“EVERY STUDENT DIDN’T LEARN ENGLISH”
THE ACQUISITION OF SCOPE BY L2 LEARNERS OF ENGLISH

A THESIS SUBMITTED TO
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NAZLINUR GÖKTÜRK

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FOR
THE DEGREE OF MASTER OF ARTS
IN
THE DEPARTMENT OF ENGLISH LANGUAGE TEACHING

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Approval of the Graduate School of Social Sciences

_____

Prof. Dr. Meliha Altunışık
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Arts.

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Assoc. Prof. Dr. Nurten Birlik
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Arts.

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M. A., Department of Foreign Language Education
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Keywords: L2 acquisition of scope; scope ambiguity; universal quantifier; negation; L2 processing of scope

ÖZ

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Keywords: Nicel sözcüklerin ikinci dilde edinimi; nicel sözcüklerden kaynaklanan çok anlamlılık; evrensel niceleyici; olumsuzluk; nicel sözükleri ikinci dilde işlemleme

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DMTH: Developmentally Moderated Transfer Hypothesis

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L1: First Language

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CHAPTER 1

INTRODUCTION

When two (or possibly more) quantifiers such as *every*, *some*, and *all* appear in a construction, the interaction between the quantifiers is widely considered to give rise to scope ambiguity (Horn, 1989; Jackendoff, 1972; May, 1977, 1985). Scope ambiguities also arise when a quantified expression co-occurs with negation in a clause. However, several factors, such as the semantic nature of the quantifier (e.g., universal *versus* existential) and the syntactic position of the quantifier in a clause come into play in the interpretation of statements which give rise to potential scope ambiguity.

In recent years, several studies have been conducted to investigate this phenomenon in the field of second language acquisition (SLA). A number of researchers have examined how second language (L2) learners acquire the knowledge of the properties related to the interpretation of the constructions with quantifiers in their L2 (Chung, 2009, 2012; Ionin, Luchkina & Stoops, 2014; Kwak, 2010; Lee, 2009; Marsden, 2005, 2009). The primary goal of these studies has been to investigate the extent to which adult second language learners can acquire scope interpretations in the target language; whether L2 learners differ from native speakers in their interpretive preferences, and why the differences, if any, emerge between native speakers and adult L2 learners of the target language.

Although there has been a plethora of SLA studies on the acquisition of scope, the acquisition of scope interpretations in L1-Turkish and L2-English has rarely been tested, unlike quantifier scope in languages such as English, Korean,

Japanese, and Chinese. Furthermore, there have been few, if any, experimental investigations undertaken to find out how adult Turkish learners of English interpret sentences containing quantified phrases and negation in the target language. The present thesis addresses this gap and attempts to contribute to our understanding of the acquisition of scope by investigating the acquisition of the interaction between negation and the universal quantifier phrase *every NP* by Turkish adult learners of English. Specifically, the current study aims to find out how adult Turkish learners of English interpret English constructions containing negation and a universal quantifier. Using a cross-sectional experimental design and providing evidence from native speakers of Turkish and English, the present study will shed more light on the acquisition of the scope phenomenon cross-linguistically.

1.1. Scope Facts

1.1.1. English

In English, constructions involving negation and quantifiers like *every*, *each*, *some,* or *four* exhibit scope ambiguity (Horn, 1989; Jackendoff, 1972; May, 1977, 1985). However, a number of factors, such as inherent properties of the quantifier and the syntactic position in which the quantified phrase appears in a clause affect the interpretation of such statements. For instance, a sentence containing negation and a subject universal quantifier phrase like (1) can receive two interpretations.

(1) **Every squirrel** did**n't** pick up nuts.

a. Surface scope reading (*every* > *not*):
   Every squirrel is such that it did not pick up nuts.

b. Inverse scope reading (*not* > *every*):
   Not every squirrel picked up nuts.

Under one interpretation, the subject universal quantifier phrase *every squirrel* takes scope over negation (*every* > *not*) as in (1a), meaning that *every squirrel is such that it did not pick up nuts.* That is, no squirrel picked up any nuts. This interpretation is called *surface scope reading* because it arises from the

structural configuration in which the subject in [Spec TP] c-commands the negation. Under the other interpretation, the subject universal quantifier takes scope below negation (*not* > *every*) as in (1b), which can be paraphrased as *not every squirrel picked up nuts*. That is, not all of the squirrels picked up nuts, which means that some of them may have picked up nuts. This is called *inverse scope reading* as the scope order of the universal quantifier and negation does not align with the order in which they appear in the surface structure of the clause.

In order to explain how the different scope readings are obtained in sentences with doubly quantified expressions, May (1977, 1985) proposes a movement operation called Quantifier Raising (QR). On May's account, c-command relations between two operators at logical form (LF) determine scope relations. Accordingly, QR involves the raising of a quantifier from its original position to a position where it will ultimately c-command the other quantifier at LF. This movement takes place covertly. In this regard, in (1a), the surface scope reading becomes available because at LF, the subject universal quantifier phrase *every squirrel* can be interpreted in its surface position, from where it c-commands negation, whereas in (1b), the subject DP *every squirrel* is interpreted in its original VP-internal position, where negation c-commands the quantifier phrase (QP) *every squirrel* at LF.

By contrast, when the universal QP occupies the object position of a negative clause, the construction has been reported not to give rise to ambiguity (Chung, 2012; Musolino & Lidz, 2006; Musolino, 2006), as illustrated in (2).

(2) Squirrels didn't pick up every nut.

a. Surface scope reading (*not* > *every*):

It is not the case that squirrels picked up every nut.

b. *Inverse scope reading (*every* > *not*):

Every nut is such that it was not picked up by squirrels.

According to Aoun and Li (1993), the blocking effect of negation, which arises due to a locality restriction, prevents the QP in the object position to raise to a position where it can c-command negation. Thus, in the case at hand, the only

available interpretation is surface scope reading (*not* > *every*), in which negation c-commands the QP in the object position. This reading can be paraphrased as *it is not the case that squirrels picked up every nut*. In other words, the construction in (2) does not give rise to the inverse scope reading (*every* > *not*), and thus it cannot mean that *every nut is such that it was not picked up by squirrels*.

One additional factor that may be at work in sentences like (2) is entailment. The interpretation in (2a), which can be paraphrased as *there are some nuts that were not picked up by the squirrels,* is still true under the alternative interpretation in (2b), which means that *no nuts were picked up by squirrels*. The reading *no nuts were picked up by squirrels* entails the reading *there are some nuts that were not picked up by the squirrels.* That is, if the squirrels picked up none of the nuts, it follows that the squirrels picked up not all of the nuts, but not vice versa. Assuming that the scope interpretations are guided by the entailment relations described above, one would anticipate that the inverse scope reading would be easier to detect than the surface scope reading because the proposition *No nuts were picked* entails the proposition *Some nuts were not picked*. Yet, Musolino and Lidz (2003) reported that English native speakers strongly preferred the *not* > *every* interpretation in response to the constructions like (2), in line with the account put forward by Aoun and Li (1993).

Musolino (2006) attributes the native speakers' preference for the *not* > *every* interpretation to a class of conversational inferences called "scalar implicature" (Horn, 1989), which is an elaborated form of Grice's theory of conversation (Grice, 1957, 1989). Within the framework developed by Grice (1957, 1989) regarding the conversational implicature, when people are engaged in a conversation, they are supposed to obey a certain set of rules in order to have a smooth exchange of ideas in discourse. Because speaking is a joint activity, speakers should cooperate with their interlocutors in the conversation. They should provide as much information as the conversation demands; not too much, not too little. Moreover, they should make their point relevant to the purposes of the conversation. Lastly, they are expected to avoid obscurity and to take their interlocutor's background knowledge into consideration

when they convey their utterances. For instance, when a speaker utters an expression such as *some* in a conversation, the hearer will presume that the speaker has chosen not to utter an informationally stronger expression like *all* because s/he is not able to provide adequate evidence for the stronger expression.

In this respect, let us consider the statement in (2). During the interpretation of the statement *squirrels didn't pick up every nut,* listeners will entertain only the *not > every* interpretation given in (2a) since they assume that a stronger expression such as *squirrels picked up none of the nuts* would be more appropriate to use so as to convey the "none" meaning instead of an informationally weaker expression such as *squirrels didn't pick up every nut*.

To sum up, different types of knowledge from a variety of domains such as syntax, semantics, and pragmatics may have a role to play in the interpretation of constructions such as (1) and (2) in English. Based on the relations of entailment, a statement like (2) is expected to be interpreted as in (2b), the reading which is always true, whereas on syntactic and pragmatic accounts the same statement is expected to be interpreted as in (2a) (Chung, 2012; Musolino, 2006). The comprehension of scopally ambiguous statements like (1) and (2) requires the interplay of three kinds of knowledge from different sources: 1) the knowledge of c-command relations and QR, 2) the knowledge of entailment relations, 3) the knowledge of conversational implicature. Put it differently, the interpretation of constructions involving negation and universally quantified phrases in English seems to represent an interface phenomenon taking place between syntax, semantic, and pragmatics.

1.1.2. Turkish

1.1.2.1.Introductory Facts

Turkish is an agglutinative language which exhibits the features of a canonical SOV language (Erguvanlı, 1984; Kural, 1993). In Turkish, there are three ways of expressing sentential negation: verbal negation suffix (*-mA*), nominal negation (*değil*), and existential negation (*yok*). In my thesis, I am interested in the

interaction between a verbal negation suffix (*-mA*) and a universal quantifier. The verbal negation (*-mA*) attaches to the verb stem as in (3).

(3) Mehmet arkadaş-ı-nı ara-**ma**-dı.
Mehmet friend-POSS-ACC call-NEG-PAST-3sg
'Mehmet didn't call his friend.'

When the stem involves an aspectual modal and tense markers like in (3), the negation suffix (*-mA*) is expressed first. However, when the stem involves markers of causatives, reflexives, passives or reciprocals, the negation suffix (*-mA*) follows the relevant markers. An example involving a passive morpheme is given in (4).

(4) Bardak-lar kır-ıl-ma-dı.
glass-PL friend-POSS-ACC
'Glasses weren't broken.'

1.1.2.2.Turkish Scope

In Turkish, several factors such as the linear position of quantifier phrases, c-command relations, and the lexical nature of quantified expressions affect the interpretation of constructions involving quantifiers (Butler, 2002; Kural, 1994; Göksel & Özsoy, 2003, Kelepir, 2001; Kennelly, 2003; Zidani-Eroğlu, 1997; Aygen, 1999). With regard to the interpretation of negative statements containing quantified expressions in the preverbal field such as (5), Turkish is considered to exhibit scope rigidity (Kelepir, 2001; Özyıldız, to appear; McKenzie, 2006). For example, a statement involving negation and a universally quantified noun phrase in the pre-verbal area like (5) can receive only one reading (Kelepir, 2001).

(5) Her kedi süt içmedi.
every cat milk drink-NEG-PAST
'Every cat didn't drink milk.'

a. √ Inverse scope interpretation (*neg* > *every*)

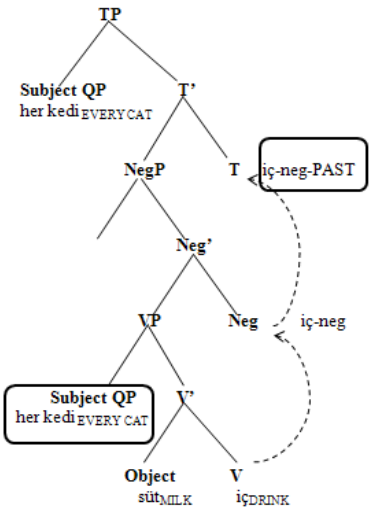
It is not the case that every cat drank milk.

b. *Surface scope interpretation (*every* > *neg*)

Every cat is such that it didn't drink milk.

The universally quantified subject *her kedi* can only be interpreted within the scope of negation (*not* > *every)* as in (5a), which can be paraphrased as *it is not the case that every cat drank milk*. That is, not all of the cats drank milk, which means that some of them may have drunk milk. In this thesis, I will refer to the interpretation in (5a) as *inverse scope reading* because in this reading I assume that in Turkish, just like in English, the subject on the surface occupies the [Spec TP] position from which it c-commands the negation, and that the inverse scope reading is obtained through the reconstruction of the subject into its original [Spec VP] position (for a detailed explanation see Öztürk, 2004).

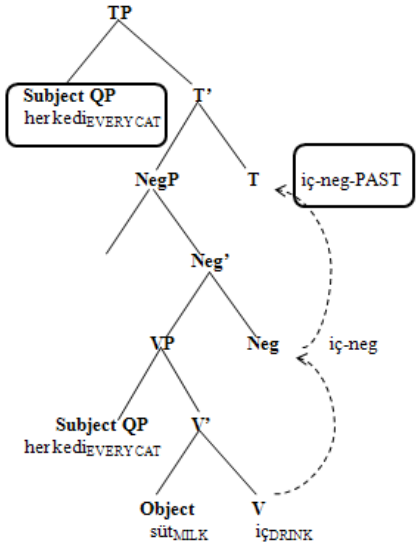
(6) a. Inverse Scope Reading (*neg* > *every)*



The universally quantified subject *her kedi* cannot be interpreted outside the scope of the negation (*every* > *neg)* as in (5b), and thus the statement in (5) cannot mean that *every cat is such that it didn't drink milk*. I will refer to the reading in (5b) (unattested in Turkish) as the *surface scope reading* since on that reading, the

universally quantified subject presumably c-commands negation without any covert movements, as shown in (6b).

(6) b. *Surface Scope Reading (*every* > *neg)*



Likewise, when the universally quantified phrase occupies the object position of a negative clause and appears in the pre-verbal field, the construction allows only one interpretation, as in (7) (Kelepir, 2001).

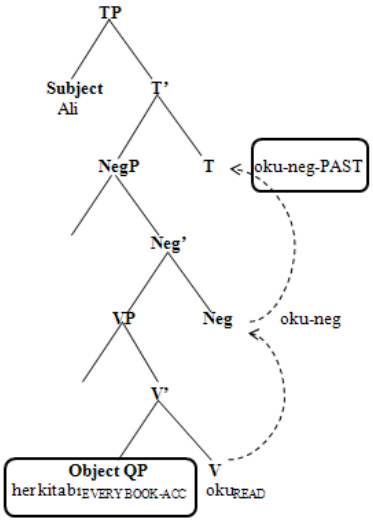
(7) Ali her kitabı okumadı.
Ali every book-ACC read-NEG-PAST
'Ali didn't read every book.'

a. √ Surface scope interpretation (*neg* > *every*)
It is not the case that Ali read every book.

b. *Inverse scope interpretation (*every* > *neg*)
Every book is such that it was not read by Ali.

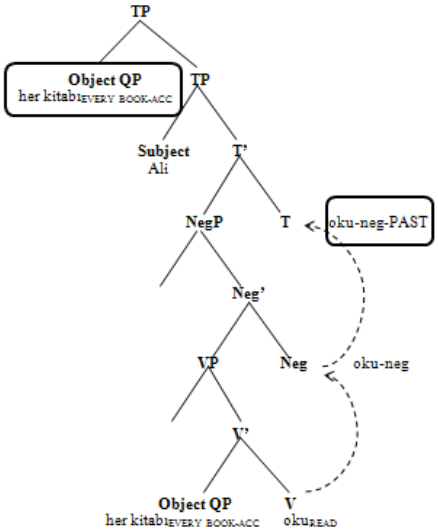
The object universal quantifier phrase *her kitabı* can only be interpreted under the scope of negation (*neg* > *every*), as in (7a), meaning that *not every book was read by Ali.* I will refer to the reading in (7a) as *surface scope reading* because negation c-commands the quantifier phrase in the object position without any movements, as shown in (8a).

(8) a. Surface Scope Reading *(neg > every)*



However, the universally quantified object NP *her kitabı* cannot take scope over negation (*every > neg*), as in (7b), and thus the statement in (7) cannot mean that *every book is such that it was not read by Ali* (that is, none of the books was read by Ali). This reading, which is unattested in Turkish, will be called *inverse scope reading*. For this reading to obtain, the universally quantified object should undergo QR in order to c-command negation, as illustrated in (8b).

(8) b. *Inverse Scope Reading (*every > neg)*



In brief, in Turkish, when a universally quantified phrase appears in the subject position of a negative clause, the statement allows only the inverse scope reading (*neg* > *every*). On the other hand, when a universally quantified expression occupies the object position of a clause and interacts with verbal negation, the sentence allows only the surface scope reading (*neg* > *every*). In either case, the statements in question do not give rise to ambiguity.

Few studies have been conducted to investigate how native speakers of Turkish interpret statements involving quantifiers and negation. As there is a lack of empirical research on scope judgments of Turkish native speakers, in this thesis I will examine the interpretation of constructions containing verbal negation and universal quantifier phrase in either subject or object position by Turkish native speakers to set the baseline against which the judgments made by Turkish L2 learners of English will be compared.

The assumption that the subject c-commands the negation in both Turkish and English allows me to describe the scope readings in the two languages by giving them the same names. Namely, when the QP is in the subject position, the reading in which negation takes scope over *every* is referred to as *inverse scope reading*, and the reading in which *every* takes scope over negation is called *surface scope reading.* Similarly, when the QP is in the object position, the reading in which negation takes scope over *every* is called surface scope reading, and the reading in which *every* takes scope over negation is referred to as inverse scope reading.

The comparison of Turkish and English scope facts indicates that Turkish and English behave similarly with respect to the interpretations allowed for the constructions containing negation and a QP in the object position, whereas they differ from each other in the interpretations of the constructions with negation and a QP in the subject position. That is, when a universally quantified expression appears in the object position, the surface scope reading (*neg* > *every)* is preferred in both languages. By contrast, when a universally quantified phrase is in the subject

position, Turkish allows only the inverse scope reading (*neg > every),* whereas English allows both the surface scope (*every > neg)* and the inverse scope reading (*neg > every).*

1.2. Research Questions

The research questions addressed in this study are the following:

1) How do adult Turkish learners of English interpret scopally ambiguous statements involving a universally quantified phrase and negation in English?

2) To what extent do adult Turkish learners of English transfer their L1 interpretation of statements containing a universal quantifier and negation to their L2 English counterparts?

- Are there any differences in the L2 learners' interpretations of sentences with a universal quantifier and negation across different proficiency levels (i.e., low-intermediate and low-advanced)?

1.3. Theoretical Background

In this study, the Full Transfer/Full Access Hypothesis (Schwartz & Sprouse, 1996) and the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987) will be adopted to formulate hypothesis regarding the L2 learners' interpretations of construction involving negation and a universal quantifier in the subject or object position in the target language.

1.3.1. Full Transfer/Full Access Hypothesis

According to the Full Transfer/Full Access Hypothesis, the L1 grammar constitutes the initial state of the second language grammar (Schwartz & Sprouse, 1996). Thus, at the onset of L2 acquisition, the learners transfer their L1 grammar in its entirety to their L2. When the existing L1 grammar fails to accommodate the L2 input, restructuring of the interlanguage grammar takes place without altering the structure of the mother tongue (White, 2003). Therefore, L2 input motivates the

modifications in the interlanguage grammar. In addition, it is highlighted that L2 development is constrained by Universal Grammar (UG). That is, all the hypotheses that the learners formulate in the target language fall within the limits of UG. Although it is maintained that the increase in the exposure to L2 input enables the L2 learners to construct more native-like hypothesis, there is no guarantee that they will reach fully native-like competence. L2 learners may fail to exhibit performance identical to that of native speakers because the interlanguage hosts two grammars and the interaction between the properties of the native and target language grammars may lead to non-native-like analyses of the input.

1.3.2. The Subset Principle

As a principle of learning, the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987) postulates that when L1 and L2 learners face a learning situation that is captured by two possible generalizations in the grammar, they start with the most restrictive grammar which is compatible with the input. On this account, the initially adopted grammar constitutes a proper subset of the alternative grammar. During the course of acquisition, the learners extend their existing grammar based on positive evidence. In other words, they move from a more restrictive grammar, which is called the *subset grammar*, to a less restrictive grammar, which is called the *superset grammar*, as they become exposed to the target language. The Subset Principle holds that the learners' expansion of their current grammar through positive evidence is possible and does not cause any learnability problems, while the reverse is impossible. That is, the learners cannot contract their current grammar; they cannot move from a superset grammar to a subset grammar because the contraction of grammar would require negative evidence. However, negative evidence is not available to the learner. The learners' restriction of grammar from a superset value to a subset value constitutes a learnability problem (Baker, 1979) because in such a case, the learner is supposed to determine the grammaticality of the structures in the absence of positive evidence,

which contrasts with the commonly held belief that language learning takes place through positive evidence.

As mentioned above, the target languages in the present study, Turkish and English, seem to be in a subset-superset relationship with regard to the interpretations that they allow for the constructions involving negation and a subject quantifier phrase such as (9). Examples like (9) are ambiguous in English, as indicated below.

(9) **Every** squirrel did**n't** pick up nuts.

a. Surface scope reading (*every* > *not*)
   Every squirrel is such that it did not pick up nuts.

b. Inverse scope reading (*not* > *every*)
   Not every squirrel picked up nuts.

The Turkish counterparts of those statements, however, can only be interpreted in the inverse scope reading, as shown in (10).

(10) Her kedi süt içmedi.
every cat milk drink-NEG-PAST
'Every cat didn't drink milk.'

a. Inverse scope interpretation (*neg* > *every*)
   It is not the case that every cat drank milk.

b. *Surface scope interpretation (*every* > *neg*)
   Every cat is such that it didn't drink milk.

Because Turkish is a subset of English with respect to the interpretation of the constructions containing negation and a subject QP, Turkish learners of English need to have positive evidence so as to extend their current grammar and to add an extra interpretation, which is the surface scope reading, to their grammar.

On the other hand, when the universal quantifier appears in the object position, as in (11) and (12), Turkish and English are identical with each other in that both languages allow only for the surface scope interpretation.

(11) Squirrels didn't pick up every nut.

a. √ Surface scope (not > every):

It is not the case that squirrels picked up every nut.

b. *Inverse scope (every > not):

Every nut is such that it was not picked up by squirrels.

(12) Ali her kitabı okumadı.

Ali every book-ACC read-NEG-PAST

'Ali didn't read every book.'

a. √ Surface scope interpretation (*neg* > *every*)

It is not the case that Ali read every book.

b. *Inverse scope interpretation (*every* > *neg*)

Every book is such that it was not read by Ali.

Because the two languages are not different from each other regarding the interpretations of the target constructions, Turkish learners of English would be expected to behave like native English speakers in their scope judgments.

1.4. Hypotheses

In accordance with the Full Transfer/Full Access Hypothesis (Schwartz & Sprouse, 1996), I expect that for sentences involving negation and a universally quantified expression in the subject position, such as (13), the lower proficiency L2 learners of English will assume that English behaves likes Turkish with respect to scope interpretations and permit only (13b). However, following the predictions of the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987), I expect that there will be a gradual development in L2 learners' interpretation of sentences with negation and a universal quantifier towards the native-like interpretations. Thus, I predict that more proficient L2 learners of English will expand their grammar as it is exemplified in the L2 input and allow the interpretation in (13a), although it is not present in L1.

(13) **Every** squirrel did**n't** pick up nuts.

a. Surface scope (*every* > *not*):

Every squirrel is such that it did not pick up nuts.

b. Inverse scope (*not* > *every*):

Not every squirrel picked up nuts.

For constructions involving negation and a universally quantified expression in the object position such as (14), I expect no significant differences in scope interpretations between English native speakers and L1 Turkish-L2 English learners in either L2 group since English and Turkish are similar in terms of the scope interpretations of sentences like (14), that is, in both languages surface scope interpretation, exemplified in (14a), is preferred.

(14) Squirrels didn't pick up every nut.

a. Surface scope (*not* > *every*):

It is not the case that squirrels picked up every nut.

b. *Inverse scope (*every* > *not*):

Every nut is such that it was not picked up by squirrels.

In order to test the two hypothesis, I designed an offline questionnaire and an online self-paced reading study in which I tested the interpretation of sentences like (13) and (14) by native speakers of English and Turkish, as well as by low-intermediate and low-advanced Turkish learners of English.

