear.3SG. from-the-bank tomorrow

- a. All the money will disappear from the bank tomorrow.
- b. All the money will disappear from the bag tomorrow.
- c. All the money will disappear from the palace tomorrow.
- d. All the money will disappear from the store yesterday.

3. הרבה שחקנים מפורסמים יופיעו בסרט החדש.

harbe saxkanim mefursamim yofi'u ba- seret
a-lot-of actors famous.PL.MSC. will-appear.3PL. in-the-movie
ha- xadaš
the-new.SG.MSC.

- a. Many famous actors will appear in the new movie.
- b. Many pretty actors will appear in the new movie.
- c. Many good actors will appear in the new movie.
- d. Many famous actors will appear in the new show.

4. הרבה שחקנים טובים יופיעו בתוכנית החדשה.

harbe saxkanim tovim yofi'u ba- toxnit ha- xadaša
a-lot-of actors good.PL.MSC. will-appear.3PL. in-the-movie the-new.SG.FM.

- a. Many good actors will appear in the new show.
- b. Many young actors will appear in the new show.
- c. Many famous actors will appear in the new show.
- d. Many good actors will appear in the new movie.

5. הספר הכחול ייפול על הרצפה.

ha- sefer ha- kaxol yipol al ha- ricpa
 the-book the-blue.SG.MSC. will-fall.3SG. on the-floor

- a. The red book will fall on the floor.
- b. The blue book will fall on the floor.
- c. The big book will fall on the floor.
- d. The blue books will fall on the floor.

6. הכדור הגדול ייפול על הרצפה.

ha- kadur ha- gadol yipol al ha- ricpa
 the-ball the-big.SG.MSC. will-fall.3SG. on the-floor

- a. The new ball will fall on the floor.
- b. The big ball will fall on the floor.
- c. The blue ball will fall on the floor.
- d. The big balls will fall on the floor.

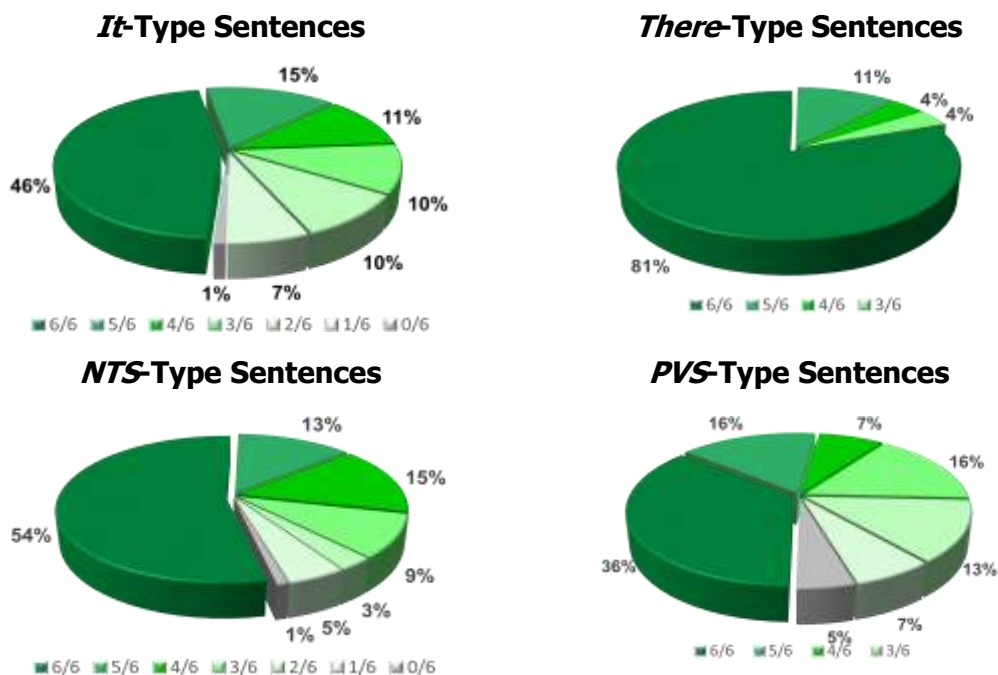
APPENDIX III – STATISTICAL ANALYSIS

I. Pretest

By-Subjects Analysis

The pie charts in (1) demonstrate the uneven distribution of participants in every accuracy level in each of the sentence types. The accuracy levels are taken out of six questions per sentence type. In grey I mark the participants that were wrong in six out of six sentences. In green – the participants who answered correctly on some of the sentences in the given sentence type. The different shades of green indicate how well they did: from a single correct answer out of six sentences to six correct answers out of six sentences.