For constructions with negation and a universally quantified subject, the results of the offline study indicated that Turkish speakers exhibited a preference for the inverse scope reading (*not* > *every*) in their judgments of the target constructions in Turkish. By contrast, English speakers preferred the surface scope reading (*every* > *not*) for comparable examples in English. Within the L2 learner group, the low-advanced L2 learners differed from the native speakers of English in their judgments. That is, unlike the native English speakers, who preferred the surface scope reading, the L2 learners with low-advanced proficiency strongly preferred the inverse scope

reading of the target constructions. By contrast, the low-intermediate L2 learners seemed to show native-like preferences in their interpretations of the target statements.

For constructions containing negation and a universally quantified object, both Turkish and English native speakers were found to have a preference for the surface scope reading (*not* > *every*). Likewise, both the low-intermediate and the low-advanced L2 learners displayed a preference for the surface scope interpretation.

The findings of the on-line study revealed that the native English speakers took longer to assign the inverse scope interpretation to the target constructions involving negation and a subject universal quantifier phrase. The low-advanced L2 learners also exhibited native-like behavior in their processing of the target statements. Namely, they produced longer reading times for the inverse scope reading than for the surface scope reading. By contrast, the low-intermediate L2 learners were found to be non-native-like in their processing of the target constructions. That is, they processed both the surface scope and the inverse scope interpretations at a similar pace.

When processing the target statements containing negation and an object universal quantifier phrase, the English native speakers were found to demonstrate longer reading times for the inverse scope reading of the target statements than for their surface scope reading. The low-advanced L2 learners behaved like native speakers, whereas the low-intermediate L2 learners manifested non-native-like behavior in the processing of the target constructions. That is, similar to the native English speakers, the low-advanced learners took longer to assign the inverse scope interpretation to the target structures than the surface scope interpretation. By contrast, the L2 learners with low proficiency demonstrated no difference in their reading times between the surface scope and the inverse scope readings.

CHAPTER 2

REVIEW OF LITERATURE

2.1. L1 Acquisition and Processing of Scope

Over the past two decades, there has been a vast amount of research conducted on how children comprehend statements involving quantified phrases and negation in the field of first language (L1) acquisition (Musolino, 1998; Krämer, 2000; Musolino, Crain & Thornton, 2000; Lidz & Musolino, 2002; Gualmini, 2003; Musolino & Lidz, 2003; Su, 2003/2008; Musolino, 2004; Musolino & Lidz, 2006; Özçelik, 2008; Zhou & Crain, 2009; Conroy, Lidz & Musolino, 2009) The focus of these studies has been on the language development of children regarding their interpretation of sentences with scope ambiguity; whether or not children differ from adults in their assignments of scope interpretations, and what can account for the emerging differences. For instance, in his pioneering study on the acquisition of the interaction between negation and quantifiers, Musolino (1998) investigated how L1 English children acquire the relevant interpretations of constructions including quantified phrases and negation. In order to test children's comprehension of sentences with quantified phrases and negation such as "Every horse didn't jump over the fence", he designed five experiments measuring children's semantic knowledge of constructions involving either a subject or object universal quantifier, as in (15) and (16), the existential quantifier *some* appearing in either the subject or object position, as in (17) and (18), and finally, the numerical quantifier *two* in the object position, as in (19).

(15) "Every horse didn't jump over the fence. ∀ subject, ¬

(16) The students didn't solve every problem. ∀ object, ¬

(17) Some students didn't solve the problem. ∃ subject, ¬

(18) The detective didn't find someone. ∃ object, ¬

(19) Cookie Monster didn't eat two slices of pizza." ¬, two object

(Musolino, 1998, p. 134)

In the experiments, the Truth Value Judgment Task (TVJT) was utilized. The participants were 20 L1 English children with an age range of 3 to 6. The main finding of the experiments is that English-speaking 5-year-olds exhibit different interpretative preferences from those of adults. In particular, children displayed non-adult-like interpretation for sentences like (15), (18), and (19). That is, they were unable to access inverse scope readings in their interpretation of statements such as (15) and (19) and they inaccurately interpreted statements like (18) on the surface scope reading. Yet, it was noted that the interpretive differences between children and adults were systematic, which led the researcher to put forward the Observation of Isomorphism (Musolino, 1998). According to the Observation of Isomorphism, children, as opposed to adults, "map overt syntactic relations between quantified noun phrases and negation and their relevant semantic interpretation isomorphically." (p.174) Pertaining to the way children's system of interpretation converges onto that of adults, Musolino (1998), drawing on the Semantic Subset Principle (Crain, Ni & Conway, 1994), which postulates that in the presence of two alternative meanings children will initially choose the meaning compatible with the most restrictive set of situations, claims that children are sensitive to the learnability considerations and thus initially form a more constrained set of hypotheses. As they are exposed to positive evidence, they expand their initial hypotheses and become more adult-like in creating hypotheses. Therefore, the availability of positive evidence provides children with an opportunity to adjust their current system of interpretation to the adult interpretation system. Musolino (1998) concludes that the divergent patterns emerging in the children's scope interpretation does not cause a learnability problem, and that the Universal Grammar is operative in the acquisition of semantic knowledge.

Expanding upon Musolino's (1998) Observation of Isomorphism, which maintains that children's interpretation of sentences with scope ambiguity rests on the overt syntactic relations, Musolino, Crain and Thornton (2000) further explored children's understanding of semantic interactions between QPs and negation. They carried out three experiments using TVJT with the purpose of investigating children's comprehension of constructions with negation and quantifiers.

In the first experiment, they examined if children would (inaccurately) assign an isomorphic interpretation (i.e., *not > some)* to the constructions such as (20).

(20) "The detective didn't find someone/some guys."

(Musolino, Crain & Thornton, 2000, p. 9)

The researchers designed an experimental situation which made available both scope interpretations of the statements such as (20) (i.e., narrow and wide scope of the indefinite); however, the stories presented in the task made the target sentences false on the narrow scope reading of the indefinite and true on the wide scope reading. Two groups of children participated in the study. The first group was made up of children with an age range of 3 to 5, while the second group included children ranging in age 5 to 6. A control group of adults was also tested through the video recordings of the stories employed in the groups of children. The results indicated that there was a steady increase with age in the proportion of the participants' accepting sentences like (20) on the wide scope reading of the indefinite. In other words, younger children favored the isomorphic interpretation when interpreting sentences like (20), whereas adults and some of the older children appropriately assigned such sentences a non-isomorphic interpretation.

The second experiment investigated whether or not children have access to the non-isomorphic interpretation (*not > every*) of sentences like (21). The research strategy used in the first experiment was also employed in this experiment. That is, the stories presented in the task were developed in such a way that they were compatible with both of the scope interpretations, but were true on the non-isomorphic reading (*not > every*) and false on the isomorphic reading (*every > not*).

(21) “Every horse didn’t jump over the fence.”

(Musolino, Crain & Thornton, 2000, p. 11)

Twenty L1 English children and a group of adults serving as a control group took place in this study. The findings revealed that children judged statements like (21) true less than 10% of the time on the non-isomorphic interpretation, whereas the adults in the control group always identified those statements as true.

In the third experiment, Musolino et al. (2000) aimed to find out whether or not children would interpret statements like (22) as having the *not* > *every* reading.

(22) “The Smurf didn’t buy every orange.”

(Musolino, Crain & Thornton, 2000, p. 13)

The participants were 20 L1 English children aged between 3 and 6. In this experiment, the contexts were constructed in a way that the target sentences were false on the wide scope reading, but true on the narrow scope reading. It was found out that children judged sentences like (22) on the *not* > *every* interpretation as true more than 75% of the time. Thus, Musolino, Crain and Thornton (2000) ascertained that children accurately assigned a *not* > *every* reading to sentences like “The smurf didn’t buy every orange”, while they fail to assign such a reading to sentences like “Every horse didn’t jump over the fence”. Such a finding guided the researchers to formulate the Observation of Isomorphism which postulates that “unlike adults, young children systematically interpret negation and quantified noun phrases on the basis of their position in overt syntax” (Musolino, Crain & Thornton, 2000, p. 14).

Accordingly, only surface scope reading is accessible to children in the interpretation of constructions that adults can assign not only surface but also inverse scope readings without any difficulty. Musolino, Crain and Thornton (2000) state that children’s failure to assign the *not* > *every* interpretation to sentences like “Every horse didn’t jump over the fence” does not effectuate a problem of learnability as children simply need to *add* another interpretation to their existing repertoire of the interpretations. However, in the interpretation of statements like “The detective didn’t find someone”, children need to not only learn that this type of

sentences *can* allow for a non-isomorphic interpretation, but also get rid of the isomorphic interpretation as such sentences do not receive isomorphic interpretations. Following Musolino (1998), the researchers propose that positive evidence compels the children to discard the previously made hypothesis regarding the interpretation of *some* within the scope of negation from their grammar and guides them to interpret *some* in such a way that *some* takes scope over negation, as in the adult interpretation system. In an effort to resolve the learnability problem, they assert that in order to revise their inaccurate hypothesis, it is sufficient for children to acquire the knowledge that *some* and *any* are allomorphs (different forms of a single morpheme) and that they can appear in mutually exclusive contexts.

In contrast to Musolino's (1998) and Musolino, Crain and Thornton's (2000) claims, a number of studies have revealed that in their assignment of scope interpretations, children do not consistently favor the reading aligned with the overt syntactic form (Krämer, 2000; Musolino & Gualmini, 2004; Gualmini, 2004; Su, 2008; Zhou & Crain, 2009). To illustrate, in Krämer (2000), the author, who studied the interpretation of sentences like (23) by Dutch-speaking children, found that Dutch-speaking children prefer the non-isomorphic reading of sentences involving indefinite noun phrases and negation. In Dutch, the position of an indefinite NP may be either on the right or left of negation, which determines the interpretation(s) that a sentence can receive. In cases where the indefinite noun phrase occupies a position on the right of negation in a clause such as (23a), only the *not* > *a* interpretation is allowed, whereas in cases where the indefinite noun phrase (NP) is on the left of negation like (23b), the only interpretation that is allowed is the *a* > *not* reading.

(23) a. "De jongen heeft geen vis gevangen.
the boy has no fish caught
The boy did not catch any fish.' (*not* > *a* reading)"

b. "De Jongen heft een vis niet gevangen.
the boy has a fish not caught

'The boy did not catch a (particular) fish.' (*a > not* reading)"

(Kramer, 2000, p.82)

Employing TVJT, Krämer investigated the scope interpretations of 50 children with an age range of 4 to 7 and 10 adults in a control group. In the experiment, target statements were presented along with situations in two conditions. In the first condition, the statements such as (23a) were presented as target statements, and in the second condition, the statements like (23b) were given as target statements. The situations devised made the target statements in the first condition false, while they made the target statements in the second condition true. The findings indicated that children always showed a strong tendency to attach the *not* > *a* reading to sentences with indefinite NPs appearing on the right of negation as in (23a), which parallels adults' interpretive preferences. However, when interpreting sentences containing indefinite NPs on the left of negation such as (23b), children differed considerably from adults in their interpretations. Namely, they construed the target sentences such as (23b) on the *not* > *a* reading, which is the non-isomorphic reading, significantly more frequently than the *a* > *not* reading, which is the isomorphic reading. Krämer points out that the reliance of overt syntactic relations cannot explain the results obtained in the study as the children did not favor the isomorphic reading. The researcher maintains that children's non-adult-like interpretive preferences in sentences like (23b) may stem from their lack of ability to incorporate discourse-related information necessary for assigning the *a* > *not* reading. Given the fact in native Dutch the speakers are primarily driven by pragmatics in their assignment of the *a* > *not* reading, Krämer claims that the children may have not yet been capable of integrating the discourse-related information into their syntactic computations of scope interpretations, which, in turn, leads them to differ from the adult native speakers in their scope interpretations. Krämer puts forward that children can access the narrow scope interpretation of the indefinite NPs at relatively earlier stages than the wide scope interpretation of the indefinite NPs because the access to the wide scope reading of the indefinite NPs

involves the integration of information from syntax, semantics and pragmatics, which may pose a challenge to the children.

In addition to Krämer (2000), Gualmini (2004) showed that the initial scope interpretation available to children is not merely the overt syntactic scope, but both surface and inverse scope. Gualmini (2004) examined children with L1 English on their interpretations of structures with indefinite noun phrases and negation. Considering the fact that negative statements are felicitous to use when they indicate a mismatch between what was supposed to happen and what happened in reality (De Villiers & Tager Flusberg, 1975, Wason, 1972), Gualmini (2004) posits that the researchers should include the felicity conditions in their experimental designs to capture an accurate description of children's linguistic knowledge. For concreteness, let us consider the statements in (24).

(24) "I didn't drive to work."

(De Villiers & Tager Flusberg, 1975, p. 279)

The statement in (24) "is more plausible, and consequently easier to comprehend, if it is made by someone who normally drives rather than by someone who commutes by train" (De Villiers & Tager Flusberg, 1975, p. 279). With this fact in mind, Gualmini (2004) created an experiment using TVJT. Below is the experimental design in conjunction with a sample item.

(25) "This is a story about a firefighter who is going to play hide and seek with four dwarves. While the firefighter counts, the dwarves look for a spot to hide. When the firefighter has finished counting, he starts looking for the dwarves. Initially, the firefighter cannot find any of the dwarves and he is ready to give up, but then he decides to try harder. He finds one dwarf who was hiding behind a barrel and he asks the dwarf: 'Ok, am I done now?' and the dwarf says: 'No! There's three more dwarves for you to find.' The firefighter spots a second dwarf who was hiding inside the barrel, and he asks him: 'Ok, am I done now?' but the dwarf says: 'No! There's two more dwarves for you to find.' The firefighter starts looking again, but then he

says: ‘You know guys, those two dwarves did a very good job, I cannot find them. I must give up.’”

(Gualmini, 2004, p. 973)

After being presented with the story, one group of children was instructed to assess the statement in (25a) and the children in the other group were asked to judge the sentence in (25b).

(25a) “This was a story about a firefighter playing hide and seek with four dwarves and I know what happened. The firefighter didn’t find some dwarves.”

(25b) “This was a story about a firefighter playing hide and seek with four dwarves and I know what happened. The firefighter didn’t miss some dwarves.”

(Gualmini, 2004, p.973)

The target statements in (25a) and (25b) are parallel to each other in terms of their truth values as the context in which they are presented is flexible enough to make both of the statements true. Specifically, (25a) is true because “there are two dwarves that the firefighter did not find”, and (25b) is true because “there are two dwarves that the firefighter did not miss” (Gualmini, 2004, p. 973). However, the two statements differ from each other in terms of their felicity. The story builds the expectation that all the dwarves would be found by the firefighter, which makes (25a) felicitous because it conveys a mismatch between the action taking place in reality and the expectations. In contrast, (25b) is infelicitous because it does not express a mismatch between the action taking place in reality and the expectations. Thirty children divided into two groups and 36 adult native speakers of English took part in the experiment. The findings showed that children accepted sentence like (25a) almost 100% of the time, whereas they accepted sentences like (25b) half of the time. As for the adult subjects, it was found that they accepted statements like (25a) 77% of the time, while they accepted statements like (25b) 48% of the time. Gualmini (2004) concludes that four-year-old children have the knowledge of

features relevant to the interpretation of the existential quantifier *some*, and overt syntactic scope does not determine the children's interpretation of constructions with existential quantifier *some* and negation, contrary to the findings of Musolino (1998), Musolino et al. (2000). To put it differently, children with L1 English are able to access not only the surface scope interpretation, but also the inverse scope interpretation of statements when the felicity requirements of negative statements are fulfilled. Therefore, Gualmini (2004) concludes that the discrepancy between his findings and the findings of the research undertaken by Musolino (1998) and Musolino et al. (2000) arises from the children's inability to accommodate infelicitous experimental conditions.

Likewise, Zhou and Crain (2009) tested the comprehension of sentences involving the universal quantifier *every* and negation by children and adults with L1 Mandarin. Unlike their English counterparts, Mandarin statements like (26) and (27) only allow surface scope interpretation.

(26) "Mei-pi ma dou meiyou tiaoguo liba.
every-CL horse all not-have jump-over fence
'It was every horse that didn't jump over the fence.'
Logical form: $\exists x$ [horse' (x) $\wedge$ $\neg$ jumped over the fence' (x)] $\wedge$
$\forall x$ [horse' (x) $\rightarrow$ $\neg$ jumped over the fence' (x)]"

(27) "Bushi mei-pi ma dou tiaoguo-le liba.
not-be every-CL horse all jump-over-ASP fence
'It wasn't every horse that jumped over the fence.'
Logical form: $\exists x$ [horse' (x) $\wedge$ jumped over the fence' (x)] $\wedge$
$\neg$ $\forall x$ [horse' (x) $\rightarrow$ jumped over the fence' (x)]"

(Zhou & Crain, 2009, p. 977)

The researchers designed two experiments. In the first experiment, utilizing the TVJT technique, they tested 20 L1 Mandarin children ranging at the age from 3 to 5 and 20 L1 Mandarin adults as a control group. The children were divided into two groups based on their ages. In one group, the children's mean age was 3.4, while

in the other one it was 5.11. The experimental items in the test were presented with scenarios favoring either the *every > not* reading or not > every reading. Besides, they were preceded by a positive introductory statement in order to satisfy the Condition of Plausible Dissent (Crain et al., 1996), which states that "perception only gives rise to a negative judgment when the correlative positive judgment has already been made or considered" (Russell, 1948, p.138). This is illustrated in (28).

(28) Scenario:

"Three girls had a bad cold. They were going to take some pills. But when they saw the pills, they didn't want to eat them, because they thought the pills would taste bad. So they decided to eat an ice cream first. After eating the ice cream, they still didn't want to eat the pills. Finally they decided to take a nap instead of taking the pills."

Target Sentence:

"Mei-ge	nühai	dou	chi-le	bingjiling,
every-CL	girl	all	eat-ASP	ice cream

danshi	mei-ge	nühai	dou	Meiyou	chi	yao.
but	every-CL	girl	all	not	eat	pill

'Every girl ate an ice cream, but every girl didn't take pills.'"

(Zhou & Crain, 2009, p.981)

The findings revealed that younger L1 Mandarin children showed a tendency to accept statements with a universal quantifier and negation on surface and inverse scope readings, which is in line with the scope interpretations attested in L1 English children (Gualmini, 2004; Musolino & Lidz, 2006). On the other hand, older L1 Mandarin children and adults performed similarly in that they both demonstrated a tendency to accept the statements presented in surface scope contexts, rather than those presented in inverse scope contexts.

In the second experiment, using Felicity Judgment Task, Zhou and Crain examined children's computation of conversational implicature in cases where the alternative descriptions of the stories are provided. Felicity Judgment Task is an

experimental technique designed by Chierchia, Crain, Guasti, Gualmini and Meroni (2001). In this task, the respondents are presented with two alternative descriptions of a scenario and are asked to choose the target statement which describes the scenario better. One of the target statements includes a pragmatically "weaker" term, while the other one involves a pragmatically "stronger" term.

In the experiment conducted by Zhou and Crain (2009), both the *'every ... not'* and the *'not ... every'* sentences were presented in a context favoring the *every* > *not* reading (the 'none' context). As an illustration, one of the stories along with the experimental items is given below.

(29) "…a story about three cats who were going to buy some fish and biscuits for lunch. They all bought some biscuits, but none of them bought fish, because the fish were not as fresh as they had expected."

(Zhou and Crain, 2009, p.985)

After the children were provided with the story, two puppets uttered statements like (29a) and (29b).

(29a) "Mei-zhi xiaomao dou mai-le binggan,
every-CL cat all buy-ASP biscuit
danshi mei-zhi xiaomao dou meiyou mai yu.
but every-CL cat all not buy fish
'Every cat bough biscuits, but every cat didn't buy fish.'

(29b) Mei-zhi xiaomao dou mai-le binggan
every-CL cat all buy-ASP biscuit
danshi bushi mei-zhi xiaomao dou mai-le yu.
but not-be every-CL cat all buy-ASP fish
'Every cat bought biscuits, but not every cat bought fish.'"

(Zhou and Crain, 2009, p.985)

Nine Mandarin-speaking children were tested in the experiment. The findings revealed that all 9 children found both of the statements uttered by the puppets acceptable in the description of the context given. When children were asked to

determine which of the statements sounded better, 8 of them preferred the 'every … not' statements, suggesting that children can compute pragmatic calculations when the alternative interpretations are presented overtly. Zhou and Crain (2009) provide two conclusions for these findings. First, based on the finding that older Mandarin-speaking children and adults behave similarly in their scope interpretations, they state that L1 Mandarin children resemble their English-speaking counterparts in their sensitivity to scalar implicature. Second, they point out that younger Mandarin-speaking children's assignment of scope interpretations are different from that of adults in that children attach both surface scope and inverse scope reading to the sentences comprising a universal quantifier phrase and negation. They propose that in the initial stages, children display a flexible interpretive behavior in their scope assignments and as their grammar matures, they narrow down their interpretations to those of the native language using observable properties of the language, which echoes the proposal put forward by Musolino et al. (2000).

Gualmini (2004), Musolino and Lidz (2006), and Zhou and Crain (2009) asserted that children's assignment of surface scope reading in the absence of contextual information is due to their immature knowledge of pragmatics. Pouscoulous, Noveck, Politzer and Bastide (2007), on the other hand, argue that children's inability to easily compute conversational implicature does not emanate from their incomplete pragmatic knowledge. Instead, it arises from the high processing cost incurred in the evaluation of multiple interpretations of a sentence due to the fact that children's cognitive resources are limited. In their study, the researchers examined how linguistic and task related processing demands affect young children's computation of scalar implicature. The main finding of the study is that simplifying the task features along with its linguistic material enabled the children from all age groups (i.e., 4-, 5-, and 7-year-olds, as well as adults) to give more pragmatic responses. Put it differently, increased complexity in a task affects children's processing of scalar implicature in a negative way because they lack sufficient cognitive resources to override the task demands.

Another alternative account pertaining to children's assignment of interpretations to scopally ambiguous sentences was proposed by Özçelik (2008), who examined English-speaking children's interpretation of statements involving quantification and negation such as (30). According to Özçelik (2008), children can only access interpretations that they consider as most "relevant" in a given situation.

(30) "Donald didn't find two guys.

a. It is not the case that Donald found two guys. (*not* > *two* = surface)

b. There are two guys that Donald didn't find. (*two* > *not* = inverse)"

(Özçelik, 2008, p.2)

In accordance with the Relevance Theory, which holds that utterances create expectations of relevance and the exploration of relevance is the key to human cognition (Sperber & Wilson, 1986/1995, 2002, 2012), Özçelik (2008) conjectures that when the context does not stimulate an expectation that encompasses all the elements in a set, children interpret statements like (30) depending on the ranking of saliency of the found guys. That is, in the absence of any expectations, children tend to prefer the interpretation whose processing requires less effort. In order to find out whether his predictions, which are in line with the Relevance Theory, hold true or not, Özçelik tested 15 English-speaking children in three different conditions using TVJT. In all conditions, the contexts made both the surface and inverse scope interpretations of constructions like (31) available. However, the contexts were constructed in such a way that only the surface scope reading was true. Thus, an answer of 'no' was taken as an indication that the subjects can access the inverse scope reading.

(31) "Two horses didn't jump over the fence."

a. "There are two horses that didn't jump over the fence.
(*two* > *not* = surface: true)

b. It is not the case that two horses jumped over the fence.
(*not* > *two* = inverse: false)"

(Özçelik, 2008, p.2)

The conditions differed from each other in the extent of the relevance of "the set of not jumping horses" to the story. In the first condition, the story was developed in such a way that the children did not notice "the set of not jumping horses". In the story, children were told that four horses were present at the beginning, and at the end, two horses ended up jumping and two didn't. In the second condition, same target statements were presented; however, the contexts devised made "the set of not jumping horses" more noticeable. In the story, "one of the not jumping horses says – after two horses have already jumped – that he has a broken leg (one of his legs was indeed covered in bandage), and therefore, that he doesn't want to jump. After hearing this, the last horse says that it is a good idea, and that he will also stay there with him in order not to leave him alone" (Özçelik, 2008, p.12). As for the third condition, the contexts were created in such a way that the participants first expected all the horses to jump over the fence, but then they found out that this expectation was not realized. The findings indicated that children accepted the utterances like (31) more frequently in Conditions 2 and 3 (60% and 59%) than in Condition 1 (36%). In other words, children favor inverse scope reading when they interpret sentences without any expectations (Condition 1) and surface scope reading when they are provided with an expectation (Condition 3) or a more easy-to-notice "set of not jumping horses" (Condition 2). Özçelik (2008) contends that children do not compute scope interpretations on the basis of overt syntactic relations; instead, they choose interpretations which are more compatible with the context presented, less costly, and mentally more efficient. He further maintains that it is not the conversational implicature (Grice, 1957, 1989) that guides the children's interpretative preferences, but the ranking of saliency.

On the other hand, in their recent work, Conroy, Lidz and Musolino (2009) propose that both parsing mechanisms and the development of the pragmatic knowledge take an active role in children's interpretation of sentences with scope ambiguity. Through an experiment utilizing TVJT, the researchers investigated the children's interpretation of statements including negation and a universally

quantified phrase such as (32) along with a story that met the felicity conditions, as pointed out by Gualmini (2004). A sample script of the story is provided below.

(32) "Every cat didn't hide behind the sofa."

> "In this story, three cats are playing hide-and-seek with a dog. The cats first consider hiding behind the sofa. They initially reject this as a hiding place because the dog might see them running from their initial hiding place behind the box. [At this point in the story, the possibility that no cats hide behind the sofa is made salient as a possible outcome]. The cats soon realize that their hiding place behind the box is not very good because it is easy to see around the box. So, cat 1 and cat 2 run to behind the sofa. At this point, the dog calls out, 'Ready or not, here I come.' Cat 3 realizes that he can't make it behind the sofa in time and so he ducks down behind the box. [At this point in the story, the possibility that not-all cats will hide behind the sofa is made true]"
>
> (Conroy et al., 2009, p.111)

During the experiment, it was emphasized that hiding behind the sofa is the characters' entire goal. The participants were 30 children and 12 adult English speakers. The results demonstrated that adults and the 4-year-olds accepted statements like (32), which were true on the inverse scope interpretation, with percentages of 76% and 81%, respectively, which shows that children and adults are not different from each other in terms of their parsing resources. Yet, the acceptance rate of inverse scope interpretation was slightly below 50% among 5-year-olds, which led the researchers to deduce that age may explain the differences in children's scope interpretations and that there exists a U-shaped curve in the children's development of the semantic knowledge of scope-related interactions. As a final remark, they suggest that the interplay between the developing parsing systems and the ability to integrate discourse-related information can account for children's behavior in scope ambiguity resolution.

Of relevance to the present study is also the research on the processing of scopally ambiguous statements by adult L1 speakers (Kurtzman & MacDonald, 1993; Reinhart, 1997; Tunstall, 1998; Anderson, 2004). For example, Kurtzman and MacDonald (1993) investigated the English native speakers' processing of the constructions with double quantifiers. Employing a timed grammaticality judgment tasks, the researchers aimed to find out whether or not structural information grammatical function, or c-command relations can account for the processing behavior of the native speakers. In the experiments, the target statements such as (33) were followed by continuation statements which included either singular or plural subject NP, as in (33a) or (33b). The respondents were asked to determine whether or not the continuation statement is a natural continuation of the first statement. A representative experimental item is provided below.

(33) "A kid climbed every tree.

Continuation statements:

(33a) The kid was full of energy.

(33b) The kids were full of energy."

(Kurtzman & MacDonald, 1993, p. 252)

A response of "yes" to the continuation statements with a singular subject NP as in (33a) indicated the participants interpreted the target statements on the surface scope reading, while a response of "yes" to the statements with a plural subject NP such as (33b) showed that the participants interpreted the target statements on the inverse scope reading. A total number of 48 subjects took place in the experiments. The results revealed that the L1 English speakers read both of the continuation statements in a similar amount of time. Kurtzman and Macdonald argued that the structural information such as c-command relations cannot not alone account for the data. Instead, they suggested a parallel processing model in which multiple principles are operative in the interpretation of constructions with scope ambiguity. That is, various principles such as c-command relations, contextual plausibility may enable the activation of possible interpretations of a statement. When a particular

interpretation is supported by more than two principles, then the reader has a strong preference for that interpretation. On the other hand, when the principles are in conflict with each other, both interpretations are equally activated, and the competition between alternative interpretations determines the comprehension of scopally ambiguous sentences.

By contrast, Anderson (2004) claims that the processing of quantifier scope in L1 is primarily driven by syntactic principles. In her study, Anderson explored how native English speakers comprehend the constructions containing double quantifiers in real time through four self-paced reading tasks. In the experiments, the target statements such as (34) and (35) were embedded in scenarios favoring either the surface scope reading or the inverse scope reading.

(34) "An experienced climber scaled every cliff.

(35) The instructor did, too."

(Anderson, 2004, p.70)

After the participants read the scenarios along with the target statements, they were asked to answer a comprehension question. The experiments differed from each other in the way that the researcher manipulated the target statements. In the first experiment, the target statements included the non-elided version of the VP-ellipsis statements, but not the quantified sentence, as in (36).

(36) "Surface-scope context

The members of the gourmet club decided to publish a cookbook of their favorite recipes. They wanted the recipes to be easy enough for an inexperienced cook. The president of the club requested that someone volunteer to test the recipes to make sure that the instructions were correct. After a short discussion, **the club's president tested every recipe**."

(Anderson, 2004, p. 356)

In the second experiment, the target statements such as (34) and (35) contained individual level predicates (e.g., loves, knows) instead of stage-level predicates, and they were followed by a final statement, as in (37).

(37) "Surface-scope context

Marnie is taking a course at the community college about classic films. For the final project, the students have to make a presentation about a director whose work they admire. **A fervent student loves every Hitchcock film**. **Marnie does, too**. The presentations will be very interesting."

(Anderson, 2004, p. 377)

In the third experiment, the quantified statements like (34) and the VP-ellipsis statements like (35) were linked by the conjunction *and*, and they were followed by a final statement, as in (38). In all three experiments, the contexts were presented as a chunk, while the target statements were presented in word-by-word fashion.

(38) "Surface-scope context

Once a year, the city tested its emergency alert systems. Because the air-raid sirens were located throughout the city, it took a long time to check that they were all working. Some time in the month of January, **a city employee sounded every siren, and the safety officer did, too.**"

(Anderson, 2004, p. 383)

In the final experiment, the quantified sentence and ellipsis sentence were followed by a sentence carrying information about the end of the story, as in (39). Besides, the contexts were presented in phrase-by-phrase way, while the target statements appeared word-by-word.

(39) "The city | police department | had been | receiving | negative | publicity. The chief | denied that | brutality was | a problem | on the force. However, | when Internal Affairs | investigated, | they discovered that violence | was rampant | throughout the force. | Apparently, **a | junior | constable | had | hit | every | suspect. The | senior | sergeant | had, | too.** Eventually, | the police chief | was forced | to resign."

(Anderson, 2004, p. 383)

The participants were 49 adult native speakers of English. The main finding of the experiments was that the participants took longer to assign the inverse scope reading of the target statements than their surface scope reading. To account for the difficulty observed in the processing of the inverse scope interpretation of the constructions, Anderson (2004) puts forward the Principle of Scope Interpretation which states that the computation of syntactic representations that includes derivations or movements incurs more processing cost than the computation of simple syntactic representations. Given the fact that some additional covert movements should be performed in order to access the inverse scope reading of the target constructions, the researcher maintains that syntactic principles play a primary role in the processing of quantifier scope.

To recap, the research on the acquisition of quantifier scope in L1 has yielded inconclusive results. While some researchers claim that children differ from adults in their scope assignments because they rely on overt syntactic relations, others argue that under certain conditions children can behave like adults in their scope interpretations. In addition, some researchers suggest that children's limited processing resources rather than their incomplete knowledge of grammar may be responsible for the emerging difference between children and adults with respect to scope interpretations. Regarding the processing of quantifier scope in adult native language, there are several accounts that can explain the adult speakers' processing of the constructions with more than one quantifier, and why the access to the inverse scope reading is more costly than the access to the surface scope reading.

2.2. L2 Acquisition and Processing of Scope

Even though considerable amount of research has been devoted to the investigation of how children interpret scopally ambiguous sentence in L1 acquisition, a relatively smaller number of studies have investigated how second language learners acquire the knowledge of properties regarding the interpretation of sentences with quantifier scope in their L2 (Chung, 2009, 2012; Ionin, Luchkina &

Stoops, 2014; Kwak, 2010; Marsden, 2005, 2009). These studies explore to what extent adult second language learners acquire scope interpretations in the target language; whether they display different interpretative preferences from those of native speakers, and what can account for the differences between native speakers and adult L2 learners. For example, Marsden (2005) examined the interpretation of sentences with double quantifiers in L2 Japanese. In particular, comparing the performance of three groups of L2 learners of Japanese with different L1s (Chinese, English, and Korean), she sought to find out the extent to which L1 knowledge of features associated with scope interactions affect scope interpretations in the L2. There were two linguistic phenomena under investigation: (a) the accessibility of object-wide scope reading in statements like (40), where an existential quantifier phrase occupies the subject position of the clause and a universal quantifier phrase appears in the object position, and (b) the accessibility of pair-list reading in interrogative constructions like (41), where *everyone* appears in the subject position and *what* is in the object position.

(40) Dareka-ga dono hon-mo yonda.
someone-NOM every book read
'Someone read every book.'

a. There is some person x such that x read every book. (Subject-wide)

b. *For every book y, there is some person who read y. (Object-wide)

(41) Nani-o daremo-ga katta no.
what-ACC everyone-NOM bought Q
'What did everyone buy?'

a. 'A book.' (Individual answer)

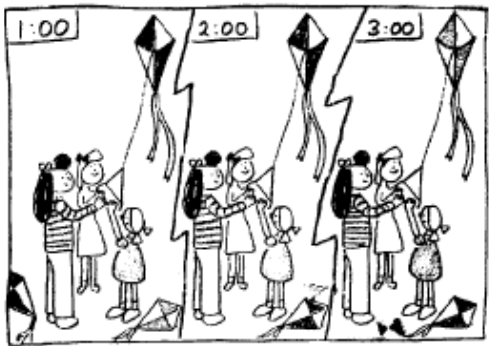
b. *'Bill bought a book, Sally bought a pen, Jane bought a bag, …' (Pair-list answer)" (Marsden, 2005, p.11)

In Japanese, for constructions like (40) object-wide-scope reading is available only in scrambled OSV statements, while subject-wide-scope reading is available in both canonical SOV and scrambled OSV statements. Korean and Chinese are similar to Japanese with regard to the interaction between scope interpretation and word order. By contrast, in English, both scope interpretations are allowed in constructions like (40).

In terms of the differences in scope interpretations of sentences like (41), among the aforementioned languages, Japanese and Korean lack a pair-list reading, that is, they allow only an individual answer, whereas English and Chinese allow a pair list reading. Based on the differences among languages with regard to scope interpretations, Marsden (2005) argued that there are two poverty of stimulus problems encountered by L2 Japanese learners with L1 English and Chinese. First, L1 English-L2 Japanese learners need to learn that the object wide scope reading is not allowed in Japanese, for which they need negative evidence to get rid of the interpretation that is available in their L1. Second, both L1 English and L1 Chinese learners of Japanese need to learn that the pair-list reading is not available in Japanese questions, for which they again need negative evidence to eliminate the interpretation that is available in their L1s.

In order to find out whether or not English-speaking and Chinese-speaking learners of Japanese can have target-like scope interpretations in the absence of sufficient stimulus, Marsden carried out two experiments. In the first experiment, utilizing a picture-based acceptability judgment task, she examined the interpretation of doubly quantified sentences such as (40) by intermediate and advanced L2ers with three different L1s (English, Chinese, and Korean) and English, Chinese, Korean, and Japanese native speakers as control groups. A sample item is presented below.

(42) S > O scope context



"Annin-no	onnanoko-ga	dono	tako-mo	ageta.
three-GEN	girl-NOM	every	kite-Qpt	flew

'Three girls flew every kite. '"

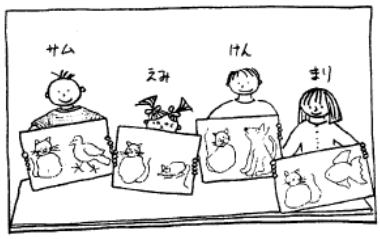
(Marsden, 2005, p. 182-183)

In addition, English, Chinese and Korean versions of the experimental item were created to collect native control data. During the experiment, participants were asked to judge how well each picture matched the corresponding statement through a four-point scale. The results indicated that both L1 Chinese and L1 Korean learners of Japanese with intermediate and advanced proficiency failed to accurately detect the object-wide scope reading in Japanese. On the other hand, intermediate and advanced L1 English-L2 Japanese learners differed from each other in that intermediate L1 English-L2 Japanese learners displayed a tendency to accept the object-wide scope reading of the Japanese statements, whereas advanced L1 English-L2 Japanese learners rejected the object-wide scope reading of the same statements. Marsden (2005) postulates that L1 transfer can account for the emerging differences among the intermediate groups of English, Korean, and Chinese L2 learners of Japanese. With respect to the finding suggesting that advanced English-speaking learners are aware of the constraint regarding the object-wide scope interpretation in Japanese, a constraint which is not instantiated in their L1, she suggests that the result provides evidence for the accessibility of UG in L2 acquisition as the

acquisition of this knowledge represents a poverty of stimulus problem for L2 learners of Japanese with L1 English.

In the second experiment, Marsden investigated the interpretation of constructions involving *everyone* in subject position and *what* in object position, such as (41), by the same groups of participants. The test instrument was an acceptability judgment task presented with picture contexts. A sample experimental item is provided below.

(43)



"Nani-o daremo-ga kaita no?
what-ACC everyone draw.PAST Q
'What did everyone draw?'

a. *Wh-QP answer (individual answer)*:
Neko desu.
cat COP
'A cat.'

b. Wh-QP answer (pair-list answer):
Samu-kun-wa neko to tori-o, Emi-tyan-wa neko
Sam-kun-TOP cat and bird-ACC Emi-chan-TOP cat
to Nezumi-o, Ken-kun-wa neko to Inu-o,
and mouse-ACC Ken-kun-TOP cat and dog-ACC
Mari-tyan-wa neko to Kingyo-o Kaita.
Mari-chan-TOP cat and goldfish-ACC drew
Sam drew a cat and a bird, Emi drew a cat and a mouse,
Ken drew a cat and a dog, Mari drew a cat and a goldfish."

(Marsden, 2005, p.216)

The findings showed that in all groups advanced learners groups displayed more native-like behavior than intermediate groups with regard to the acquisition of the knowledge of the absence of pair-list reading in scrambled interrogative sentences in Japanese. That is, like native Japanese speakers, advanced learners accepted pair-list readings less than individual answers. In contrast, intermediate learners were found not to differentiate between two answer types. In line with the Full Transfer/Full Access model of L2 acquisition (Schwartz & Sprouse, 1996), Marsden argues that L2 learners initially transfer the relevant feature from their L1, but are able to converge on the target feature in the L2.

In a similar vein, Dekydtspotter, Sprouse, and Swanson (2001) studied how intermediate and advanced English L2 learners of French interpret continuous and discontinuous *combien*-interrogatives. In French, the continuous *combien* "how many" constructions, such as (44) can receive both wide and narrow scope readings whereas the discontinuous *combien* constructions, such as (45) allow only narrow scope reading of the wh-phrase.

(44) "Continuous construction: ambiguous

Combien	**de livres**	est-ce	que	tous	les	etudiants	lisent?
how many	of books	is it	that	all	the	students	read

'How many books do all the students read?'"

a. "'What is the number of the books that all the students read in common?' *(indefinite NP wide scope interpretation)*

b. 'For each student, how many books does that student read?' *(indefinite NP narrow scope interpretation)"*

(45) "Discontinuous construction: unambiguous

Combien	est-ce	**que**	tous	les	etudiants	lisent	**de livres?**
how many	is it	that	all	the	students	read	of books

'For each student, how many books does the student read?'
(indefinite NP narrow scope interpretation)"

(Dekydtspotter, Sprouse, and Swanson, 2001, p.178)

Let us consider the following scenario as an example: There are two students in a library, George and Joe, and they each pick up books to read. As George reads *A Tale of Two Cities, Frankenstein,* and *Lord of the Flies*, Joe reads *A Tale of Two Cities, Frankenstein*, and *The Hobbit*. In this scenario, one can answer the question in (44) with either "Two" (i.e., there are two books, *A Tale of Two Cities* and *Frankenstein*, that both George and Joe read) or "Three" (i.e., there are three books that each of them reads). However, the question in (45) can only be answered with 'Three' because it does not allow wide scope reading of the wh-phrase. In English, questions corresponding to (44) receive both wide and narrow scope reading. However, English does not have a structural equivalent of the discontinuous *combien* construction. Dekydtspotter, Sprouse, and Swanson (2001) posited that for English-speaking learners, the acquisition of the difference between continuous and discontinuous *combien* constructions in terms of their interpretations represents a poverty of stimulus problem. In order to investigate English-speaking learners' knowledge of continuous and discontinuous *combien* constructions in French, the researchers administered a TVJT in which the respondents were presented with scenarios written in English followed by a *combien* question and answer. They were then asked whether the answer was correct or not in the given context.

The results indicated no significant difference in advanced L2 learners' acceptance rates of continuous *combien* constructions between narrow and wide scope readings. However, it was found out that advanced L2 learners demonstrate a significant contrast between narrow and wide scope readings in their interpretations of discontinuous *combien* constructions, suggesting that advanced L1 English-L2 French learners have the knowledge of the properties constraining scope relations in discontinuous *combien* interrogatives. Dekydtspotter, Sprouse, and Swanson (2001) concluded that the finding that the relevant knowledge can be indeed acquired by

advanced L2 learners supports the hypothesis that second language acquisition is constrained by principles and parameters of UG.

Although there are several studies conducted on L1-Japanese, -French, -English, and -Chinese, only a few studies have been carried out on native and non-native speakers of Turkish (Ay & Aydın, 2016; Özçelik, 2009). In one of those studies, Özçelik (2009) found that L2 learners can acquire the relevant structure in their L2 and behave like native speakers on the basis of positive evidence, whereas in the absence of positive evidence they fail to expunge the additional interpretation available in their L1 from their grammars. Özçelik investigated how native and non-native speakers of Turkish and English interpret sentences involving numeral quantifiers and negation as in (46).

(46) "Donald did*n't* find *two* guys.

Donald iki çocuk bulmadı.

Donald two child find-NEG-PAST

a. It is not the case that Donald found two guys. (*not* > *two* = surface)

b. There are two guys that Donald didn't find. (*two* > *not* = inverse)"

(Özçelik, 2009, p.171)

In sentences like (46), Turkish allows only the surface scope interpretation as opposed to English, which allows both interpretations. Özçelik postulates the mismatch between Turkish and English regarding the scope interpretations of sentences containing numerical quantifiers and negation constitutes a subset-superset relationship. Accordingly, Turkish represents the subset language, whereas English serves as the superset language.

Özçelik tested 19 L1 Turkish-L2 English learners and 9 L1 English-L2 Turkish learners employing a TVJT. The experimental items were developed in such a way that the stories presented with the items made only inverse scope interpretation true although they were compatible with both of the scope interpretations (i.e., surface and inverse). In the task, the participants were asked to read the scenarios along with the target statements and to judge if the target statements were true in the

given contexts or not. The results indicated that advanced and intermediate L1 Turkish-L2 English learners exhibited scope preferences similar to native English speakers and accepted the sentences more than 90% and 80% of the time, respectively. Yet, both advanced and intermediate L1 English-L2 Turkish learners displayed non-target like L2 performance as they failed to reject the target statements. In accordance with the Semantic Subset Principle (SSP) (Crain, Ni, & Conway 1994; Crain & Thornton, 1998), Özçelik (2009) deduces that Turkish learners of English can expand their grammar and add the interpretation in (46b) to their grammar as a result of the positive evidence in L2 input, while English learners of Turkish fail to expunge the interpretation that is available in their L1 from their grammar because the linguistic environment does not provide them with information that Turkish sentences like (46) do not receive inverse scope reading in (46b).

L2 research of the acquisition of scope has focused on L2 learners' interpretation of scopally ambiguous sentences with double quantifiers or numeral quantifiers and negation; relatively less attention has been paid to the investigation of L2 learners' interpretation of constructions with negation and universally quantified expressions. In one of the few studies, Lee (2009) explored how L1 Korean-L2 English learners interpret statements involving either subject universal quantifier phrase or object universal quantifier and negation, as in (47) and (48).

(47) "Every kid didn't feed the doves in the park.

a. ∀x [kid (x) → ¬ fed the doves in the park (x)] (=none of the kids fed)

b. ¬∀x [kid (x) → fed the doves in the park (x)] (=not every kid fed)"

(48) "Cindy didn't light every candle last night.

a. ¬∀x [candle (x) → Cindy lit (x)] (=Cindy lit only some candles)

b. ∀x [candle (x) → ¬ Cindy lit (x)] (=Cindy lit none of the candles)"

(Lee, 2009, p. 6-7)

In English, sentences like (47) give rise two interpretations, whereas sentences like (48) allow only *not* > *every* interpretation. By contrast, in Korean, sentences like (47) and (48) allow only *every* > *no*t interpretation. In order to

investigate the interpretation of sentences like (47) and (48) by Korean-speaking learners of English, Lee (2009) designed two experiments. In the first experiment, she constructed an offline preference choice task, in which each target statement was followed by two paraphrases. The Korean version of the task was administered to the L1 Korean speakers, and the English version of the task was administered to the L1 English speakers and L1 Korean-L2 English learners. A representative set of items is provided below.

(49) "Universal Quantifier in Subject Position with Long Negation

hwacangsil-eyse	**motun**	haksayng-I	son-ul	ssis-ci **an**h-ass-ta.
restroom-at	every	student-NOM	hand-ACC	wash-CI NEG do-PST-DECL

'Every student didn't wash her hands in the restroom.'"

a. "Full Set Interpretation Paraphrase (*every > not*)

hwacangsil-eyse	amwu-to	son-ul	ssis-ci anh-ass-ta.
restroom-at	any-even	hand-ACC	wash-CI NEG do-PST-DECL

'No students washed their hands in the restroom.'"

b. "Partitioned Set Interpretation Paraphrase (*not > every*)

hwacangsil-eye	myechmteng-uy	haksayng-man	son-ul	ssis-ess-ta
restroom-at	some-GEN	student-only	hand-ACC	wash-PST-DECL

'Only some students washed their hands in the restroom.'"

(Lee, 2009, p.49)

In the study, L1 Korean-L2 English learners were subdivided into three groups (high-intermediate, intermediate, and low-intermediate) based on their level of proficiency in English. The subjects were asked to determine which of the two interpretations was an accurate description of the preceding statement. The findings showed that speakers with L1 Korean preferred the *every* > *not* reading significantly more than the *not* > *every* reading regardless of the syntactic position of the universal quantifier *every*. In contrast, speakers with L1 English found both of the scope interpretations of sentences like (47) accurate at similar rates. However, they

strongly preferred the *not* > *every* interpretation in sentences such as (48). As for the L2 learners of English with different proficiency levels, it was found out that low-intermediate and intermediate L2 learners had similar interpretive preferences in that both of the groups preferred the *every* > *not* reading in construction where universal quantifier *every* appears in either the subject or the object position. However, L2 learners with advanced proficiency were found to pattern closely with native speakers of English in their interpretive preferences, which led the researcher to deduce that L2 learners show a developmental divergence in their interpretations of constructions containing universal quantifier phrases and negation. In the second experiment, Lee (2009) undertook an on-line experiment employing a self-paced reading task in tandem with a TVJT. In the on-line experiments, the participants were presented with contexts which favor either the *not* > *every* or the *every* > *not* interpretation and asked to judge whether the target statement accurately describes the context or not. A sample set of experimental items is presented below

(50) a. "Full set context: *every* > *not*

Mrs. Keenan and her three kids were enjoying the beautiful sunset while taking a walk in the park. Suddenly, many doves flocked to the park. Since the kids were afraid to come near them, they stepped back and watched other people feeding the doves from a distance.

b. Partitioned set context: *not* > *every*

Mrs. Keenan and her three kids were enjoying the beautiful sunset while taking a walk in the park. Suddenly, many doves flocked to the park. Joy and Martina were afraid to come near them and they stepped back. However, Alfred remained there to feed bread crumbs to the doves.

Sentence (Universal Quantifier in Subject Position):

According to the story,/	**every**/	kid/	did**n't** feed/	the doves/
R1	R2	R3	R4	R5

in the park."