(1) Pretest Results: Percentages of Participants for Each Accuracy Level in the Different Sentence Types



By-Items Analysis

The mistake amounts yielded by each of the sentences in every sentence type (six sentences per sentence type) were relatively uniform. None of the sentences deviated either from the minimum value or from the maximum value I had predetermined. Both were calculated according to the average amount of mistakes made in the specific sentence type under examination plus (maximum value) or minus (minimum value) 2.5 times the standard deviation of that sentence type.

II. Posttest

By-Subjects Analysis by Groups and by Schools

Interactions by Groups and by Schools

The interaction between Sentence Type and Learning Disabilities was insignificant for both groups, for each of the schools that comprised them. Regarding the analysis involving List as a between-subjects factor, Group 2, School 2 showed a significant interaction between Sentence Type and List: $F(3,54) = 3.21, p = .03^*$. This interaction was significant for the *It-NTS* and *It-PVS* contrasts. The accuracy levels were significantly higher for List 1 in *It* than they were in *NTS* or in *PVS*.

By-Items Analysis

In parallel with the pretest, the mistake amounts yielded by each of the sentences in every sentence type were relatively uniform. Recall that in the posttest a parallel-but-different variant of the pretest was used, but again, none of the sentences deviated either from the minimum value or from the maximum value I had predetermined (average amount of mistakes made in a certain sentence type plus or minus 2.5 times the standard deviation of that sentence type).

III. Pretest versus Posttest

By-Subjects Analysis

Between-Subjects Analysis

A 4X2X2 ANCOVA (covariate: English Grade) with Sentence Type (*It, There, NTS, PVS*) and Time (*pretest, posttest*) as within-subjects factors, and Group (Group 1, Group 2) as a between-subjects factor, revealed no main effect for Group.

Interactions

Regarding 2-way interactions, the interaction between Sentence Type and Group was highly significant for the contrasts of *There-PVS* and *NTS-PVS* [$F(3,198) = 4.53, p = .004^{**}$]. The Time-Group and Sentence Type-Time 2-way interactions were insignificant. The 3-way interaction between Sentence Type, Time and Group also turned out to be significant for the *It-NTS* and *NTS-PVS* contrasts [$F(3,198) = 3.98, p = .014^*$]. Mauchly's test indicated that the assumption of sphericity for the interaction between Sentence Type and Time had been violated ($p < .001^{**}$),

therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity. Group 2 performed significantly better on *It* than on *NTS* in the posttest, while in the pretest it was the other way around. Moreover, the difference between *NTS* and *PVS* in Group 2 was significantly larger in the pretest than in the posttest.

By-Subjects Analysis by Groups

Interactions by Groups

Regarding the between-subjects 4X2X2 analyses, the analysis where School served as a between-subjects factor revealed a significant 2-way interaction between Sentence Type and School only for Group 2, where School 2 performed significantly better than School 1 [$F(3,99) = 3.5, p = .018^*$]. The Time-School 2-way interaction was insignificant for both Groups. So was the 3-way interaction between Sentence Type, Time and School.

In the 4X2X2 analysis involving Learning Disabilities as a between-subjects factor revealed, both the 2-way interaction between Sentence Type and Learning Disabilities and the 3-way interaction between Sentence Type, Time and Learning Disabilities were insignificant in either of the Groups.

Concerning the within-subjects analysis (4X2 design), the 2-way interaction between Sentence Type and Time was significant only for Group 1 [$F(3, 93) = 5.03, p = .007^{**}$]. Mauchly's test indicated that the assumption of sphericity for the interaction between Sentence Type and Time had been violated for Group 1 ($p < .001^{**}$), and Greenhouse-Geisser estimates of sphericity were used. This interaction was significant for the *There-PVS* and for the *NTS-PVS* contrasts, as the difference in Group 1 between the accuracy in *PVS* and in *There* has decreased between the pretest and the posttest, whereas the difference in Group 1 between *NTS* and *PVS* has increased during that period of time.

By-Subjects Analysis by Groups and by Schools

Interactions by Groups and by Schools

The interaction between Sentence Type and Time was only significant in Group 1, School 2, for the contrasts of *It-PVS*, *There-PVS* and *NTS-PVS* [$F(3,42) = 4.22, p = .027^*$]. Mauchly's test indicated that the assumption of sphericity for the interaction

between Sentence Type and Time had been violated ($p = .04^*$), therefore Greenhouse-Geisser estimates of sphericity were used.