R6

(Lee, 2009, p. 93)

In the experiment, the subjects were speakers with L1 Korean, speakers with L1 English, and L1 Korean-L2 English learners with low intermediate and high intermediate proficiency. The findings indicated that both low-intermediate and high-intermediate group of L2 learners entertained scope interpretations similar to those of native English speakers when processing constructions with subject universal quantifier phrase and negation such as (50). That is to say, they preferred the *every > neg* reading more than the *neg > every* reading and produced significantly longer reading times on the *neg > every* interpretation than on the *every > neg* interpretation. With respect to the statements in which universally quantified *every* appears in the object position, the findings indicated that like native speakers of Korean, the low proficiency L2 group strongly preferred the *every > not* interpretation and took longer to associate the target statements with the *not > every* interpretation. However, high-intermediate L2 learners, unlike English native speakers who exhibited a strong tendency to prefer the *neg > every* reading, showed no specific interpretive preferences. Following the processing-based account outlined by O'Grady and Lee (2008) and O'Grady, Lee and Kwak (2008), Lee (2009) argues that the operation of an efficiency-based processor can best account for the acquisition of scope-related constraints. According to this approach, the computation of scope relations is guided not by c-command relations, but by surface linear order. For instance, it predicts that in constructions where a universal quantifier phrase occupies the subject position of the sentence, the *every > neg* reading will be favored more than the *neg > every* reading as it does not require any backtracking and revisions. Lee (2009) contends that for L2 learners with low-intermediate proficiency the processing costs associated with scope interpretations in L1 determine L2 scope preferences. Because in native Korean quantifier phrases always precede negation, the computation of the *every > neg* reading is less costly than the computation of the *neg > every* reading regardless of the syntactic position of the quantifier phrase. Lee (2009) claims that in English the assignment of the *every > neg* reading in constructions with and object quantifier

phrase is as easy as the assignment of the *neg > every* reading since it does not require the processor reanalyze the statement again (for a detailed account, see Lee, 2009). Thus, he argues that the learners with low proficiency may have transferred the *every > neg* reading from their L1 to the L2 because the reading which is favored in L1 does not incur processing cost in L2. However, this approach fails to provide a plausible explanation for the finding that advanced L2 learners exhibited indeterminacy regarding the scope interpretations in online experiment because in the presence of a linear processor they would be expected to prefer the *neg > every* interpretation over the *every > neg* interpretation.

Another study examining the L2 learners' interpretation of constructions containing negation and universal quantifier was conducted by Chung (2012). Employing an off-line contextualized acceptability judgment task, Chung (2012) explored how L1 Korean-L2 English learners interpret constructions with an object universal quantifier phrase and negation. The subjects were 44 L1 Korean-L2 English learners who were divided into three groups (advanced, high-intermediate, and low-intermediate) based on their proficiency, and 20 English native speakers as control group. During the study, the respondents were presented with a context favoring either surface or inverse scope reading, followed by a target statement, and asked to judge the degree to which the target statement is acceptable in the situation given. A sample experimental item is presented below.

(51) "Surface scope context: *neg* > *every*:

Mary woke up late and missed breakfast. She was busy studying for an exam and forgot to eat her lunch. When she came home for dinner, she ate everything she could find at home.

Mary didn't eat every meal.

1	2	3	4
Unacceptable	Not very acceptable	Somewhat acceptable	Acceptable

If 1 or 2, how would you change the sentence?

_____”

(Chung, 2012, p. 296)

The results revealed that speakers with L1 English had a strong tendency to accept target statements presented in the contexts favoring the *neg > every* reading, which indicates their sensitivity to the properties of scalar implicature. That is, the native speakers of English prefer the *neg > every* interpretation because they assume that the speaker would use an informationally stronger expression such as *Mary ate none of the meals* to convey the “none” meaning rather than the *every>not* interpretation of the target statement (Grice, 1957, 1989). A developmental pattern was also found in adult L2 learners’ interpretations of scopally ambiguous sentences. The advanced L2 learners displayed native-like performance in their acceptance of the target statements in surface scope contexts, whereas L2 learners with lower proficiency exhibited a clear preference for the inverse scope reading, which shows that low-intermediate L2 learners carry over interpretive preferences from their L1 to L2. However, the individual analysis of this group revealed that the advanced L2 learners showed greater individual variability, which is suggestive of the fact that the learners’ interpretive preferences may have been influenced, to some extent, by their L1. Given the fact that it is the knowledge of pragmatics that leads native English speakers to assign the *neg > every* reading to the structures with negation and object universal quantifier phrase, Chung (2012) postulates that similar to English native speakers, the learners with high proficiency are capable of employing the knowledge pragmatics in tandem with the knowledge of syntax and semantics in their scope interpretations. However, the advanced learners’ uncertainty in their scope assignments suggests that the learners fail to incorporate the knowledge of pragmatics to the extent that the native speakers do, possibly because of the L1 transfer effects. In other words, the transfer of L1-based interpretive preferences may pose a challenge to L2 learners when having to integrate different kinds of knowledge. Thus, Chung argues that the inclusion of the pragmatic knowledge may

be the last consideration for L2 learners when they are supposed to integrate information from different sources of knowledge, such as syntax and semantics. In addition, Chung (2012) puts forward that the learners' failure to integrate information from different sources may result from their limited processing resources. That is, the learners with high proficiency may find the integration of different types of information hard because they lack adequate processing resources in the L2.

The studies conducted on L2 acquisition of scope indicate a developmental pattern in the interpretation and processing of the constructions with scope ambiguity. In particular, the research on the acquisition of the interaction between negation and universal quantifier in L2 shows that in the initial stages of language acquisition learners may transfer their L1 interpretive preferences to the L2, while in the advanced stages they may recover from the L1 transfer effects. In terms of the processing of quantifier scope in L2, there are only a few studies that have investigated how L2 learners comprehend the statements with negation and universal quantifier in the target language. These studies have reported that there may be a discrepancy between L2 learners' processing behavior and their judgments. That is to say, L2 learners may exhibit native-like patterns in their judgments, while they may process the target structures in a non-target-like way.

The current study is expected to contribute to the literature on quantifier scope in two ways. First, it examines the acquisition of scope in L1 Turkish-L2 English interlanguage. Although several studies have investigated the L2 acquisition of scope in L1-Korean, -Japanese, -French, -Chinese, -Russian, only a few studies have existed on L1 Turkish. Besides, to the best of my knowledge, there have been few studies conducted on how Turkish speaking L2 learners of English interpret constructions containing negation and universal quantifier. Second, the study investigates not only Turkish-speaking L2 learners' offline judgments, but also their online processing of the constructions with negation and universal quantifier. Unlike the majority of the studies which have employed only off-line methods to explore L2

learners' acquisition of scope, the present study utilizes both off-line and on-line methods to gain a better understanding of the target scope phenomenon. The present study has, thus, two objectives: (1) to add to the literature on L2 acquisition of scope by providing data from L1 Turkish-L2 English learners, (2) to provide a clearer picture of the phenomenon in question by experimentally investigating it through off-line and on-line instruments.

CHAPTER 3

OFF-LINE STUDY

In order to establish how English and Turkish native speakers, as well as L2 learners of English with different proficiency levels, interpret sentences with negation and a universally quantified phrase, an off-line questionnaire was administered. A detailed description of the experiment is presented below.

3.1. Participants

This study involves two groups of participants: 1) Turkish native speakers/L2 learners of English, 2) English native speakers.

3.1.1. Turkish native speakers/L2 learners of English

The first group consisted of 92 native speakers of Turkish who are L2 learners of English. Forty-nine of them were female while 43 of them were male with an age range of 17 to 26 (*M*=20.1, *SD*=2.09). Forty-five of the participants in this group were 3rd grade undergraduate students at the Department of Foreign Language Education at METU, while forty-seven of them were students enrolled in preparatory classes at Hacettepe University.

Since one of the research questions is to find out whether or not there are differences in the L2 learners' interpretations of sentences with negation and a universal quantifier phrase across different proficiency levels, the learners in this group were subdivided into two groups on the basis of their general language proficiency in English. In order to identify the proficiency level of the subjects, they were asked to take Oxford Quick Placement Test (OQPT) (Allan, 1992), a standardized English proficiency test, before they were admitted to the off-line study.

In OQPT, thirty-nine of the participants scored between 48 and 54 (*M*=50.19, *SD*=2.22), while thirty-six of them scored between 30-39 (*M*=33.84, *SD*=2.90), indicating that they were low-advanced and low-intermediate level L2 learners respectively (See Appendix A for the OQPT interpretation table). Because 17 participants' scores were in the upper intermediate range (40-47), their L2 data were excluded from the study. Their L1 data, however, were retained.

To determine whether the difference between the OQPT scores of the two groups (low-intermediate and low-advanced) is significant, an independent-samples t-test was performed. The results confirmed that the groups scored significantly differently in the OQPT, $t(73) = -27.17$, $p<.001$. For simplicity, I will refer to the low-intermediate L2 learners as *intermediate L2 learners*, and the low-advanced L2 learners as *advanced L2 learners* in the remainder of the thesis.

3.1.2. English native speakers

The second group included 44 native speakers of English (female = 20; male = 24). The average age of this group was 29 (*SD*=6.01), the oldest one being 46 and the youngest member 20 years old. Thirty-nine of the subjects were from the United States whereas 5 of them were from Great Britain.

3.2. Instruments

Two Contextualized Acceptability Rating Tasks (CARTs) were designed. In the tasks, the participants were asked to determine the extent to which a target statement involving a universal quantifier phrase and negation was acceptable in a given context. The purpose of the test was to establish the baseline for Turkish and English native speakers' interpretive preferences when it comes to sentences involving negation and a universally quantified expression and to examine how L2 learners of English interpret such constructions.

CART was designed in both Turkish and English. In the task, each target statement was presented with a context boosting the saliency of either the surface or

the inverse scope reading of the statement. The participants were asked to read each context followed by a sentence describing the context (the target sentence) and to judge the acceptability of the target sentence on a scale from 1 to 5 (1: Unacceptable, 2: Somewhat unacceptable, 3: Neutral, 4: Not very acceptable, 5: Acceptable). Acceptability ratings were related to the meaning of the sentence, rather than to the grammatical accuracy since all sentences were fully grammatical. In other words, the subjects were asked to judge the extent to which each target sentence describes the context given in an acceptable way. A five-point scale was chosen for two reasons. First, the extent of certainty regarding the interpretation of a particular construction cannot be accurately measured through binary judgments. Second, the involvement of scalar implicature in scope interpretations may pose problems for data collection based on binary judgments because the inclusion of scalar implicature is related not to grammaticality, but to appropriateness (Gualmini, 2008; Ionin & Zyzik, 2014). Considering the fact that there are no clear cut distinctions between the two scope readings (surface and inverse) of the target constructions in terms of grammaticality, it may be misleading to collect the judgment data through binary response scales.

The CART contained 16 sets of experimental items. The experimental items in the task varied along two dimensions: 1) the syntactic position (subject *vs*. object) of the universally quantified phrase (*every* NP) and 2) the scope interpretation that the context favors (surface scope *vs*. inverse scope). In eight sets of experimental items, the universally quantified phrase (*every* NP) was in the object position of the target sentence (QP OBJECT Condition), while in the rest of them, it was in the subject position of the target sentence (QP SUBJECT Condition). Four of the eight sets of experimental items with a universally quantified subject were presented with situations favoring the surface scope reading, while the others were presented with situations favoring the inverse scope reading. Likewise, half of the eight sets of experimental items with a universally quantified object were presented with situations favoring the surface scope reading, while the rest of them were presented with situations favoring the inverse scope reading (see Table 1).

Table 1. *The Distribution of the Experimental Items across Two Lists*

	Universal Quantifier in the Subject Position		Universal Quantifier in the Object Position	
	Surface Scope	Inverse Scope	Surface Scope	Inverse Scope
List-1	4	4	4	4
List-2	4	4	4	4
Total	16		16	

A representative set of experimental items in Turkish is presented below.

(52) Universal Quantifier in the Subject Position

a. Surface Scope Reading (*neg* > *every*)

Dün Duygu'nun akşam yemeği için üç misafiri vardı. Misafirleri için balık pişirmişti. Ancak misafirlerden biri balık alerjisi olduğu için balık yemedi. Duygu da ona pizza sipariş etti.

English translation:

'Last night Duygu had three guests over for dinner and she cooked fish for them. However, one of her guests didn't eat the fish because of her allergies. So, Duygu ordered pizza for her.'

b. Inverse Scope Reading (*every* > *neg*)

Dün Duygu'nun akşam yemeği için üç misafiri vardı. Misafirleri için balık pişirdiği sırada zil çaldı. Döndüğünde ise kedisi bütün balıkları yemişti. O da misafirleri için pizza sipariş etti.

English translation:

'Last night Duygu had three guests over for dinner. While she was preparing fish for them, there was a knock at the door. When she came

back into the kitchen, her cat had eaten all the fish. So, she ordered pizza for her guests instead.'

Experimental Sentence:
Her misafir balık yemedi.

English translation:
'Every guest didn't eat fish.'

(52) Universal Quantifier in Object Position

a. Surface Scope Reading (*neg* > *every*)
Defne abisine hediye almak için kitapçıya gitti. Beş farklı kitap almaya karar verdi. Ancak cebindeki para sadece iki kitap almaya yettiği için Defne diğer kitapları yerlerine bıraktı.

English translation:
'Defne went to the bookstore to buy a gift for her brother. She decided to buy five books for him. However, she only had enough money for two of the books. So, she put the others back on the shelf.'

b. Inverse Scope Reading (*every* > *neg*)
Defne abisine hediye almak için kitapçıya gitti. Beş farklı kitap almaya karar verdi. Ancak kasaya gittiğinde cüzdanını evde unuttuğunu fark etti ve Defne, kitapları yerlerine bıraktı.

English translation:
'Defne went to the bookstore to buy a gift for her brother. She decided to buy five books for him. However, at the checkout, she realized that she had left her purse at home. So, she put the books back on the shelf.'

Experimental sentence:

Defne her kitabı almadı.

English translation:

'Defne didn't buy every book.'

In addition to 16 ambiguous experimental items, 20 filler items, which were similar to the experimental items in format, were constructed. The filler items involved 8 ambiguous and 12 unambiguous statements which were presented with scenarios. The 8 ambiguous statements displayed different types of ambiguity from the test items: they either included double quantifiers or an existential quantifier phrase and negation. The 12 unambiguous statements were composed of 4 statements with only negation, 4 statements with only a universally quantified phrase, and 4 statements involving neither negation nor a universally quantified expression. An example set of filler items is provided below.

(53) Ambiguous Filler Item with a Context

Geçen Cuma on turist İzmir'deki müzeleri gezmeye karar verdi. Ancak turistlerden sadece üçü bütün müzeleri gezdi. Diğerleri ise iki müze gezdikten sonra yüzmeye gittiler.

English translation:

'Last Friday, ten tourists decided to visit all the museums in İzmir. However, only three of them visited all of the museums. The rest of them went swimming after having visited two museums.'

Statement:

Her turist bazı müzeleri gezdi.

English translation:

'Every tourist visited some museums.'

(54) Unambiguous Filler Item with a Context

Geçen Pazar dört hakem maç yapmak için A takımındaki futbolcuları aramaya karar verdi. Ancak sadece ikisi futbolcuları aradı, çünkü diğerlerinde futbolcuların numaraları yoktu.

English translation:

'Last Sunday, four coaches decided to call the players the A team to play a match. However, only two of the coaches ended up calling the players because the others didn't have their phone numbers.

Statement:

Bütün hakemler futbolcuları aradı.

English translation:

'All the coaches called the players.'

Next, two presentation lists were constructed out of the 16 sets of test items so that each participant would see only one condition for each target statement and never respond to the same target sentence more than once. The experimental items were then interspersed with 20 fillers. In each list, the experimental items along with the fillers were randomized. After randomization, the lists were checked to ensure that one condition did not appear consecutively. A complete list of experimental items along with the fillers can be found in Appendix B.

An English version of the CART was also devised and administered to native speakers of English to set the baseline for the way in which sentences with negation and a universally quantified phrase are interpreted in native English (Appendix C). The English CART was also administered to the group of native speakers of Turkish/L2 learners in order to see how L1 Turkish-L2 English learners interpret scopally ambiguous sentences with negation and a universally quantified expression.

For both versions of the CART, proper names or place names were modified so that the native speakers of the language in question would feel comfortable

understanding the contexts. To check the naturalness of items and to identify possible problems to be encountered in the actual study with respect to the clarity of the meaning in experimental items and fillers in both versions of CART, a pilot study was undertaken on two groups of native speakers (native speakers of Turkish and native speakers of English). Each group was comprised of 4 native speakers. During piloting, the native speakers were asked to indicate any points which were not clear enough or were misleading in the items. After piloting, one of the experimental items was reformulated to make the meaning clearer and one of the fillers was replaced with a different one.

Besides the CART presented in English and Turkish, a background questionnaire was designed in order to collect information about the learners' language learning background. In this questionnaire, learners were asked to provide specific information about their age, native and non-native languages, their use of target language in their daily lives, and so forth (Appendix D).

In order to administer both versions of the CART and background questionnaire without the constraints of time and place, the online versions of the CART in English and Turkish along with the background questionnaire were created through www.surveygizmo.com, a web-based survey tool.

3.3. Procedure

With the aim of subdividing the native speakers of Turkish on the basis of their proficiency levels in English, the OQPT was first administered. The time allotted for the OQPT was 30 minutes. After the measurement of the L2 learners' proficiency level using OQPT, native speakers of Turkish/L2 learners of English were asked to complete the online version of the Turkish CART. The link to the CART was sent to the participants in an e-mail. The completion of the test took approximately 20 minutes. In order to avoid any possible priming effect, native speakers of Turkish/L2 learners of English were asked to complete the online version of the CART in English after an interval of two weeks. Native speakers of English

were also requested to take part in the study through email. Sample items along with specific instructions were provided in the online versions of the two CARTs.

3.4. Data Analysis

Prior to the analysis of the data, the participants' mean rating scores for 12 unambiguous felicitous and infelicitous fillers was checked to ensure that the respondents paid enough attention to the task for each group separately.

Quantitative data obtained in the off-line study were analyzed using descriptive and inferential statistics (independent-samples t-test, paired-samples t-test, and ANOVA) with the SPSS Version 20.0. The mean rating scores and standard deviation values of the four sets of results (native Turkish data, native English data, intermediate L2 English data, and advanced L2 English data) were calculated through descriptive statistical analyses. To determine whether or not the differences in the mean ratings of the participants' scope interpretations were statistically meaningful (across and within groups) independent-samples t-tests and paired-sample t-tests were run on the data. To find out the effects of group (native speakers of Turkish, native speakers of English, intermediate L2 learners of English, and advanced L2 learners of English) and the bias of the context (surface *vs* inverse) on mean rating scores of test items with either subject QP or object QP, ANOVAs (within-participant independent variable: bias of the context, between-participant independent variable: groups, dependent variable: mean rating scores of test items) were conducted for each condition (QP SUBJECT and QP OBJECT). The Tukey-HSD tests were also used for multiple comparisons.

3.5. Results

3.5.1. Scope Interpretations of Native Speakers of Turkish

The Turkish native speakers' mean rating scores for unambiguous felicitous fillers was 4.65, and it was 1.35 for unambiguous infelicitous fillers. In order to set the baseline for Turkish native speakers' interpretations of sentences with negation

and a universally quantified subject or object, Turkish native speakers' mean rating scores of the experimental items were compared. Table 2 presents the descriptive statistics of the Turkish native speakers' mean rating scores of the test items.

Table 2. *The Descriptive Statistics of the Turkish Native Speakers' Rating Scores of the Experimental Items (n=92)*

Bias of the Context	QP SUBJECT Condition		QP OBJECT Condition	
	Mean (SD)	Range	Mean (SD)	Range
Surface Scope	2.87 (1.33)	1-5	4.47 (.70)	2-5
Inverse Scope	4.32 (.75)	1.25-5	2.69 (1.22)	1-5

A paired samples t-test was performed to find out if the differences in the Turkish native speakers' scope interpretations were statistically meaningful. The findings revealed that in the QP SUBJECT condition there was a statistically significant difference between the mean ratings of surface scope (M=2.87, SD=1.33) and inverse scope (M=4.32, SD=.75) readings of the participants, $t(91) = -8.70$, $p<.001$. Likewise, it was found out that in the QP OBJECT condition, the difference in the mean ratings of surface scope (M=4.47, SD=.70) and inverse scope (M=2.69, SD=1.22) readings of the participants was statistically meaningful, $t(91)=11.5$, $p<.001$. These results indicated that in the QP SUBJECT condition, Turkish native speakers accepted target statements presented in inverse scope contexts significantly more than those presented in surface scope contexts. On the other hand, in the QP OBJECT condition, the acceptance rate of statements in surface scope contexts by Turkish native speakers was significantly higher than the acceptance rate of statements in inverse scope contexts.

3.5.2. Scope Interpretations of Native Speakers of English

The English native speakers' mean rating scores for unambiguous felicitous fillers was 4.5, and it was 1.25 for unambiguous infelicitous fillers. To measure the baseline for English native speakers' interpretations of sentences with negation and a universal quantifier, I examined English native speakers' mean rating scores of the test items which are presented with a context boosting the saliency of either the surface or the inverse scope interpretation. Table 3 shows the descriptive statistics regarding the English native speakers' mean ratings of the experimental items.

Table 3. *The Descriptive Statistics of the English Native Speakers' Rating Scores of the Test Items (n=44)*

Bias of the Context	QP SUBJECT Condition		QP OBJECT Condition	
	Mean (SD)	Range	Mean (SD)	Range
Surface Scope	3.48 (1.14)	1-5	4.52 (.66)	2.25-5
Inverse Scope	2.92 (1.16)	1-5	2.71 (1.12)	1-4.75

A paired samples t-test indicated that in the QP SUBJECT condition there is a statistically significant difference between the mean ratings of surface scope (M=3.48, SD=1.14) and inverse scope (M=2.92, SD=1.16) readings, $t(43)$=-2.25, p=.014. However, the standard deviation values displayed in Table 3 showed that the native speakers of English exhibited high variability in their mean ratings of both the surface scope (1.14) and inverse scope (1.16) interpretations. In other words, the group of English native speakers seemed ambivalent in their acceptance of both surface and inverse scope readings, suggesting that they indeed find sentences with a subject universal quantifier phrase and negation ambiguous although they tend to rate target statements presented in surface scope contexts higher than those presented in inverse scope contexts.

The results also showed that in the QP OBJECT condition there was a statistically significant difference between the mean ratings of the surface scope (*M*=4.52, *SD*=.66) and inverse scope (*M*=2.71, *SD*=1.12) interpretations of the participants, *t*(43)=9.23, *p*<.001. This indicates that native speakers of English demonstrated a preference for the surface scope reading of the target statements with negation and universally quantified object.

3.5.3. The Comparison of Scope Interpretations of Turkish and English Native Speakers

To determine whether the mean differences in scope interpretations between Turkish and English native speakers were statistically meaningful an independent-samples t-test was conducted. With regard to the QP SUBJECT condition, the results revealed that the Turkish (*M*=2.87, *SD*=1.33) and English (*M*=3.48, *SD*=1.14) native speakers differed significantly in their acceptance of surface scope interpretations, *t*(134)=-2.61, *p*<.001. The findings also showed a significant difference between the native speakers of Turkish (*M*=4.32, *SD*=.75) and English (*M*=2.92, *SD*=1.16) in their acceptance rate of statements in inverse scope contexts, *t*(134)=8.44, *p*<.001. These results indicate that the native speakers of Turkish and English have opposing scope preferences in their interpretations of sentences containing a universally quantified subject NP and negation. That is, Turkish native speakers exhibited a stronger tendency to accept the sentences presented in the inverse scope contexts than their English counterparts, whereas the English native speakers accepted sentences presented in the surface scope contexts more than their Turkish counterparts.

In the QP OBJECT condition, the results showed that the Turkish (*M*=4.47, *SD*=.70) and English (*M*=4.52, *SD*=.66) native speakers did not differ significantly in their mean ratings of surface scope readings, *t*(134)=-.397, *p*>.05. Similarly, no significant difference was found in the mean ratings of inverse scope interpretations between Turkish (*M*=2.69, *SD*=1.22) and English (*M*=2.71, *SD*=1.12) native

speakers, $t(134)=-.054$, $p>.05$. The findings suggest that Turkish and English native speakers display similar scope preferences when interpreting sentences with an object universal quantifier and negation: they both prefer the surface scope reading.

3.5.4. Scope Interpretations of Turkish L2 Learners of English

The advanced L2 learners' mean rating scores for the unambiguous felicitous fillers was 4.4, and it was 1.31 for the unambiguous infelicitous fillers. Likewise, the intermediate L2 learners' mean rating scores for the unambiguous felicitous fillers was 4.35, and it was 1.38 for unambiguous infelicitous fillers.

In order to answer the research question how Turkish L2 learners of English interpret sentences involving a universally quantified phrase and negation in English, L2 learners' mean rating scores of the experimental items were computed. Table 4 illustrates the descriptive statistics of the intermediate and advanced L2 learners' mean rating scores of sentences in both conditions.

Table 4. *Descriptive Statistics of L2 Learners' Rating Scores of Test Items*

		Intermediate (*n*=39)		Advanced (*n*=36)	
	Bias of the Contexts	Mean (SD)	Range	Mean (SD)	Range
QP SUBJECT	Surface	3.98 (.88)	1-5	2.82 (1.28)	1-5
Condition	Inverse	3.58 (1.12)	1.25-5	3.40 (1.03)	1-5
QP OBJECT	Surface	4.54 (.51)	3.25-5	4.60 (.50)	3-5
Condition	Inverse	3.85 (.90)	2-5	2.73 (1.09)	1-4.5

With the purpose of comparing the mean ratings of experimental items in surface and inverse contexts, paired-samples t-tests were carried out for each group. The results indicated that in the QP SUBJECT condition, there was no statistically significant difference between the intermediate learners' mean ratings of surface

scope (*M*=3.98, *SD*=.88) and inverse scope (*M*=3.58, *SD*=1.12) readings, *t*(38)=1.60, *p*>.05. By contrast, a statistically significant difference was found between the advanced learners' mean ratings of surface scope (*M*=2.82, *SD*=1.28) and inverse scope (*M*=3.40, *SD*=1.03) readings, *t*(35)=-2.90, *p*<.001. In other words, in the QP SUBJECT condition, intermediate learners found both scope interpretations almost equally acceptable, whereas advanced learners judged the sentences in inverse scope contexts as more acceptable than those in surface scope contexts. In the QP OBJECT condition, both groups rated the two scope interpretations differently at a significant level (intermediate learners: *t*(38)=4.1, *p*<.001; advanced learners: *t*(35)=8.1, *p*<.001). That is, both intermediate and advanced learners displayed a preference for accepting target statements in surface scope contexts.

3.5.5. The Comparisons of Scope Interpretations across Groups

Figures 1 and 2 summarize the mean rating scores of the four groups (Turkish native speakers, English native speakers, intermediate L2 learners, advanced L2 learners) in QP SUBJECT and QP OBJECT conditions.

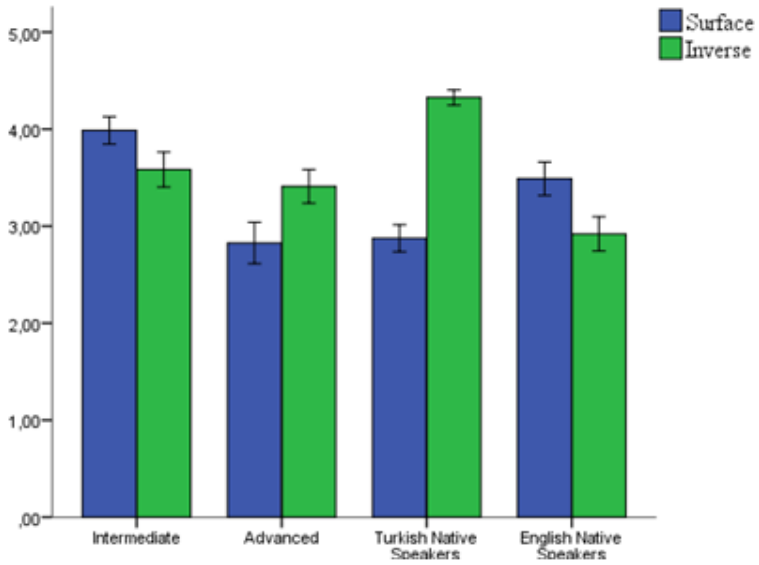


Figure 1. *Mean Rating Scores across Groups in QP SUBJECT Condition*

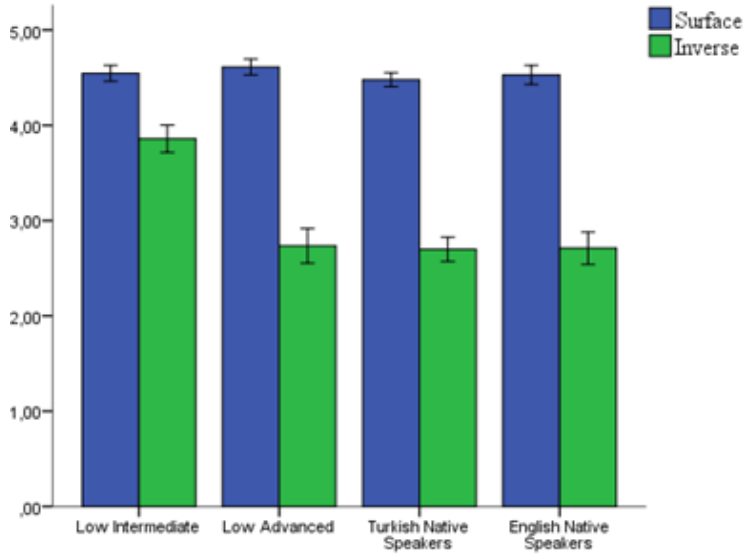


Figure 2. *Mean Rating Scores across Groups in QP OBJECT Condition*

To find out whether the intermediate and advanced L2 learners differ from English native speakers in their scope interpretations, a one-way ANOVA with group (intermediate L2 learners, advanced L2 learners, and English native speakers) as a between-participant factor, and the bias of the context (surface vs inverse) as a within-participant factor was performed for each condition (QP SUBJECT and QP OBJECT). In the QP SUBJECT condition, there was a statistically significant difference among the three groups in their mean ratings of the surface scope reading, [$F(2,116)=10.23$, $p<.001$], and in their mean ratings of inverse scope reading, *[*$F(2,116)= 3.91$, $p=.022$]. To determine which group(s) differed from the others, a post-hoc comparison test was undertaken. The Tukey HSD test indicated that both intermediate and advanced L2 learners' mean rating scores of the surface scope interpretations ($M=3.98$, $SD=.88$; $M=2.82$, $SD=1.28$ respectively) did not differ significantly from that of English native speakers ($M=3.48$, $SD=1.14$), suggesting that both groups of L2 learners displayed native-like behaviors in their

interpretations of surface scope contexts.[1] The advanced learners (*M*=2.82, *SD*=1.28), however, differed from the intermediate learners (*M*=3.98, *SD*=.88) in their mean rating of the surface scope reading. On the other hand, the intermediate L2 learners' mean rating score of inverse scope contexts (*M*=3.58, *SD*=1.12) differed significantly from that of English native speakers (*M*=2.92, *SD*=1.16), whereas no significant difference was observed in the mean rating scores of inverse scope contexts between the advanced L2 learners (*M*=3.40, *SD*=1.03) and English native speakers (*M*=2.92, *SD*=1.16). These results suggest that both intermediate and advanced L2 learners behaved like English native speakers when interpreting sentences in surface scope contexts. However, they differed from each other in that the intermediate L2 learners were more eager to judge sentences presented in inverse scope contexts acceptable than speakers with L1 English, whereas the L2 learners in the advanced group exhibited a pattern similar to that of English native speakers when interpreting sentences presented in contexts biased for the inverse scope reading.

In the QP OBJECT condition, there was also a statistically significant difference among the three groups in their mean ratings of the inverse scope interpretation, [$F(2,116)=15.49$, $p<.001$]. The Tukey HSD test revealed that the intermediate L2 learners' mean rating scores of inverse scope readings (*M*=3.85, *SD*=.90) differed significantly from those of English native speakers (*M*=2.71, *SD*=1.12), while the advanced L2 learners (*M*=2.73, *SD*=1.09) and English native speakers (*M*=2.71, *SD*=1.12) were similar in their mean ratings of the inverse scope interpretation. Taken together, these results indicate that unlike the advanced L2 learners and speakers with L1 English, the intermediate L2 learners judged inverse scope reading of target statements more acceptable than their surface scope reading.

In order to answer the research question regarding the extent to which L2 learners of English with different proficiency levels (intermediate and advanced)

[1] The difference between the advanced learners and the native English speakers in their mean ratings of the surface scope reading approached significance, $p=.076$.

transfer their L1 interpretation of sentences involving a universal quantifier and negation to their L2 English counterparts, another one-way ANOVA with group (intermediate L2 learners, advanced L2 learners, and Turkish native speakers) as a between-participant factor and the bias of the context (surface *vs* inverse) as a within-participant factor was carried out for each condition (QP SUBJECT and QP OBJECT) on the data obtained from L2 learners and Turkish native speakers. In the QP SUBJECT condition, a statistically significant difference among the three groups was found not only in the mean ratings of the surface scope reading, [$F(2,164)= 12.43$, $p<.001$], but also in the mean ratings of the inverse scope reading, [$F(2,164)=17.13$, $p<.001$]. To identify differences among groups with regard to their scope interpretations, a post-hoc comparison test was performed. The Tukey HSD test revealed that intermediate L2 learners differed significantly from the Turkish native speakers in the mean rating score of the surface scope contexts (M=3.98, SD=.88; M=2.87, SD=1.33 respectively), whereas no significant difference was found between the mean rating scores of the advanced L2 learners (M=2.82, SD=1.28) and the Turkish native speakers (M=2.87, SD=1.33). Additionally, the findings indicated a meaningful difference in the mean rating scores of the surface scope contexts between the intermediate (M=3.98, SD=.88) and advanced learners (M=2.82, SD=1.28), $p<.001$. These results suggest that intermediate learners showed a tendency to accept the surface scope interpretation considerably more than the advanced learners and native speakers of Turkish. Besides, SD values in Table 4 reveal that L2 learners with intermediate proficiency showed the least variability in their scope judgments among all the groups and thus rated the acceptability of the target sentences more confidently than any other group, indicating that they seemed to be guided by the bias of the context to the greater extent than the advanced L2 learners. Regarding the inverse scope interpretation, it was found out that both groups of L2 learners (intermediate: M=3.58, SD=1.12, advanced: M=3.40, SD=1.03) differed significantly from the Turkish native speakers (M=4.32, SD=.75). These findings suggest that the L2 learners with intermediate and advanced proficiency

exhibited different patterns from the native Turkish speakers when interpreting sentences in inverse scope contexts.

In the QP OBJECT condition, a statistically significant difference was found among the three groups in their mean ratings of the inverse scope interpretation, [$F(2,164)=15.45$, $p<.001$]. The Tukey HSD test showed that the L2 learners with intermediate proficiency ($M=3.85$, $SD=.90$) differed significantly from the advanced learners ($M=2.73$, $SD=1.09$) and Turkish native speakers ($M=2.69$, $SD=1.22$) in the mean rating of the inverse scope interpretation. Unlike the advanced L2 learners and native speakers of Turkish, the intermediate L2 learners were inclined to accept the sentences in inverse scope contexts.

3.6. Discussion

The off-line study was conducted to investigate how Turkish L2 learners of English with two different proficiency levels (intermediate and advanced) interpret statements containing negation and a universally quantified phrase in their target language, given the baseline for English and Turkish native speakers' interpretations of such constructions. The results confirmed that Turkish and English native speakers have different preferences in the interpretation of the construction in the QP SUBJECT condition. The results, however, were inconsistent with the theoretical accounts (Horn, 1989; Jackendoff, 1972; May, 1977, 1985) which claim that the construction is ambiguous. By contrast, native speakers of English displayed a preference for the surface scope reading of the target constructions over their inverse scope reading. The result which would confirm the theoretical accounts proposed by Horn (1989), Jackendoff (1972), and May (1977, 1985) would be the one in which there was no significant difference in the native speakers' mean rating scores between the surface scope and the inverse scope reading. The results also run counter to the argument made by Beghelli & Stowell (1996), who claim that sentences with negation and a universal quantifier in the subject position do not exhibit the surface scope reading, because the native speakers of English preferred the *every > neg*

reading over the *neg > every* reading, which indicates that the *every > neg* reading is available in English constructions with negation and QP in the subject position. These results, on the other hand, were in tune with the empirical findings (Conroy, 2008; Lee, 2009) in that the English native speakers demonstrated a preference for the surface scope reading (*every > neg*) rather than the inverse scope reading (*neg > every*).

In the QP OBJECT condition, the speakers with L1 English displayed a clear preference for the surface scope reading (*neg > every)*, in line with the account proposed by Aoun and Li (1993) and previous research that tested the interpretation of the statements involving negation and object universal quantifier by the native English speakers (Musolino & Lidz, 2006; Musolino, 2006; Chung, 2009).

Regarding the Turkish native speakers' interpretations, they always interpreted the universal quantifier *her* 'every' within the scope of negation in both conditions, in tune with Kelepir (2001). In other words, in the QP SUBJECT condition, they favored the inverse scope reading over the surface scope reading, while in the QP OBJECT condition, they showed a preference for the surface scope reading in their interpretations. Thus, English and Turkish native speakers exhibited similar interpretive preferences in the QP OBJECT condition in their respective languages.

With regard to the scope interpretations of Turkish L2 learners of English, advanced L2 learners manifested non-target-like behavior in their interpretations of statements in the QP SUBJECT condition. More precisely, the advanced learners accepted target constructions presented with contexts favoring the inverse scope interpretation significantly more than those presented with contexts favoring the surface scope interpretation, which parallels the interpretive preferences not of English native speakers, but Turkish native speakers. Recall that the native speakers of Turkish displayed an overwhelming preference for the inverse scope interpretation of statements in the QP SUBJECT condition.

The finding that advanced L2 learners exhibited patterns similar to those of Turkish native speakers in this condition and different from English native speakers fails to support the hypothesis I formulated in line with the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987). Based on the Subset Principle, I expected the advanced L2 learners to attain the surface scope reading of such constructions, which is not available in their L1, and to expand their existing grammar through positive evidence available in L2 input. However, my results suggest that advanced L2 learners have not yet modified their native grammar and extended their grammar with an additional interpretation, which contradicts the findings of the research conducted by Özçelik (2009), Marsden (2005), Chung (2012), and Lee (2009).

On the Full Transfer/Full Access Hypothesis (Schwartz & Sprouse, 1996) non-target-like behavior of the advanced L2 group means that the learners in this group have transferred the interpretive preferences from their L1 to the L2. Studies that investigated the acquisition of L2 scope interpretations (Dellicarpini, 2003, Lee et al., 1999; Marsden, 2005, 2009) have often reported that traces of native language can be found in in L2 learners with low or intermediate proficiency level. It is then conceivable that advanced learners in this study are not advanced enough to recover from the effects of L1 transfer observed in their L2 scope interpretations.

However, the advanced L2 learners were found to pattern closely with the English native speakers in their interpretations of statements in the QP OBJECT condition, which provides evidence for my second hypothesis stating that there will be no significant differences between the English native speakers and advanced L2 learners in this condition given the fact that Turkish and English are similar to each other in terms of the scope interpretations that they allow in such constructions. Therefore, it can be stated that the similarity between the L2 learners' native language and target language in this condition facilitated the L2 acquisition of the target phenomenon by the advanced L2 learners.

By contrast, the L2 learners with intermediate proficiency were found to display almost native-like behavior in the QP SUBJECT condition. More specifically, the intermediate L2 learners accepted the target statements in surface and inverse scope contexts at similar rates and judged both the surface and the inverse scope interpretations of the target statements as acceptable. This result does not confirm the hypothesis I made in accordance with the Full Transfer/Full Access Hypothesis (Schwartz & Sprouse, 1996) and the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987). Following the Full Transfer/Full Access Hypothesis and the Subset Principle, I expected the intermediate L2 learners to behave like Turkish native speakers with regard to their interpretations and permit only the inverse scope reading of the target constructions in the QP SUBJECT condition since the initial state of L2 grammar is assumed to be the end state of L1 grammar (White, 2003). However, the result that the intermediate L2 learners differed significantly from the native speakers of Turkish in their scope interpretations of the target constructions suggests that the initial transfer of entire L1 grammar cannot account for the data obtained in this study, contrary to the claims made by Özçelik (2009) and Marsden (2005).

There seem to be two alternatives that can explain the surprising performance of the L2 learners with intermediate proficiency in the QP SUBJECT condition. One alternative is that the intermediate L2 learners may have succeeded in adding the reading that is not available in their L1 to their L2 grammar through positive evidence, and thus they may have expanded their existing grammar in line with the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987). Another alternative is that the learners may have developed a guessing strategy to judge the acceptability of the target constructions in the task, which also implies their unawareness of the scope phenomena in question. In order to discriminate between these two explanations, I turn to the intermediate interpretations of statements in the QP OBJECT condition.

In this condition, intermediate L2 learners displayed a preference for the surface scope contexts, but had a higher rate of acceptance for the inverse scope readings than both the English and Turkish native speakers. This high rate of acceptance of the target statements in the QP OBJECT condition presented in inverse scope contexts strengthens the possibility that the intermediate participants judged the acceptability of the target statements through a guessing strategy. Similar results were also obtained in Marsden (2004, 2009). Drawing on Sprouse's (2006) lexical transfer proposal, which redefines the Full Transfer as a process of "relabeling" the L1 based lexical entries in the interlanguage lexicon with the relevant properties of the lexical items in the target language, Marsden (2004, 2009) attributed the divergent behavior of the intermediate L2 learners to their assignment of the target quantifier to an inaccurate L1-based lexical slot in their interlanguage. Marsden suggested that the L2 learners with low proficiency failed to correctly associate the target lexical item with its counterpart in their native language, which leads them to demonstrate a relatively higher rate of acceptance for a particular scope interpretation than the native speakers.

Taken together, the intermediate and the advanced L2 learners' judgments of the constructions involving negation and a universal quantifier do not result in a developmental pattern. In addition, the intermediate L2 learners, who were presumed to be in the initial stages of second language acquisition, did not seem to be transferring their entire set of L1 grammar to their L2 grammar. This is an unexpected finding given the prediction that the "full transfer" of the L1 grammar takes places at the initial stages of L2 acquisition (Schwartz & Sprouse,1996). This finding is, however, compatible with the results obtained in the studies undertaken by Pienemann, Di Biase, Kawaguchi and Håkansson (2005), Håkansson, Pienemann and Sayehli (2002), Håkansson (1997, 2001), Hulk (1991), Johnston (1997), Kawaguchi (1999), Di Biase and Kawaguchi (2002), Möhring (2005), and Rahkonen (1993) in that at the onset of L2 acquisition, the learners do not carry over their L1 grammar in its entirety to their L2. One proposal that can account for the divergent

pattern observed in the L2 learners' scope interpretations is the Developmentally Moderated Transfer Hypothesis (DMTH) which was put forward by Håkansson, Pienemann and Sayehli (2002) and Pienemann, Di Biase, Kawaguchi and Håkansson (2005) building upon the Pienemann's Processability Theory (1998a, 1998b). The basic premise on which this hypothesis rests is that L2 learners can transfer only the linguistic structures that they can process within their developing L2 system. In other words, the linguistic forms are carried over from L1 to L2 when the L2 processing system is developmentally ready to process them. Pienemann (1998) claims that the L2 acquisition involves a process of reconstruction in which "L1 formulator will not be "bulk-transferred" (p. 81). Instead, he suggests that L1 transfer takes place as part of reconstruction process and it is "developmentally moderated". That is to say, L2 learners are supposed to acquire certain processing prerequisites in their L2 in order to be able to employ their L1 processing procedures in their L2. As highlighted by Pienemann (2005) and Pienemann and Kessler (2011), the Developmentally Moderated Transfer Hypothesis does not deny the role of transfer in L2; instead, it aims to capture the incidences of selective or partial L1 transfer through a processing-based account.

Suppose that in native Turkish, besides the syntactic and semantic properties of the universal quantifier *her* (every), pragmatic constraints also affect the interaction of negation and a universal quantifier. Suppose further that it is primarily the scalar implicature (Grice, 1957, 1989) that guides the native Turkish speakers to choose one reading over the other in the target constructions. In this regard, let us consider the statements in (55) and (56).

(55) Her misafir balık ye-me-di.
every guest fish eat-NEG-PAST
'Every guest didn't eat fish.'

a. Inverse scope reading (*neg > every*)
It is not the case that every guest ate fish.

b. Surface scope reading (*every > neg*)
Every guest is such that s/he didn't eat fish.

(56) Defne her kitabı al-ma-dı.
Defne every book-ACC buy-NEG-PAST
'Defne didn't buy every book.'

a. Surface scope reading (*neg > every*)
It is not the case that Defne bought every book.

b. Inverse scope reading (*every > neg*)
Every book is such that it wasn't bought by Defne.

When interpreting the construction *her misafir balık yemedi*, listeners may favor the *neg > every* reading given in (55a) because of the involvement of scalar implicature (Grice, 1957, 1989). That is, they assume that a stronger expression such as *misafirlerin hiçbiri balık yemedi* ('none of the guests ate fish') would be more appropriate to use to express the "none" meaning rather than an informationally weaker expression such as *her misafir balık yemedi* ('every guest didn't eat fish'). Likewise, during the interpretation of the statement *Defne her kitabı almadı* ('Defne didn't buy every book'), listeners may entertain only the *neg > every* interpretation because they assume that there are strong alternatives such as *Defne kitapların hiçbirini almadı* ('Defne didn't buy any of the books') or *Defne hiçbir kitabı almadı* ('Defne bought none of the books') to convey the "none" meaning instead of a weak interpretation such as *Defne her kitabı almadı* ('Defne didn't buy every book').

Given these assumptions, the intermediate learners, who are at the outset of L2 acquisition, may have transferred the syntactic and semantic properties of the target constructions from their L1 to the L2 since their developing L2 system is ready to process them. However, they may not have yet transferred the pragmatic constraints of their native language since processing such constraints would lead to more complex computations and they have not yet developed the prerequisite processing procedures required to process such constraints in their L2 system. On the

other hand, the advanced L2 learners may have transferred all the properties (syntactic, semantic, and pragmatic) of the universal quantifier *her* from their native grammar to their L2, which results in their non-native-like behavior regarding interpretations of target constructions, possibly because they can process all the L1-based features of the target constructions within their L2 system.

If this reasoning is on the right track, it suggests that L1 transfer is indeed developmentally moderated and the transfer of sub-modules such as syntax, semantics, and pragmatics from L1 to L2 grammar may be dependent on the development of the L2 processing system. In other words, L2 learners may not transfer their L1 grammar in its entirety at the beginning of second language acquisition because of the limited processing resources in their L2. As they become more proficient in L2, the extent to which they are able to process the L1-based linguistics forms increases, and thus the L2 learners transfer more properties of their native language to the L2.

One additional piece of evidence in support of the DMTH comes from the finding that in the QP OBJECT condition, the intermediate L2 learners had a higher rate of acceptance of the target statements presented in inverse scope contexts compared to native speakers of both Turkish and English. Recall that both in Turkish and in English the inverse scope interpretation of such constructions is not attested, although it is syntactically available. Because the intermediate L2 learners have not yet acquired the necessary processing mechanisms to process their L1-based pragmatic constraints in their developing L2 system, they may rely on their L1 syntactic and semantic knowledge of the universal quantifier *her* to interpret the constructions with negation and object universal quantifier in English. Without the pragmatic constraints of their L1, the learners may entertain both scope readings of the target statements. In contrast, the advanced L2 learners' acceptance rate of the inverse scope reading in the QP OBJECT condition was similar to those of English and Turkish native speakers, which indicates that the L2 learners with the advanced proficiency carried over all the relevant properties of the universal quantifier *her*

(every), including its pragmatic constraints, from their L1 to their L2 as their L2 system is developmentally ready to process them.

I now turn to the on-line self-paced reading study designed to investigate how Turkish-speaking adult L2 learners of English process constructions with negation and universal quantifier in real time.

CHAPTER 4

ON-LINE STUDY

With the purpose of exploring how Turkish L2 learners of English with different proficiency levels (intermediate and advanced) process and interpret English constructions involving negation and a universal quantifier phrase in real time, an on-line self-paced reading experiment was carried out. A detailed description of the on-line study is provided below.