IV. Post-posttest

By-Items Analysis

In parallel with both the pretest and the posttest, I checked the amount of mistakes yielded by each of the sentences in every sentence type (six sentences per sentence type). Recall that in the posttest a parallel-but-different variant of the pretest was used. Again, the different sentences yielded similar amounts of mistakes, and none of the sentences deviated either from the minimum value or from the maximum value I had predetermined (average of mistakes in a sentence type plus or minus 2.5 times the standard deviation of that sentence type).

By-Subjects Analysis by Groups and by Schools

Interactions by Groups and by Schools

The interaction between Sentence Type and List was insignificant for both groups, for each of the schools. The interaction between Sentence Type and Learning Disabilities turned out highly significant only for Group 2, School 2 [$F(3,51) = 4.61, p = .006^{**}$]. This interaction was significant for three of the contrasts: *It-There*, *There-PVS* and *There-NTS*. That is, in Group 2, School 2, the participants diagnosed with learning disabilities demonstrated a significantly larger difference between *There* and the other sentence types (both in terms of mean accuracies and in terms of standard deviations), in comparison with their peers without learning disabilities.

V. Pretest versus Posttest versus Post-Posttest

By-Subjects Analysis

Interactions

Regarding 2-way interactions, the interaction between Sentence Type and Group was significant for the contrasts of *There-PVS* and *NTS-PVS* [$F(3,180) = 3.9, p = .01^*$]. So was the Sentence Type-Time interaction for the *It-There* and *There-PVS* contrasts both between the pretest and the posttest and between the posttest and the post-posttest, and for the *There-NTS* contrast only between the posttest and the post-posttest [$F(6,360) = 2.52, p = .031^*$]. Mauchly's test indicated that the

assumption of sphericity for the Sentence Type-Time interaction had been violated ($p = .001^{**}$), therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity. The Time-Group interaction was insignificant.

The 3-way interaction between Sentence Type, Time and Group turned out to be significant for the contrasts of *It-NTS*, *There-PVS* and *NTS-PVS*, only between the pretest and the posttest [$F(6,360) = 2.29, p = .048^*$]. Again, the assumption of sphericity for the Sentence Type-Time interaction had been violated ($p = .001^{**}$), so Greenhouse-Geisser estimates of sphericity were used.

By-Subjects Analysis by Groups

Interactions by Groups

Concerning the within-subjects analysis (4X3 design), the 2-way interaction between Sentence Type and Time was highly significant only for Group 1, for the contrasts of *It-NTS*, *There-NTS* and *NTS-PVS*, both between the pretest and the posttest and between the pretest and the post-posttest, and for the *There-PVS* contrast only between the pretest and the posttest [$F(3, 93) = 4.57, p < .001^{**}$].

Regarding the 4X3X2 analyses, the analysis where School was a between-subjects factor revealed a significant 2-way interaction between Sentence Type and School, only for Group 2 [$F(3,93) = 3.03, p = .033^*$]. The 3-way interaction between Sentence Type, Time and School was insignificant for both Groups.

The analysis involving Learning Disabilities as a between-subjects factor revealed that the 2-way interaction between Sentence Type and Learning Disabilities was insignificant in either of the Groups. So was the 3-way interaction between Sentence Type, Time and Learning Disabilities.

By-Subjects Analysis by Groups and by Schools

Interactions by Groups and by Schools

Concerning the within-subjects analysis (4X3 design), the interaction between Sentence Type and Time was only significant in Group 1, School 2 [$F(6,78) = 3.95, p = .019^*$]. The assumption of sphericity for the interaction between Sentence Type and Time had been violated ($p = .019^*$), so Greenhouse-Geisser estimates were used. The interaction was significant for the contrasts of *It-There*, *It-PVS*, *It-NTS* and

There-PVS between the pretest and the posttest, and for the *NTS-PVS* contrast both between the pretest and the posttest and between the pretest and the post-posttest.

Regarding the 4X3X2 analysis involving Learning Disabilities as a between-subjects factor, the 2-way interaction between Sentence Type and Learning Disabilities was significant only in Group 2, School 2 [$F(3,51) = 2.94, p = .042^*$]. Moreover, a 3-way interaction between Sentence Type, Time and Learning Disabilities was revealed only for Group 2, School 2 [$F(6,102) = 2.2, p = .049^*$]. Recall that Learning Disabilities had a main effect in the pretest, but not in the posttest or in the post-posttest.