4.1. Participants

The participants of the experiment comprised two groups: 1) L2 learners of English, and 2) Native English speakers.

The L2 learner group was made up of 52 adult Turkish-speaking L2 learners of English aged between 17 and 28 (mean age: 22.02 (*SD*=2.01)). Of the 52 L2 learners, 23 were male and 29 were female. Twenty-seven of the participants were 4th grade undergraduate students at the Department of Foreign Language Education at METU, while twenty-five of them were preparatory class students at School of Foreign Languages at Hacettepe University. As one of the research questions of this thesis aims to find out whether or not L2 learners with different proficiency levels differ from each other in their interpretation of constructions with negation and universally quantified expression in English, the L2 learners were subdivided into two groups based on their general proficiency in English, as indicated by the scores on the Oxford Quick Placement Test (Allan, 1992), a standardized English proficiency test. In OQPT, 27 of the participants obtained scores between 48 and 54 (*M*=49.85, *SD*=2.10), and 25 of them scored between 30 and 39 (*M*=35.24, *SD*=3.29). This indicates that they were low-advanced and low-intermediate level L2

learners respectively according to the interpretation of the scores provided along with the test (See Appendix A for the interpretation table). As before, I will refer to the low-intermediate participants as *intermediate* and to the low-advanced participants as *advanced* for simplicity. In order to find out whether the difference between the OQPT scores of two groups is significant, an independent-samples t-test was conducted. The results confirmed that the two groups are different from each other in terms of their OQPT scores, $t(50) = 19.19$, $p<.001$. L2 participants were given course credit for their participation.

The native English speaker group consisted of 29 participants (female=16; male=13) with an average age of 30.23 (*SD*=4.30). The oldest participant was 42 years old, while the youngest one was 25. The majority of the participants (*n*=20) were from the United States; however, there were also participants from Australia (*n*=3), Canada (*n*=4), and Great Britain (*n*=2). Following the completion of the experiment, the participants were given gift cards for their contribution to the study.

4.2 Instruments

In order to explore how L2 learners of English process and interpret constructions involving a universally quantified phrase and negation, a self-paced reading task (SPRT) with a noncumulative linear display (Just, Carpenter, & Wooley, 1982), in which the respondents' reading times (RTs) were measured for each word of the target constructions, was designed. The SPRT was chosen as a method of investigation of the participants' processing of target sentences for two reasons. First, the implicit knowledge of grammar can be tested relatively more accurately through an on-line rather than an off-line instrument because under time pressure, L2 learners are less likely to draw on their explicit knowledge of grammar to answer the questions (Jegerski, 2014; Jiang, 2012). Second, SPRT provides information on the processing behavior of the participants through reading time effects which may signal a reanalysis in syntax, or an additional processing difficulty (Jegerski, 2014; Papadopoulou, 2005).

In the SPRT, similar to the off-line study, participants were presented with target statements following a situation which favored either the surface or the inverse scope reading of the statement. The respondents first read a situation which was displayed as a single chunk in the middle of the screen. Then, a target statement describing the situation given was presented as a series of dashes on the screen. Behind each of the dashes was a word. The target statement appeared in a word-by-word fashion: Every time participants pressed the space bar (which they did at their own pace), a masked word was revealed, and the previous word was remasked. The participants were also presented with an end-of-trial truth-value judgment task: Immediately after the participants read the last word of the target statement, they were asked to decide whether or not the target statement was true or false in the given situation. The participants gave their answers by pressing a designated key on the keyboard (D-true, K-false). The purpose of this task was to ensure that the participants were engaged with the task, and to check their comprehension of the statements. Furthermore, the judgments of truth and falsity provided an additional measure of the participants' scope interpretations. In the task, all of the items appeared in black letters on a papaya-whip background in a pre-set 24-point font.

The experimental items employed in the English version of the CART were adapted to the SPRT by making two minor alterations. First, an adverbial phrase was added to the end of the target statement so as to ensure that the critical region involving universally quantified object NPs is not in the final position of the target statement since it is well-documented that the reading times for the last region of a statement reflects not the actual reading behavior, but the later stages of comprehension (Jackson, 2008; Jiang, 2012). Secondly, the contexts presented with the target statements were shortened in length to decrease the load of information on participants' working memory. However, it was ensured that the bias of the contexts was not changed.

After the test items were modified, target sentences were divided into seven regions. In the QP SUBJECT condition, the division of statement into the regions

was as follows: the universal quantifier *every* (Region 1=R1), the subject NP (Region 2=R2), the negated auxiliary (Region 3=R3), the verb (Region 4=R4), the object NP (Region 5=R5), and a two-word adverbial phrase (Region 6=R6) and (Region 7=R7). The critical regions are the negated auxiliary (Region 3) and the verb (Region 4), and the post-critical regions are the object NP (Region 5) and the adverbial phrase (Region 6). A sample experimental item in the QP SUBJECT condition is illustrated in (57). The slashes in the examples demonstrate how the target statements were broken into the segments.

(57) Universal Quantifier in Subject Position

a. Surface Scope Reading (*neg* > *every*)

Last night, Joe cooked fish for his three guests. However, one of his guests didn't eat the fish because of her allergies. So, Joe ordered pizza for her.

b. Inverse Scope Reading (*every* > *neg*)

Last night, Joe cooked fish for his three guests. However, when he was away from the kitchen, his cat ate all the fish. So, he ordered pizza for his guests instead.

Experimental Sentence:

Every/	guest/	didn't/	eat/	fish/	last/	night./
R1	R2	R3	R4	R5	R6	R7

In the QP OBJECT condition, the division of target statement into regions was as follows: the subject NP (Region 1=R1), the negated auxiliary, (Region 2=R2), the verb (Region 3=R3), the universal quantifier *every* (Region 4=R4), the object NP (Region 5=R5), and a two-word adverbial phrase (Region 6=R6) and (Region 7=R7). The critical region is the object NP (Region 5), and the post-critical region is the adverbial phrase (Region 6).[2] A representative test item is shown in (58).

(58) Universal Quantifier in Object Position

[2] Region 7 is not considered as a post-critical region due to possible wrap-up effects (Jegerski, 2014; Gibson, Desmet, Grodner, Watson, & Ko, 2005; Jackson, 2008).

a. Surface Scope Reading (*neg* > *every*)

   Last weekend, Mike wanted to clean the four dirty rooms in his house. However, after he cleaned two of the rooms, his friends showed up. So, he gave up cleaning the other rooms.

b. Inverse Scope Reading (*every* > *neg*)

   Last weekend, Mike wanted to clean the four dirty rooms in his house. But then he realized that the water had been cut off. So, he gave up cleaning the rooms.

   Experimental Sentence:

Mike/	didn't/	clean/	every/	room/	last/	weekend./
R1	R2	R3	R4	R5	R6	R7

In addition to the 16 experimental items, 20 filler items, which were previously used in the English version of the CART, were modified in the same way and included into the SPRT. The target sentences in filler items consisted of 3 ambiguous sentences, which exhibited different types of ambiguity from the experimental items, and 17 unambiguous sentences presented with contexts. The 17 unambiguous sentences included 6 sentences containing only negation, 4 sentences with only an existential quantifier, 3 sentences containing neither negation nor a universal quantifier, and 4 sentences involving only a universal quantifier. The number of True/False responses to 18 unambiguous filler items such as (60) was balanced so that the participants cannot easily recognize the filler items. An example set of filler items is given below.

(59) <u>Ambiguous Filler Item with a Context</u>

Last Tuesday, five students got angry at their teachers and decided to paint their cars. However, they didn't paint red cars. They just painted white cars.

Sentence:

Every/	student/	painted/	a/	car/	last/	Tuesday./
R1	R2	R3	R4	R5	R6	R7

(60) Unambiguous Filler Item with a Context

Yesterday, Susan wanted to invite her six friends for dinner. However, she called only three of them because she didn't have the others' phone numbers.

Sentence:

Susan/	called/	none/	of/	her/	friends/	yesterday./
R1	R2	R3	R4	R5	R6	R7

Two presentation lists were created out of 16 sets of experimental items so that each participant reads each target statement only once in only one kind of biasing context. The experimental items were then interleaved with 20 fillers. Within each presentation list, the experimental and filler items were randomized. After randomization, the presentation lists were checked to make sure that two identical test items do not appear in succession. A full set of experimental items along with the fillers can be found in Appendix E.

The experiment was designed and administered employing Alex Drummond's IBEX platform (http://spellout.net/ibexfarm/), a web-based tool for running and hosting psycholinguistic experiments. This way, the SPRT could be administered to participants without constraints of time and place.

4.3. Procedure

To divide the L2 learner group into two groups based on their general proficiency in English, the OQPT was administered first. The time allocated for the OQPT was 30 minutes. Next, L2 learners were sent an email with the link to the experiment and asked to take part in it. Native speakers of English were requested to participate in the study through email. The completion of the experiment took approximately 20 minutes. Prior to the actual experiment, the participants were given specific instructions (see Appendix F) and were exposed to three practice items to become familiar with the procedure of the SPRT.

4.4. Data Analysis

The data collected in the SPRT experiment were analyzed in five steps. In the first step, the participants' accuracy rates on the 17 unambiguous filler items were checked to ensure that the respondents devoted enough attention to the task itself. The mean comprehension accuracy calculated from the filler items was 86.25% (*SD*= 2.36), ranging from 81.75% to 96.50%. The average accuracy rate did not differ significantly across the two lists, $p>.05$.

The second step included data trimming: the process of excluding outliers in the analysis to increase the power of parametric tests to be conducted on the data. In order to identify the outliers, an absolute cut-off method was employed. Since reading times of less than 100 ms (per region) are generally assumed not to reflect real reading behavior (Luce, 1986; Jegerski, 2014), the low cut-off point was established at 100 ms. The high cut-off point was set at 3000 ms for all the participants as reading times above 3000 ms are likely to arise from external factors such as the loss of concentration (Roberts & Felser, 2011). The reading times less than 100 ms or greater than 3000 ms were eliminated from the data. The elimination of those data points resulted in the loss of 2.5% of L2 learner data and 1.5% of the English native speaker data. After the outliers were removed from the data set, the missing values were replaced with the mean RT in the relevant region in each condition per participant. That is, a missing value in a participant's RT was replaced by the same participant's mean RT in that condition in that region.

After data trimming, all raw reading times were logged to normalize the data because RT data tend to be positively skewed (Marinis, 2010). After the log transformations, aggregate means were calculated and the parametric tests were performed on the aggregated means.

As a forth step, the mean reading times and standard deviation values obtained from three groups of participants (advanced L2 learners, intermediate L2 learners, and native speakers of English) were calculated through descriptive statistical analyses. In order to determine whether or not each participant group's

reading times differed significantly across the experimental conditions (surface vs. inverse scope) at each region of interest, paired samples t-tests were run on the data for critical and post-critical regions. To find out whether or not the three participant groups' reading times differed across the experimental conditions at each region of interest, repeated-measures ANOVAs with bias of the context (surface scope *vs* inverse scope) as a within-subject factor and group (advanced L2 learners, intermediate L2 learners, and native speakers of English) as a between-subjects factor were carried out for each of the regions of interest. Based on the results obtained in repeated-measures ANOVAs, subsequent analyses were undertaken through one-way ANOVAs.

Regarding the end-of-trial truth-value judgment task, the mean percentages of TRUE responses for both surface scope and inverse scope readings were included in the analysis (because when the respondents pressed the key designated for *False*, that does not necessarily mean that they accessed the alternative scope interpretation). To find out whether each group's mean percentages of TRUE responses differed significantly between two scope interpretations, paired samples t-tests were run on the data. To compare the three groups in terms of their mean percentage of TRUE responses for surface and inverse scope readings, one-way ANOVAs with group (intermediate L2 learners of English, advanced L2 learners of English, and English native speakers) as a between-participant factor, and the bias of the context (surface *vs* inverse) as a within-participant factor was performed on the mean percentages of TRUE responses of the participants. The Tukey-HSD tests were also used for multiple comparisons**.**

4.5. Results

4.5.1. Native Speakers of English

4.5.1.1. Results of the Truth-Value Judgment Task

Mean percentages of TRUE responses to the target statements presented with a context creating either the surface or the inverse scope bias were computed. These are presented in Table 5.

Table 5. *English Native Speakers' Mean Percentages (%) of TRUE Responses (n=29)*

Bias of the Context	QP SUBJECT Condition Mean Percentage (SD)	QP OBJECT Condition Mean Percentage (SD)
Surface	90.51 (14.03)	98.27 (6.44)
Inverse	37.93 (39.31)	87.93 (25.54)

To see whether the two conditions (surface *vs* inverse scope) differ in the mean percentages of TRUE responses, a paired samples t-test was run on the data. The findings indicated that in the QP SUBJECT condition, there was a statistically significant difference between the participants' mean percentages of TRUE responses in the surface scope (M=90.51, SD=14.03) and the inverse scope (M=37.93, SD=39.31) contexts, $t(28)=7.129$, $p<.001$. Similarly, in the QP OBJECT condition, the participants' gave significantly more TRUE responses to the statements following the surface scope contexts (M=98.27, SD=6.44) than following the inverse scope contexts (M=87.93, SD=25.54), $t(28)=2.33$, $p=.026$. In other words, in the QP SUBJECT condition, English native speakers judged the target statements presented in surface scope contexts as true more often than those presented in inverse scope contexts. Likewise, in the QP OBJECT condition, the percentage of TRUE responses provided for the target statements in surface scope contexts was

significantly higher than in inverse scope contexts. The English native speakers thus exhibited a preference for accepting the statements in surface scope contexts when interpreting constructions with negation and either an object or a subject QP.

4.5.1.2. Reading Times

In order to have a baseline for the native processing of target constructions and to be able to identify potential differences between the native and non-native processing of scopally ambiguous sentences, the L1 English speakers' reading times of the target statements were measured. Table 6 shows the English native speakers' raw mean reading times of the seven regions of the target statements in the QP SUBJECT condition. The statistical tests were conducted on the logged mean reading times.

Table 6. *The Region-By-Region Raw Mean Reading Times (in Milliseconds) of English Native Speakers-QP SUBJECT Condition (n=29)*

Bias of the Context	R1	R2	R3	R4	R5	R6	R7
Surface	386	373	405	405	481	457	888
Inverse	418	400	422	462	522	569	838

($Every_{1,}$Subject $NP_{2,}$ Negated $Auxiliary_{3,}$ $Verb_{4,}$ Object $NP_{5,}$ Adverbial $Phrase_{6-7}$)

Comparisons across different scope biases were calculated only for critical and post-critical regions. Paired-samples t-test comparisons showed that there were no significant differences in the participants' readings times in the first critical region (Region 3, containing the negated auxiliary) across the surface and inverse scope contexts. However, significant differences in readings times emerged in the other critical region, Region 4, ($t(28)=-3.870$, $p=.001$), and in one of the post-critical regions, Region 6, ($t(28)=-2.292$, $p=.030$), showing that the mean reading times of

the target statements in surface scope contexts were significantly shorter than those in inverse scope contexts. That is, the group of English native speakers exhibited longer reading times on the inverse scope interpretation of target statements than on their surface scope interpretation in Region 4 and 6.[3]

Table 7 presents the native English speakers' raw mean reading times of the seven regions of the target statements in the QP OBJECT condition.

Table 7. *The Region-By-Region Raw Mean Reading Times (in Milliseconds) of English Native Speakers-QP OBJECT Condition (n=29)*

Bias of the Context	R1	R2	R3	R4	R5	R6	R7
Surface	382	348	371	395	404	395	777
Inverse	374	360	374	431	468	529	954

(Subject NP_1, Negated $Auxiliary_2$, $Verb_3$, $Every_4$, Object NP_5, Adverbial $Phrase_{6-7}$)

A paired samples t-test revealed that the mean reading times of target sentences presented in surface and inverse scope contexts did not differ significantly in the critical region (Region 5), $p > .05$. However, a significant difference was found in the post-critical region, Region 6, $t(28)=-2.876$, $p<.001$. The participants read this region faster in the surface scope than in the inverse scope, indicating that the processing of inverse scope between negation and a universally quantified object was more difficult than the processing of the surface scope.[4]

The reading times of the native English speakers in both conditions (QP SUBJECT and QP OBJECT) are summarized in Figure 3 and Figure 4.

[3] Significant differences were also found in Region 1, $t(28)=-2.453$, $p=.021$, and in Region 2, $t(28)=-3.183$, $p=.045$. However, they were not included in the results since those regions do not reflect the processing of the interaction between quantifier and negation.

[4] A significant difference was also found in Region 7, $t(28)=-2.946$, $p=.002$, but the increased reading times in this region may have been suggestive of the wrap-up effects, rather than the difficulty of accessing a particular reading.

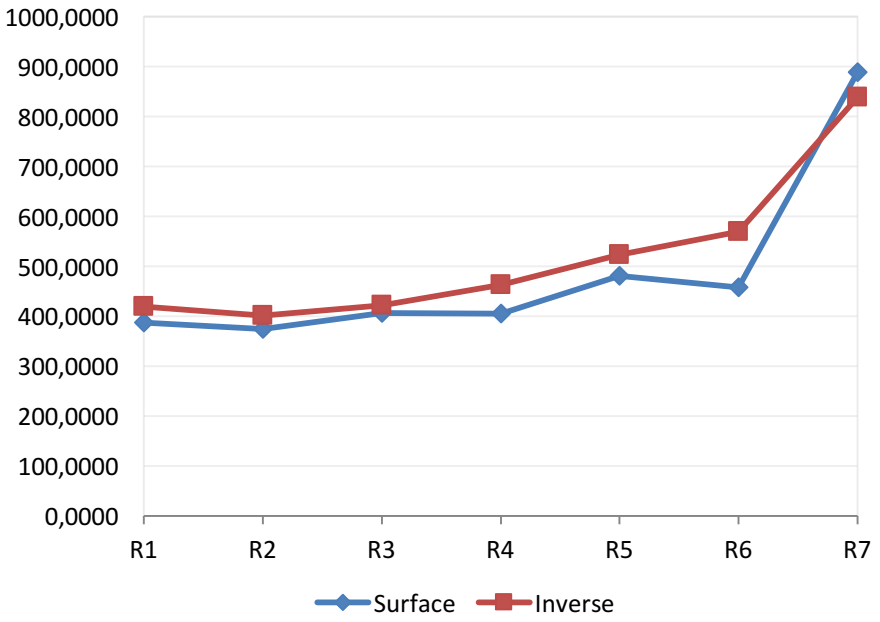
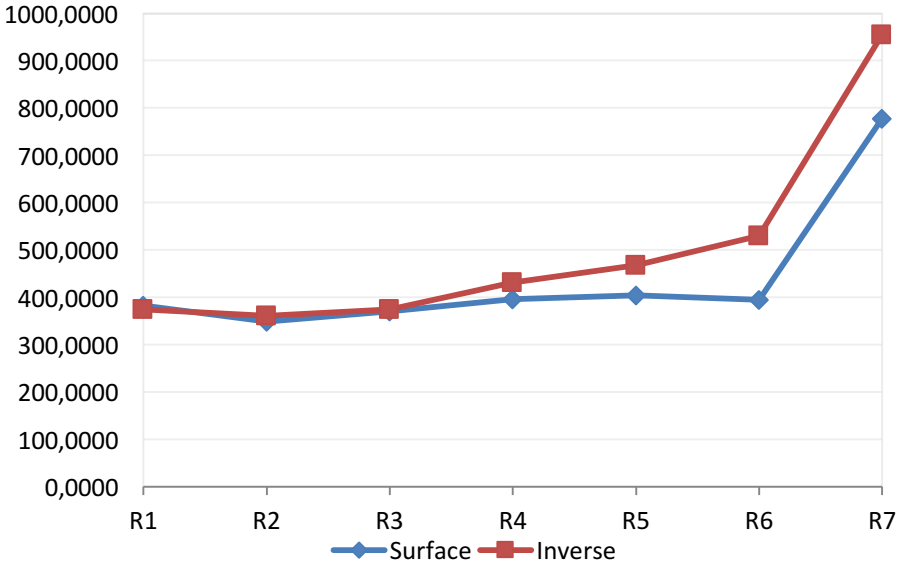


Figure 3. *English Native Speakers-QP SUBJECT Condition*



Note: The graphs are based on raw reading times.

Figure 4. *English Native Speakers-QP OBJECT Condition*

4.5.2. L2 Learners

4.5.2.1. Results of the truth-value judgment task

L2 learners' mean percentages of TRUE responses given for the target statements presented with contexts favoring surface or inverse scope interpretation are shown in Table 8.

Table 8. *The Descriptive Statistics of the Intermediate and Advanced L2 Learners' Mean Percentages of TRUE Responses to the Test Items*

Conditions	The Bias of the Contexts	Intermediate L2 Learners (*n*=25) Mean Percentage (SD)	Advanced L2 Learners (*n*=27) Mean Percentage (SD)
QP SUBJECT	Surface	78 (25.33)	75 (33.96)
	Inverse	69 (36.28)	85.18 (25.24)
QP OBJECT	Surface	92 (13.91)	99.07 (4.81)
	Inverse	72 (37.72)	69.44 (41.25)

For each of the two conditions (QP SUBJECT, QP OBJECT), the percentage of TRUE responses was compared across contexts with different biases (surface *vs* inverse scope). This was done separately for each L2 group. Neither of the L2 learner groups showed a preference for a particular interpretation of the target sentence (surface *vs* inverse scope) in the QP SUBJECT condition. However, in the QP OBJECT condition, both groups displayed a tendency to accept the target statements presented in the surface scope contexts to a significantly greater extent than in the inverse scope context.

For the intermediate L2 learners' group, in the QP SUBJECT condition, there was no significant difference between the mean percentages of TRUE responses to target statements in the surface (*M*=78, *SD*=25.33) and inverse scope contexts

(*M*=69, *SD*=36.28), *t*(24)=.866, *p*>.05. In the QP OBJECT condition, the intermediate participants exhibited a significantly lower acceptance rate of inverse scope reading (M=72, *SD*=37.72) than of surface scope reading (*M*=92, *SD*=13.91), *t*(24)=2.376, *p*=.026.

The advanced L2 learners' mean percentages of TRUE responses to the statements in surface (*M*=75, *SD*=33.96) and inverse (*M*=85.18, *SD*=25.24) scope contexts in the QP SUBJECT condition did not differ significantly either, *t*(26)=-1.218, *p*>.05. The participants, however, accepted the surface scope interpretation of the target constructions (*M*=99.07, *SD*=4.81) significantly more often than their inverse scope interpretation (*M*=69.44, *SD*=41.25), *t*(26)=3.649, *p*=.001, in the QP OBJECT condition.

4.5.2.2. Reading Times

Table 9 presents the raw mean reading times of the seven regions of the target statements in the QP SUBJECT by L2 participants. The statistical tests were run on the logged mean reading times.

Table 9. *The Region-By-Region Raw Mean Reading Times (in Milliseconds) of the L2 Learners-QP SUBJECT Condition*

	Bias of the Contexts	R1	R2	R3	R4	R5	R6	R7
Intermediate L2 Learners (*n*=25)	Surface	397	398	433	478	525	525	1112
	Inverse	418	418	439	444	484	472	860
Advanced L2 Learners (*n*=27)	Surface	414	426	474	568	589	586	798
	Inverse	441	460	509	630	624	523	1055

(Every$_{1,}$Subject NP$_{2,}$ Negated Auxiliary$_{3,}$ Verb$_{4,}$ Object NP$_{5,}$ Adverbial Phrase$_{6\text{-}7}$)

For each group, reading times were compared across surface and inverse biased contexts by region. In the intermediate learners' group, the significant difference between the reading times in surface and inverse scope contexts was found in Region 7, which was read significantly more slowly in surface scope contexts than in inverse scope contexts, $t(24)=2.257$, $p=.030$. No significant differences emerged in any other region.

Region 7 was the only region in which the reading times of the advanced L2 learners differed significantly across contexts, as well. This group, however, produced significantly longer reading times in this region for the statements presented in inverse scope contexts than for those presented in surface scope contexts, $t(26)=3.791$, $p=.001$. In addition, in Region 4, the second critical region, the difference between the mean reading times of the target statements presented in surface and inverse scope contexts was approaching significance, $t(26)=-1.984$, $p=.056$, indicating processing difficulties in the inverse scope contexts.

Turning now to the QP OBJECT condition, Table 10 shows the L2 learners' raw mean reading times of the seven regions of the constructions in this condition.

Table 10. *The Region-By-Region Raw Mean Reading Times (in Milliseconds) of the L2 Learners- QP OBJECT Condition*

	Bias of the Contexts	R1	R2	R3	R4	R5	R6	R7
Intermediate L2 Learners (n=25)	Surface	413	418	429	453	449	462	964
	Inverse	388	402	380	452	507	514	959
Advanced L2 learners (n=27)	Surface	443	415	446	444	499	457	819
	Inverse	423	409	390	433	573	560	917

(Subject $NP_{1,}$ Negated $Auxiliary_{2,}$ $Verb_{3,}$ $Every_{4,}$ Object $NP_{5,}$ Adverbial $Phrase_{6-7}$)

In the intermediate learners' group, a significant difference was found only in Region 3 (the pre-critical region), where the participants demonstrated shorter reading times in the contexts favoring the inverse scope reading than in those favoring the surface scope reading ($t(24)=2.357$, $p=.027$).

For the advanced learners, the difference between the reading times of the target statements presented in surface scope and inverse scope contexts approached significance in Region 5 (the critical region) and Region 6 (the post-critical region). In those regions, the reading times of the target constructions in inverse scope contexts were longer than those of the target statements in surface scope contexts at an almost significant level, $t(26)=-1.802$, $p=.058$ for Region 5, $t(26)=-1.966$, $p=.052$ for Region 6.

However, both groups of L2 learners manifested different behavior in their processing of the target constructions in QP OBJECT condition: the intermediate learners produced longer reading times in the pre-critical region, Region 3, for the statements presented in surface scope contexts than those in inverse scope contexts, whereas the advanced learners demonstrated longer reading times, almost at a significant level, in the critical (Region 5) and the post-critical (Region 6) regions for the statements in inverse scope contexts than those in surface scope contexts.

The reading times of the intermediate and advanced L2 learners in both conditions (QP SUBJECT and QP OBJECT) are summarized in Figures 5 through 8.

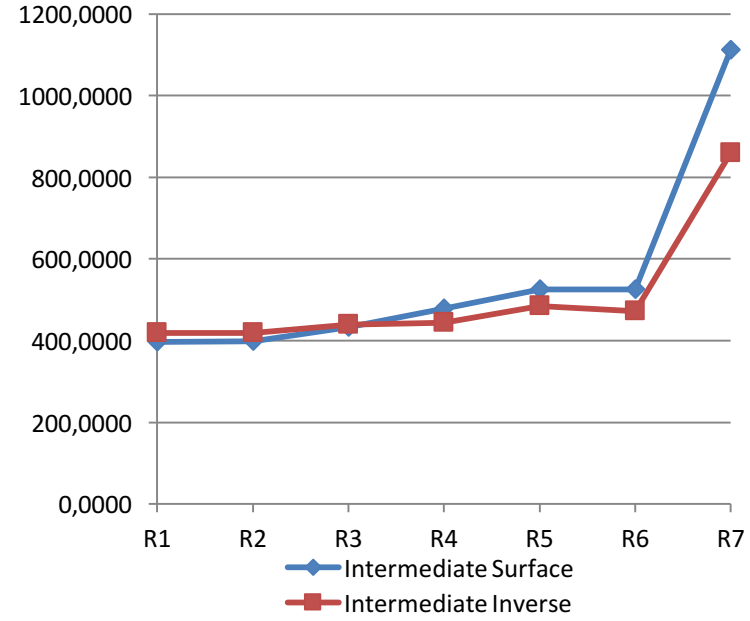
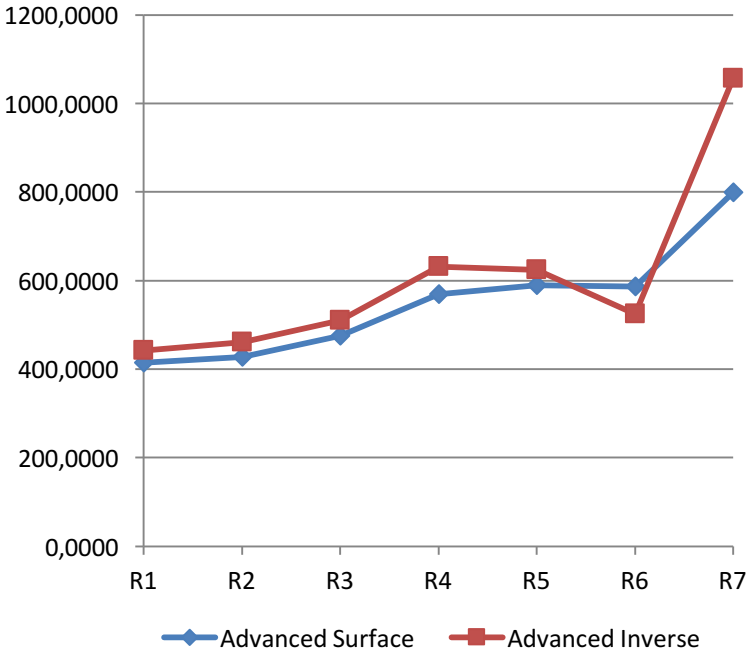


Figure 5. *Intermediate L2 Learners- QP SUBJECT Condition*



Note: The graphs are based on raw reading times.

Figure 6. *Advanced L2 Learners-QP SUBJECT Condition*

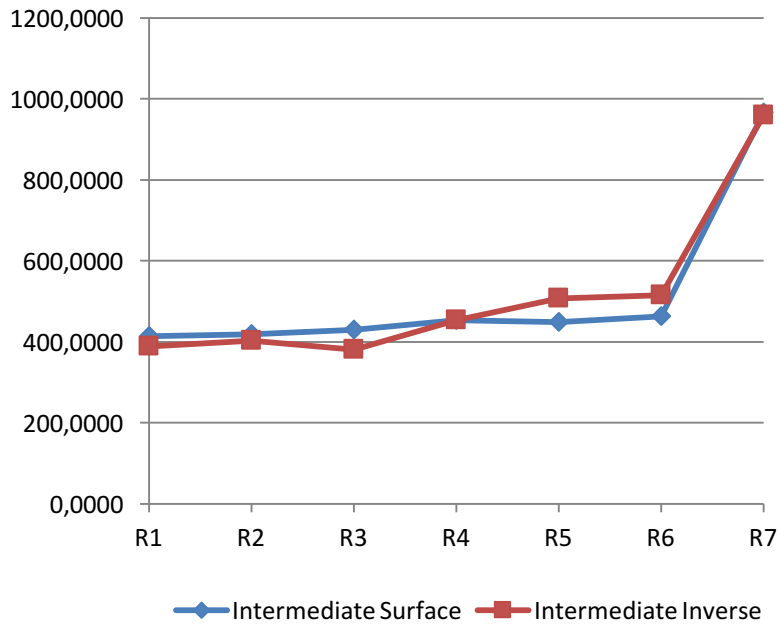
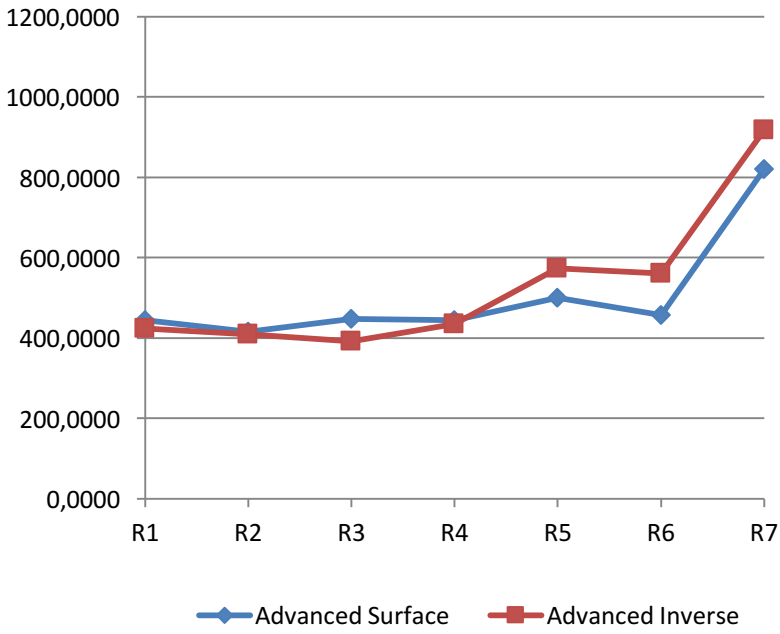


Figure 7. *Intermediate L2 Learners-QP OBJECT Condition*



Note: The graphs are based on raw reading times.

Figure 8. *Advanced L2 Learners-QP OBJECT Condition*

4.5.3. The Comparisons of the Proportions of TRUE Responses and the Reading Times across All Groups

4.5.3.1. The Proportion of TRUE Responses

Figures 9 and 10 summarize the mean percentages of TRUE responses of all three groups in the QP SUBJECT and QP OBJECT conditions.

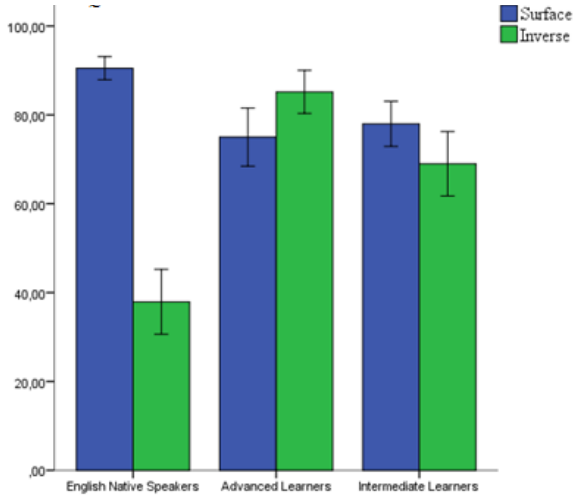


Figure 9. *Mean Percentage of TRUE Responses in QP SUBJECT Condition*

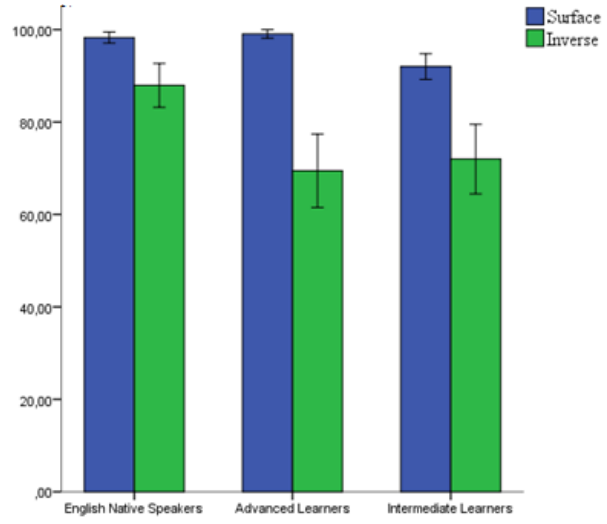


Figure 10. *Mean Percentage of TRUE Responses in QP OBJECT Condition*

In order to determine whether or not the intermediate and the advanced L2 learners of English differ from the English native speakers in their judgments of the target constructions, one-way ANOVAs with group (intermediate L2 learners of English, advanced L2 learners of English, and English native speakers) as a factor were carried out on the mean percentages of TRUE responses for each condition (QP SUBJECT and QP OBJECT). In the QP SUBJECT condition, there was a statistically significant difference among the three groups in their mean percentages of TRUE responses in the inverse scope contexts, [$F(2,78)=13.82$, $p<.001$], whereas no significant difference was found among three groups in the surface scope contexts, [$F(2,78)=2.91$, $p=.060$]. The Tukey HSD post-hoc test indicated that both the intermediate and the advanced learners' mean percentages of TRUE responses in inverse scope contexts (M=69, SD=36.28; M=85.18, SD=25.24 respectively) differed significantly from that of English native speakers (M=37.93, SD=39.31). These results suggest that both groups of L2 learners displayed native-like judgments in their interpretation of the constructions in surface scope contexts, whereas they did not perform like native speakers when interpreting statements in inverse scope contexts. Unlike the English native speakers, the L2 learner group had a strong tendency to accept the target statements presented with contexts biasing the inverse scope interpretation.

In the QP OBJECT condition, a significant difference was found among the three groups in their mean percentages of TRUE responses to the statements in surface scope contexts, [$F(2,78) = 4.71$, $p=.012$], while there was no main effect of group on the mean percentages of TRUE responses given for the constructions in inverse scope contexts, [$F(2,78)=2.73$, $p>.05$]. The Tukey HSD post-hoc test revealed that the intermediate learners (M=92, SD=13.91) differed significantly from both advanced learners (M=99.07, SD=4.81) and English native speakers (M=98.27, SD=6.44) in their reactions to statements presented with contexts supporting the surface scope reading. That is to say, as opposed to the advanced learners and native speakers of English, the learners with intermediate proficiency

were more likely to judge the statements in surface scope contexts as true, whereas both L2 groups exhibited a pattern similar to that of English native speakers in their acceptance of the target statements presented in inverse scope contexts.

4.5.3.2. Reading Times

With the purpose of finding out if the intermediate and advanced L2 learners of English differ from the native speakers of English in their processing of the constructions involving negation and a universally quantified expression in either subject or object position, repeated-measures ANOVAs with Context (surface scope, inverse scope) as a within-subject factor and Group (intermediate L2 learners of English, advanced L2 learners of English, and English native speakers) as a between-subjects factor were run for each region. The results revealed that in the QP SUBJECT condition, there was no significant interaction between Context and Group in any region except for Region 4, all p's>.05. In Region 4, the second critical region, containing the verb, the interaction between Context and Group was approaching significance, [$F(2,78)=2.998$, $p=.056$]. To identify the sources of the interactions in Region 4, a one-way ANOVA with Group as a factor was run on the participants' mean reading times of the statements presented with contexts supporting the surface and inverse scope interpretation. The findings revealed that in Region 4, there was a significant difference among the three groups in their reading times of the target statements presented with surface scope contexts, [$F(2,78)=3.759$, $p=.028$], and with inverse scope contexts [$F(2,78)=5.915$, $p=.004$]. The Tukey HSD test showed that the advanced L2 learners' reading times of the statements in surface scope contexts ($M=2.68$, $SD=.16$) differed significantly from those of English native speakers ($M=2.58$, $SD=.12$). In addition, in inverse scope contexts, the reading times of the advanced learners ($M=2.73$, $SD=.16$) were found to be significantly longer than the reading times of the native speakers of English ($M=2.63$, $SD=.11$) and the intermediate learners ($M=2.64$, $SD=.06$) for the target statements. Thus, at the second critical region, the advanced learners produced longer reading times than the English

native speakers in the target constructions presented with contexts favoring the surface scope, and they manifested processing behaviors different from the English native speakers and the intermediate learners in the target statements presented with inverse scope contexts.

In the QP OBJECT condition, the results indicated no significant interactions between Contexts and Groups in all regions, all p's>.05. That is to say, the English native speakers and the L2 learner group displayed similar processing behavior in self-paced reading of the constructions with negation and object universal quantifier phrase.

4.6. Discussion

In order to examine how Turkish L2 learners of English with two different proficiency levels (intermediate and advanced) interpret English sentences containing a universally quantified expression and negation in real time, an on-line SPRT accompanied by an end-of-trial truth-value judgment task was carried out.

The results revealed that in both conditions (QP SUBJECT and QP OBJECT) the English native speakers produced longer reading times for the constructions presented in inverse scope contexts than for those presented in surface scope contexts, which is in line with the results of the studies undertaken by Anderson (2004), Kurtzman and MacDonald (1993), Pylkkänen and McElree (2006), Tunstall (1998), and Dotlačil and Brasoveanu (2015). Specifically, the findings showed that in the QP SUBJECT condition, the native speakers of English read the second critical region (Region 4, containing the verb) and the second post-critical region (Region 6, containing the first part of the adverbial expression) of the target constructions presented in inverse scope contexts more slowly than those presented in surface scope contexts. Recall that in the QP SUBJECT condition, the region with negated auxiliary (Region 3) and the region with verb (Region 4) were taken as critical regions, and the region with object NP (Region 5) and the region with adverbial phrase (Region 6) were taken as post-critical regions. The results indicated

that the L1 English speakers have fewer difficulties while processing the target statements in surface scope contexts than in inverse scope contexts, which is compatible with the findings of the off-line study in which native speakers displayed a preference for the surface scope reading in this condition.

In the QP OBJECT condition, the native English speakers' reading times were similar for all the regions of the target constructions in surface and inverse scope contexts except for the last two regions (Region 6 and Region 7). Recall that in the QP OBJECT condition, the region with object NP (Region 5) was considered as a critical region, and the region with adverbial phrase (Region 6) was treated as a post-critical region. In the post-critical region (Region 6), the native speakers of English were found to demonstrate longer reading times for the statements presented in inverse scope contexts than for those presented in surface scope contexts. Assuming that prolonged reading times indicate processing difficulties, the English native speakers showed fewer processing difficulties in surface scope contexts than in inverse scope contexts, which is in tune with the results obtained in the off-line study.

The results confirm the Principle of Processing Scope Economy which was proposed by Anderson (2004) building on the Principle of Scope Economy (Tunstall, 1998). The Principle of Processing Scope Economy claims that the real-time comprehension of the constructions with scope ambiguity involves the computation of syntactic representations, and because the access to inverse scope reading requires post-syntactic changes in the syntactic representation through movements, the computation of inverse scope representations increases the load of the processor, and thus, the processing cost. Given the fact that in both conditions (QP SUBJECT and QP OBJECT) the inverse scope interpretation is obtained through covert movements at LF, it can be stated that the relatively long reading times observed in the native speakers' comprehension of the target constructions presented with inverse scope context indicates the increased processing cost.

The findings obtained from the end-of-trial truth-value judgment task indicated that in the QP SUBJECT condition, the native speakers of English judged the target statements presented in surface scope contexts as true more frequently than those presented in inverse scope contexts, which is compatible with the findings of the off-line study. Similarly, in the QP OBJECT condition, the native English speakers favored the surface scope reading over the inverse scope reading, as they did in the off-line study. These results indicate an internal consistency between the results of the off-line and the on-line study. What may be interesting, however, is the finding that in the QP OBJECT condition of the SPRT, the speakers with L1 English accepted the inverse scope readings of the target constructions at a relatively higher rate than they did in the off-line study. This finding runs counter to the account proposed by Aoun and Li (1993), who propose that a universally quantified object cannot raise to a position where it can c-command the negation. By contrast, native English speakers seem to be able to entertain not only the surface scope reading, but also the inverse scope reading in their processing of the target constructions with negation and an object QP. In terms of pragmatics, this is again an unexpected finding given the fact that in English, the surface scope interpretation of constructions such as *squirrels didn't pick up every nut* is preferred due to scalar implicature. In other words, based on the framework developed by Grice (1957, 1989), English native speakers would be expected to display a less strong preference for the inverse scope interpretation of such constructions since there are unambiguous alternative statements such as *squirrels picked up none of the nut or squirrels didn't pick up any of the* nuts to express the "none" meaning conveyed in the inverse scope interpretation. The English native speakers' relatively high rate of acceptance of the inverse scope interpretation is likely to stem from two reasons. First, the binary response scale employed in the end-of-trial truth-value judgment task may have led the subjects to choose a side rather than providing them with a chance to express their degree of certainty regarding the acceptability of the target constructions. As pointed out by Ionin & Zyzik (2014), the utilization of binary

judgments may prove to be useful when there are clear cut distinctions between the target constructions in terms of grammaticality. Considering the fact that the involvement of scalar implicature does not concern grammaticality but appropriateness, it is conceivable that the participants may have relied on their syntactic and semantic knowledge of the scope phenomenon in question to judge the acceptability of the target constructions. Because both surface and inverse scope interpretations are in principle syntactically and semantically available in English constructions containing negation and object universal quantifier, the English native speakers may have exhibited a tendency to accept the target constructions in both surface and inverse scope contexts. Second, the native English speakers' high rate of acceptance of the target constructions presented in inverse scope contexts may be indicative of the fact that the conversational implicature can be cancelled (Grice, 1989). Chierchia (2001, 2004, 2006) and Levinson (2000) propose that statements have a certain set of implicatures, which is automatically involved in the determination of the truth value of the statements. When there is a pronounced mismatch between the contexts in which the statements are introduced and the default implicature, the implicature is backtracked or cancelled. In other words, when the speakers fail to interpret a context with the default implicature of a target sentence, they may remove the implicature in an effort to obtain a more acceptable reading. Thus, in the case at hand, when interpreting constructions presented with contexts boosting the saliency of inverse scope reading, the speakers with L1-English may have eliminated the default implicature so as to meet the demands of the context under time pressure. Consequently, they may have accessed the inverse scope interpretation through syntactic and semantic operations. A similar finding was also found in an on-line study carried out by Lee (2009). Lee (2009) claims that in the presence of rich contextual support the native English speakers may find both the surface and the inverse scope readings of the target constructions ambiguous.

For the L2 learner group, the results indicated that the advanced L2 learners displayed native-like patterns in their processing of the target constructions in the QP

SUBJECT condition. More precisely, similar to the speakers with L1-English, the L2 learners with advanced proficiency demonstrated longer reading times for the constructions presented in inverse scope contexts than for those presented in surface scope contexts in the second critical region (Region 4).[5] These results accord with the findings of the research undertaken by Dekydtspotter and Outcalt (2005), Hopp (2006), Dussias (2003), Williams, Möbius and Kim (2001), Mitsugi and MacWhinney (2010), all of which found that the L2 learners with a high level of proficiency can process the target constructions in a native-like fashion. However, in Region 4, which is the critical region after the negated auxiliary, the advanced L2 learners were found to take longer to read the target statements in both surface and inverse scope contexts than English native speakers. Regarding the reasons of this slowdown, it is conceivable that the learners may have been less automatic in their computations of the target constructions than the native speakers possibly due to their limited processing resources in the L2 (Segalowitz, 2003; White & Juffs, 1998; Juffs, 2001; Clahsen & Felser, 2006; Fernández, 2003; Hahne, 2001; Hahne & Friederici, 2001; Marinis, Roberts, Felser, & Clahsen, 2005). As highlighted by Clahsen and Felser (2006), the processing of L2 structures requires more effort than that of L1 structures. In other words, L2 learners need to expend relatively more effort in the comprehension of L2 input than in the comprehension of L1 input since they have restricted computational resources at their disposal.

Likewise, in the QP OBJECT condition, the advanced L2 learners were found to be similar to the native speakers of English in their reading times. That is, in the critical region (Region 5) and the post-critical region (Region 6), the learners with high proficiency produced longer reading times, almost at a significant level, for the target statements in inverse scope contexts than for those in surface scope contexts, which parallels the pattern observed in the reading times of the English native speakers. Given the fact that Turkish and English behave similarly in terms of the

[5] A significant difference was also found in Region 7, however the increased reading times in this region may be suggestive of possible wrap-up effects.

interpretation of the constructions with negation and an object universal quantifier, it is reasonable to argue that the transfer of the L1 processing strategies may have enabled the advanced learners to demonstrate reading times similar to those of the English native speakers.

Regarding the advanced L2 learners' truth-value judgment rates in the QP SUBJECT condition, the findings showed that the advanced L2 learners were similar to the native English speakers in their acceptance rate of the target statements presented in surface scope contexts. However, they differed from the English native speakers in their acceptance rate of the target constructions presented in inverse scope contexts. The finding that the L2 learners with advanced proficiency accepted the target constructions presented in surface and inverse scope contexts at similar rates is inconsistent with the results obtained in the off-line study. Recall that in off-line study the advanced L2 learners were found to exhibit a clear preference for inverse scope interpretation of the target statements in the QP SUBJECT condition. One possible way of accounting for the advanced L2 learners' relatively high rate of the acceptance of the constructions presented in surface scope contexts in the on-line experiment is that the learners may be well aware of the ambiguity present in the target constructions, and they may have been in the process of expanding their current grammar with one more interpretation. That is to say, in line with the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987), the L2 learners with advanced proficiency may have added an extra interpretation (the surface scope reading) to the grammar at their disposal through positive evidence available in the input. Another possibility is that the advanced L2 learners may have displayed a tendency to accept the target constructions presented in surface scope contexts because of the binary nature of the task. In other words, they may have tended to accept the target constructions rather than rejecting them since they were indecisive about their truth value conditions.