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תקציר

קיימות מספר היפותזות בנוגע למצב התחילי ברכישת שפה שנייה (L2) ובנוגע לתפקיד ה-UG בתהליך הרכישה. המחקר הנוכחי בוחן את התקפות של "היפותזת הגישה המלאה וההעברה המלאה" (Full Access Full Transfer Hypothesis), לפיה, בתחילה, לומדי L2 יורשים את ערכי הפרמטרים מה-L1 שלהם (העברה מלאה), אבל במהלך הרכישה, כאשר הם נתקלים בקלט הרלוונטי ב-L2 (הסותר את ערכי הפרמטר של ה-L1), הלומדים יכולים לקבע מחדש את הערכים הללו, הודות לגישה המלאה שיש להם ל-UG (Schwartz and Sprouse 1994, 1996).

בכדי לבדוק אם העברה וקיבוע מחדש אכן מתרחשים (כלומר, אם ללומד L2 אכן יש גישה ל-UG), ערכתי מחקר המתמקד ב-"פרמטר הנושא הריק" בקרב ילדים דוברי עברית (L1: עברית) הרוכשים אנגלית כשפה שנייה (L2: אנגלית). שתי השפות נבדלות זו מזו בערכיהן לגבי "פרמטר הנושא הריק", כאשר אנגלית איננה שפת נושא ריק בעוד שעברית הינה שפת נושא ריק (חלקית/מעורבת). מכאן שקיבוע מחדש נדרש על מנת לאפשר את תהליך הרכישה. בנוסף, שאפתי לחשוף את השפעתה של עדות חיובית מפורשת של אחת התכונות המשוייכות לפרמטר על קיבועו מחדש לכדי הערך של ה-L2.

106 תלמידי כיתה ו' דוברי עברית, אשר לומדים אנגלית כשפה שנייה, נבחנו על שלוש מהתכונות המשוייכות ל-"פרמטר הנושא הריק": (i) השמטת נושאים פרונומינליים תמטיים (ארגומנטליים); (ii) השמטת נושאים פרונומינליים אקספליטיביים ו-(iii) נושאים פוסט-פעליים (Rizzi 1986). הם נבחנו לראשונה באמצעות מטלת בחירת תרגום מעברית לאנגלית. לאחר מכן, 69 מהמשתתפים הללו חולקו לשתי קבוצות, כאשר שתיהן נחשפו לתכונות של אלמנטים אקספליטיביים (דהיינו, כינויי הגוף *it* ו-*there*). באחת הקבוצות הושם דגש על כינויי הגוף האקספליטיביים הללו באמצעות עדות חיובית מפורשת. שתי הקבוצות נבחנו בשנית מיד לאחר מפגשי הלימוד, תוך שימוש באותה משימה, על מנת להשוות את ביצועי הקבוצה שנחשפה לעדות חיובית מפורשת עם ביצועי הקבוצה שלא נחשפה אליה. 63 מהמשתתפים הללו נבחנו שוב ארבעה חודשים לאחר מפגשי הלימוד, על מנת לגלות שימור (או היעדר שימור) של ידע הנרכש באמצעות עדות חיובית מפורשת.

התוצאות מראות שזמן קצר לאחר מפגשי הלימוד, הקבוצה שנחשפה לעדות חיובית מפורשת השתפרה באופן מובהק בדחיית נושאים אקספליטיביים ריקים ובלתי דקדוקיים במבני מזג אוויר (המצריכים את האקספליטיב *it*), כמו גם בדחיית נושאים

פוסט-פעליים בלתי דקדוקיים (המשתתפים שלטו היטב באקספלטיב *there* במבנים אקזיסטנציאליים עוד לפני מפגשי הלימוד). אולם, בטווח הארוך, השיפור הזה לא נשמר במלואו. בנוגע לתכונה הנוספת המשוייכת ל-"פרמטר הנושא הריק" – דחיית נושאים תמטיים ריקים – לא נרשם שיפור זמן קצר לאחר מפגשי הלימוד, בשתי הקבוצות. השתיים לא הפגינו עלייה מובהקת בדחיית נושאים תמטיים ריקים גם בטווח הארוך. מוצעים הסברים אפשריים לממצא זה.

אוניברסיטת תל-אביב

הפקולטה למדעי הרוח ע"ש לסטר וסאלי אנטין

החוג לבלשנות

פרמטרים (או היעדרם) ברכישת שפה שנייה: פרמטר הנושא הריק

חיבור זה הוגש כעבודת גמר לקראת התואר
"מוסמך אוניברסיטה" - M.A. באוניברסיטת ת"א

על ידי

נועה ברנדל

העבודה הוכנה בהדרכת:

ד"ר אירנה בוטויניק

פרופ' טל סילוני

ספטמבר 2014