As for the advanced L2 learners' strong tendency to accept the target statements in inverse scope contexts, the results indicate the transfer of L1

interpretive preferences. Recall that in native Turkish the inverse scope reading is preferred over the surface scope reading in the interpretation of the statements containing negation and subject universal quantifier phrase. Thus, the learners' L1 knowledge of scope may have exerted an influence on their interpretations of the constructions presented in inverse scope contexts.

On the other hand, in the QP OBJECT condition, the advanced L2 learners' interpretive preferences were similar to those of adult speakers of English, which is consonant with the results of off-line study. The finding that, like English native speakers, the advanced L2 learners tended to accept the target constructions presented in inverse scope contexts relatively more than they did in the off-line study also reinforces the explanations provided above concerning the English native speakers' scope interpretations. Namely, the high acceptance rate of the inverse scope reading may result from either the binary nature of the truth-value judgment task, or scalar implicature's cancellability. Assume that in native Turkish, pragmatic constraints along with the syntactic and semantic properties of *her* (every) play a role in the interpretation of the constructions with negation and QP in the object position. Assume further that it is the scalar implicature (Grice, 1989) that primarily governs the native speakers' interpretations of the target statements in native Turkish, similar to native English. For instance, in both languages a statement like *Ted didn't feed every bird* is mostly used to convey the "not all" meaning, not the "none" meaning, since there are stronger alternative expressions to convey the "none" meaning, such as *Ted fed none of the birds*, or T*ed didn't feed any of the birds* than the structure *Ted didn't feed every bird.* Thus, it is possible that the advanced learners may have transferred the L1-based syntactic, semantic, and pragmatic features of the target structures to the L2, but the scalar implicature may have been cancelled possibly because of the time pressure involved in the on-line task. In other words, like the native English speakers, the advanced learners may have disregarded the default implicature in an effort to fulfill the demands of the context under time pressure.

Turning to the intermediate L2 learners, the findings indicated that in the QP SUBJECT condition, there were no significant differences between the intermediate learners' reading times of the target statements presented in surface and inverse scope contexts in any except for the final region. In other words, the reading times suggested that, unlike the native speakers of English and advanced L2 learners, for the intermediate L2 learners, there was no difference in processing the target constructions in surface and inverse scope contexts.[6] Similarly, in the QP OBJECT condition, the results showed no significant differences in intermediate L2 learners' reading times between the target statements presented in surface and inverse scope contexts, contrary to the results obtained from the advanced L2 learners and native speakers of English. Taken together, these results suggest that the L2 learners with low proficiency may have developed a pressing strategy, a strategy of pressing the spacebar quickly to read the words apace, in the interpretation of the target structures. Thus, they may have failed to exhibit native-like processing patterns in their comprehension of the target constructions. A similar finding was also reported by Dekydtspotter and Outcalt (2005), who argue that the flat pattern observed in the processing behavior of the L2 learners with low proficiency may result from a failure in L2 parsing. The researchers maintain that the flow of the relations in the processor determines the resolution of scope ambiguity. That is, when the flow of information is smooth, L2 learners may make use of all available information in their parsing of the L2 input. By contrast, when the flow of information is inconsistent, they may fail to use the information available in the parsing of L2 input. Dekydtspotter and Outcalt (2005) claim that such a failure in L2 parsing may remove "the constraining power of syntax", and thus L2 learners may process the target constructions without the restrictions imposed by the syntax (p.28). Assuming that this line of reasoning is

[6] The finding that in the final region, the learners produced significantly longer reading times for the statements presented in inverse cope contexts than for those presented in surface scope contexts may be indicative of a wrap-up effect, rather than a processing difficulty as Jegerski (2014) points out that the increase in reading times in the final regions of a target sentence may reflect the later stages of comprehension.

correct, the intermediate L2 learners may have experienced a failure in parsing, which eliminates the limitations of the syntax on their interpretations in the processing of the target constructions. Consequently, they may have read the target constructions with a similar pace regardless of the bias of the contexts they are presented with.

As for the data obtained from the end-of-trial truth-value judgment task, the results revealed that in the QP SUBJECT condition, the learners with low proficiency exhibited a tendency to accept the target constructions in surface and inverse scope contexts at similar rates. In the QP OBJECT condition, on the other hand, the intermediate L2 learners were found to judge the target statements presented in surface scope contexts as true more often than those presented in inverse scope contexts. These results are consonant with the results of the off-line study. Recall that in the off-line study the intermediate learners' interpretive preferences were discussed in conjunction with the Developmentally Modulated Transfer Hypothesis (Håkansson, Pienemann & Sayehli, 2002; Pienemann, Di Biase, Kawaguchi & Håkansson, 2005) and a pragmatic account of Turkish quantifier scope. That is, intermediate learners may have carried over the syntactic and semantic, but not the pragmatic, properties of the target structures, from their L1 to the L2 because their L2 system is developmentally ready to process them. In other words, the learners' limited processing resources in the L2 may be responsible for the partial transfer of the L1-based features. The same explanation may be adopted for the judgments of the intermediate students in the end-of-trial truth-value judgment task. Namely, the intermediate learners may have accepted both of the scope readings at similar rates possibly because they transferred the L1-based features of the target structures to the L2 in harmony with their L2 processing system.

F or convenience, the Figure 1 and Figure 2, which illustrate the mean rating scores in QP SUBJECT and QP OBJECT conditions in the off-line study, and Figure 9 and Figure 10, which represents the mean percentage of TRUE responses in QP

SUBJECT and QP OBJECT conditions in the on-line study, are repeated below. Note, however, that the scales across the two experiments are not directly comparable since in the off-line study a five-point scale was used, while in the on-line study binary response scale was employed. Nevertheless, the comparisons between the figures in both QP SUBJECT and QP OBJECT conditions suggest a similar trend for each group (i.e., intermediate learners, advanced learners, and English native speakers).

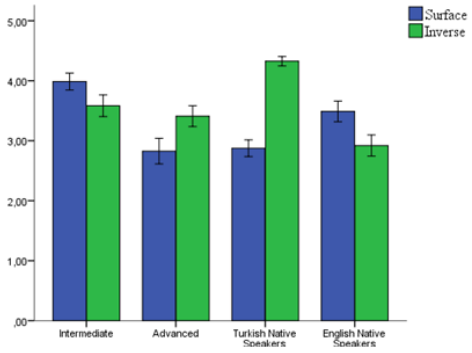


Figure 1. *Mean Rating Scores Across in QP SUBJECT Condition*

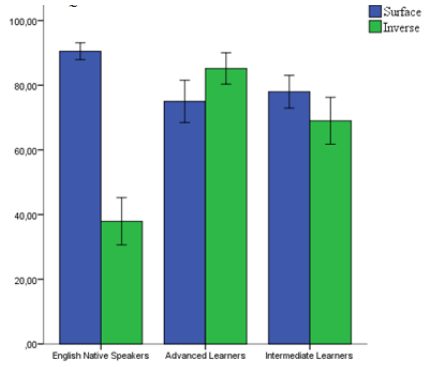


Figure 9. *Mean Percentages of TRUE Responses in QP SUBJECT Condition*

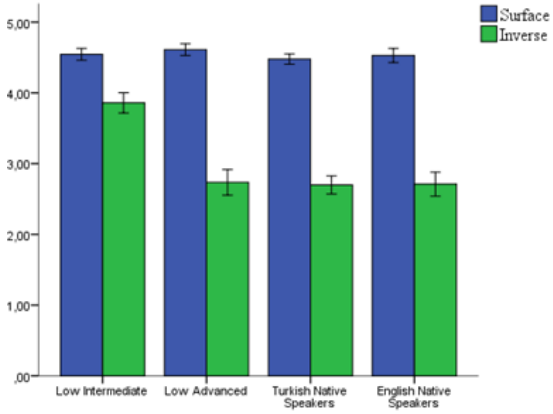


Figure 2. *Mean Rating Scores Across Groups In QP OBJECT Condition*

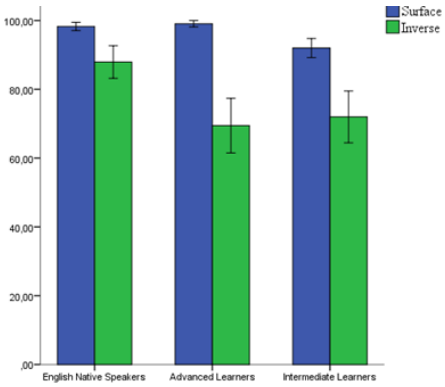


Figure 10. *Mean Percentages of TRUE Responses in QP OBJECT Condition*

All in all, the results suggested that the computation of inverse scope reading by English native speakers incurs more processing cost than that of surface scope reading, presumably because there are covert movements that should be performed by the speakers to obtain the inverse scope interpretation (Anderson, 2004; Tunstall, 1998; Dotlačil & Brasoveanu, 2015). Regarding the L2 learners' processing and judgments of the target constructions, the results indicated that there may be a developmental discrepancy between the L2 learners' processing mechanisms and grammatical competence, which accords with the research conducted by Papadopoulu, (2005), Zufferey, Mak, Degand, & Sanders (2015). One of the sources of such a difference may be the long-lasting influence of L1 transfer. As discussed by several researchers (Belletti, Bennati, & Sorace, 2007; Sánchez, Camacho, & Ulloa, 2010; Montrul, 2010; Yuan, 2012), the L1 transfer effects, in particular in the domain of pragmatics, may create a challenge for L2 learners even in advanced stages of second language acquisition. Furthermore, the learners who are in the initial stages of L2 acquisition were found to display non-native-like behaviors in their processing of the target constructions as well as in their interpretive judgments. The learners' use of a pressing strategy and their failure in the parsing of the L2 input were discussed as possible reasons of the intermediate L2 learners' divergent processing behaviors.

CHAPTER 5

GENERAL DISCUSSION AND CONCLUSION

The primary goal of this study was to examine the acquisition of scope by L2 learners of English. Specifically, the study aimed to find out how adult Turkish-speaking learners of English interpret constructions involving negation and a universal quantifier in either subject or object position in the target language. In order to test this research question, two experiments were conducted. The first involved a contextualized acceptability rating task, in which the respondents were asked to judge the acceptability of the target sentences in the scenario given. The task was administered to English and Turkish native speakers, as well as to the intermediate and advanced Turkish learners of English. In the second experiment, English native speakers and L2 learners of English were administered a self-paced reading task, in which the reading times of the participants were measured for each segment of the target construction. The task was accompanied by an end-of trial truth-value judgment task.

The results of the off-line study revealed that Turkish and English native speakers have opposing preferences in the interpretation of the constructions with negation where the universal quantifier occupied the subject position (QP SUBJECT). Turkish native speakers favored the inverse scope reading of such statements, whereas English native speakers judged the target constructions as ambiguous and exhibited a tendency for accepting the surface scope interpretation of the statements (*every > neg)* more than their inverse scope interpretation (*neg > every)*. The finding that English native speakers preferred the surface scope reading of the target constructions over their inverse scope reading in the QP SUBJECT condition does not confirm the theoretical accounts proposed by Horn, 1989;

Jackendoff, 1972; May, 1977; 1985 in that the English native speakers actually did not find such constructions ambiguous. Besides, this result runs counter to the argument made by Beghelli & Stowell (1996) in that the *every* > *neg* reading is, in fact, available in constructions with negation and subject universal quantifier in English. However, these results are in tune with the studies conducted by Conroy (2008), Lee (2009).

On the other hand, when the universal quantifier appeared in the object position (QP OBJECT), English and Turkish native speakers were identical to each other with respect to their scope interpretations: both groups of native speakers displayed a preference for the surface scope reading in their respective languages. Regarding the native Turkish speakers' judgments, the results were consistent with the proposal suggested by Kelepir (2001) in that the universal quantifier *her* (every) is interpreted within the scope of negation regardless of its syntactic position. As for the native English speakers' judgments, the results were consonant not only with theoretical accounts (Horn, 1989; Jackendoff, 1972; May, 1977; 1985), but also empirical investigations (Conroy, 2008; Lee, 2009; Musolino & Lidz, 2006; Musolino, 2006; Chung, 2009).

The results of the on-line study showed that the speakers with L1 English processed the inverse scope reading of the target constructions in both conditions (QP SUBJECT and QP OBJECT) more slowly than the surface scope reading, which is consistent with the findings of the studies reported by Anderson (2004), Kurtzman & MacDonald (1993), Pylkkänen & McElree (2006), Tunstall (1998), and Dotlačil & Brasoveanu (2015). By proposing the Principle of Processing Scope Economy, Anderson (2004) maintains that the computation of the inverse scope reading incurs more processing cost than the computation of the surface scope reading since there are additional movements to be performed in the structure to access the inverse scope reading. These results also support the results of the off-line study in that the inverse scope reading is the one that incurred longer reading times, which is indicative of the

increased processing cost (Bader & Meng, 1999; Featherston, 2005; Keller, 2000; Felser, Clahsen & Münte, 2003; Fiebach, Schlesewsky & Friederici, 2002; Matzke, Mai, Nager, Rüsseler & Münte, 2002). In other words, the processing difficulty of the inverse scope reading is consistent with the reduced acceptability of the target constructions presented in inverse scope contexts.

With respect to the L2 learner group, the results of the off-line and on-line studies revealed that there is a mismatch between the advanced L2 learners' processing behaviors and their acceptability judgments in the QP SUBJECT condition. That is, the L2 learners with advanced proficiency differed from the native speakers of English in their judgments of the target constructions in the QP SUBJECT condition although they demonstrated native-like processing behaviors in the comprehension of the target statements. One reason that can account for the gap that emerged between the advanced L2 learners' native-like processing behaviors and their nonnative-like acceptability judgments may be the developmental divergence between L2 grammar and processing system (Papadopoulu, 2005; Zufferey, Mak, Degand, & Sanders, 2015). Considering the fact that off-line tasks reflect the subjects' explicit knowledge, whereas on-line tasks provide information on the participants' implicit knowledge, the L2 learners in this study may have the implicit knowledge of the target scope phenomenon, yet they may have been unable to convert their implicit knowledge of L2 scope into their explicit judgments. Zufferey, Mak, Degand, and Sanders (2015) argue that the discrepancy between L2 competence and processing may be a consequence of the persistent L1 transfer effects. In other words, L2 learners may not easily override the L1 transfer effects in their judgments although they can process the L2 input in a native-like fashion. Assuming that it is a pragmatic constraint that guides the L2 learners to prefer one interpretation over the other in their L1 Turkish, the transfer of that L1-based pragmatic constraint may be responsible for the learners' non-native judgments. Similar findings are reported by Belletti, Bennati, and Sorace (2007), Sánchez, Camacho, and Ulloa (2010), Montrul (2010), and Yuan (2012), who claim that even

in advanced stages, the L1 transfer in the domain of pragmatics may pose a challenge to the second language learners. That is to say, it may be difficult for L2 learners to recover from the L1 influence in the area of pragmatics.

On the other hand, in the QP OBJECT condition, the advanced L2 learners behaved like native English speakers not only in the off-line study, but also in the on-line study. Given the fact that Turkish and English are similar to each other in terms of the interpretations that they allow for the constructions with negation and a universal quantifier in the object position, it can be stated that the learners' L1 knowledge of scope may have enabled them to perform like native-speakers.

Although the intermediate L2 learners seemed to behave like native speakers in their scope interpretations, the results of the on-line study revealed that the learners processed the target constructions in a non-native-like fashion. More precisely, in both conditions (QP SUBJECT and QP OBJECT) the learners with lower proficiency judged both of the scope interpretations as acceptable, and they read the target constructions presented in surface and inverse scope contexts at a similar pace. Given the fact that in native Turkish, the inverse scope reading is preferred in the QP SUBJECT condition, the transfer of L1 grammar in its entirety (Schwartz & Sprouse, 1996) cannot account for the results as the learners did not behave like Turkish native speakers in their scope interpretations. Contrary to the assumptions of the Full Transfer/Full Access Hypothesis (Schwartz & Sprouse, 1996; White, 2003) and the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987), the results showed that the learners with low proficiency do not seem to carry over their L1 grammar as a whole to the L2. In other words, the initial state of L2 grammar does not amount to the end state of L1 grammar. One possible explanation is that, in the off-line study, the learners may have resorted to a guessing strategy because of the demands of the contexts. That is, the intermediate L2 learners may have found the contexts or scenarios beyond their current linguistic knowledge, and thus they may have used the guessing strategy in the interpretation of the target statements. A similar explanation may also account for

the flat pattern observed in the intermediate L2 learners' processing behavior. Another alternative explanation is that the intermediate L2 learners may have partially transferred properties of their native language to their L2 in line with the Developmentally Moderated Transfer Hypothesis (Håkansson, Pienemann, & Sayehli, 2002; Pienemann, Di Biase, Kawaguchi, & Håkansson, 2005). The DMTH postulates that the learners' developing L2 processing system determines the extent of the L1 transfer because the learners can transfer only the properties of their native language that they can process within their L2 system. As highlighted by Pienemann (1998), the L2 learners must first acquire the necessary processing procedures in their L2 in order to be able to transfer the relevant features from their L1 to the L2. On the assumption that in native Turkish the speakers are mostly governed by a pragmatic constraint in their interpretation of the target constructions, it can be claimed that the learners with intermediate proficiency may have transferred the syntactic and semantic properties of the target scope phenomenon; however, they may not have yet transferred its pragmatic properties since their L2 system is not developmentally ready to process the L1-based pragmatic constraint. Taken together with the finding that the advanced L2 learners were similar to the native speakers of Turkish in their interpretations of the target statements, the results of the present study support the claim that the transfer of L1 grammar is developmentally moderated. Put it differently, at the onset of second language acquisition, the transfer of L1 grammar as a whole does not take place because of the limited nature of the L2 processing system. As L2 learners master the target language, their L2 processing system develops, which, in turn, increases the amount of L1 transfer.

The developmental pattern observed in L2 learners' processing of the target constructions may also provide additional support for the Developmentally Moderated Transfer Hypothesis (Håkansson, Pienemann, & Sayehli, 2002; Pienemann, Di Biase, Kawaguchi, & Håkansson, 2005) in that the L2 learners' processing resources in the target language develop as the learners become more proficient in the L2. That is to say, the intermediate L2 learners were incapable of

transferring the L1-based pragmatic features of the target constructions to the L2 because of their immature L2 processing system, and they displayed non-native-like processing behavior in their comprehension of the target structures. More advanced L2 learners, on the other hand, could transfer all the features of the target structures from their L1 to the L2 as a result of the development in their L2 processing system, as evidenced by their judgments in the off-line study, and they manifested native-like behavior in the processing of the target constructions. Besides, for the advanced learners the expansion of grammar actually started to take place in line with the Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987), as evidenced by the reading times in the QP SUBJECT condition.

The explanation based on the assumption that the scalar implicature governs native speakers' interpretations of the constructions in the QP SUBJECT condition in Turkish, however, raises the question why the scalar implicature does not guide the scope interpretations of English native speakers, who prefer the reading which should be eliminated by the scalar implicature. Given the assumption that constructions involving a universal quantifier phrase and negation are structurally identical in English and Turkish, then assuming that pragmatics works uniformly across languages, native speakers of Turkish and English should have the same judgments, contrary to fact. However, the finding that in the QP SUBJECT condition the English native speakers preferred the *every* > *neg* reading over the *neg* > *every* reading suggests that the native speakers of English do not rely on the scalar implicature to the extent that the Turkish native speakers do. In fact, the English native speakers chose to use an informationally weaker expression such as *every squirrel didn't pick up nuts* to convey the "none" meaning.

There are three possibilities that can account for the divergence between the two languages. One possibility is that Turkish and English do not have identical structures in that in Turkish the subject never leaves the [Spec VP]. As maintained by İşsever (2005), Turkish behaves differently with regard to the Extended Projection Principle (EPP), which needs to be satisfied by the movement of the

subject to [Spec TP], compared to the other languages since in Turkish [Spec TP] can remain unfilled. Thus, in constructions with negation and universal quantifier in the subject position the subject universal quantifier does not move to [Spec TP] to check EPP-feature on T^0. Instead, the EPP is "satisfied by the pronominal agreement on the verb" (Öztürk, 2004, p. 115). Another alternative is the inherent scope properties of the universal quantifier *her* "every" in Turkish. As highlighted by Kelepir (2001), the inherent scope properties of the universal quantifier *her* require that the universal QP should be interpreted within the scope of negation. It is also possible that the two languages, English and Turkish, may not be similar to each other with respect to the extent that they rely on contextual information (i.e., pragmatics for interpretation). Intuitively speaking, the fact that in Turkish argument drop is possible as opposed to English, it may be claimed that suggests that Turkish relies on contextual information relatively more than English does. Therefore, the native speakers of Turkish may rely on the scalar implicature to choose a scope reading, whereas English native speakers may rely on syntactic and semantic properties of the target constructions to reach the relevant scope interpretation.

In sum, the present findings have contributed to our understanding of the acquisition of scope by L2 learners in two ways. First, we learned that in the acquisition of the interaction between the negation and a universal quantifier there may be divergence between the learners' judgments and their processing behavior, as shown by the results from the advanced L2 learners. The reason behind such a disassociation may be the long-lasting effect of L1 transfer in the domain of pragmatics. Second, the learners who are assumed to be in the initial stages of second language acquisition do not necessarily transfer their L1 grammar in its entirety to their L2. Instead, they may transfer their L1 grammar to the L2 in harmony with their developing processing resources in the target language.

5.1. Limitations of the Study

One methodological limitation of the current study is the absence of an on-line experiment in L1 Turkish, which would help us to gain a better understanding of possible L1 transfer effects on L2 learners' processing of the target constructions. I am planning to carry out such an experiment in the future, as a follow up study to this thesis.

In addition, the L2 learner group in this study consisted of the low intermediate and the low advanced L2 learners. Having L2 learners with high advanced level of proficiency along with the intermediate and the advanced L2 learners would contribute to a clearer picture of the acquisition and processing of the scope interpretations by L2 learners as the addition of such a group would provide insights into the L2 grammar at later stages of acquisition.

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APPENDICES

APPENDIX A: Placement Test Interpretation

Score	Common European Framework Description	Common European Framework Level	Cambridge Examinations
55-60	Mastery (Upper Advanced)	C2	CPE
48-54	Effective Proficiency (Lower Advanced)	C1	CAE BEC Higher CELDS Higher
40-47	Vantage (Upper Intermediate)	B2	FCE CELS Vantage
30-39	Threshold (Lower Intermediate)	B1	PET BEC Preliminary CELS Preliminary
18-29	Waystage (Elementary)	A2	KET
0-17	Breakthrough	A1	
0	Beginner		

APPENDIX B: Turkish Items for the Off-line Study

Experimental Items (32 items)

Universal Quantifier in the Subject Position (16 items)

1. (every > neg)
   Dün Duygu'nun akşam yemeği için üç misafiri vardı. Misafirleri için balık pişirdiği sırada zil çaldı. Döndüğünde ise kedisi bütün balıkları yemişti. O da misafirleri için pizza sipariş etti.
   Her misafir balık yemedi.
2. (neg > every)
   Dün Duygu'nun akşam yemeği için üç misafiri vardı. Misafirleri için balık pişirmişti. Ancak misafirlerden biri balık alerjisi olduğu için balık yemedi. Duygu da ona pizza sipariş etti.
   Her misafir balık yemedi.
3. (every > neg)
   Mehmet'in üç çocuğu var ve çocukları her hafta bakkaldan şeker alırlar. Ancak bu hafta çocuklar anneannelerine gittiği için bakkala gitmedi ve şeker almadılar.
   Her çocuk şeker almadı.
4. (neg > every)
   Mehmet'in üç çocuğu var ve çocukları her hafta bakkaldan şeker alırlar. Ancak bu hafta en büyük çocuğu kolunu kırdığı için evde kaldı. Bu yüzden sadece iki çocuğu şeker aldı.
   Her çocuk şeker almadı.
5. (every > neg)
   Geçen hafta beş İngiliz sanatçı beraber açık hava konseri vermek için İstanbul'daydı. Ancak sahneye çıktıklarında birdenbire yağmur başladı ve konser iptal edildi.
   Her sanatçı şarkı söylemedi.
6. (neg > every)
   Geçen hafta beş İngiliz sanatçı beraber açık hava konseri vermek için İstanbul'daydı. Ancak konserde sadece üçü şarkı söyledi. Çünkü diğer ikisi hava değişiminden grip olmuştu.
   Her sanatçı şarkı söylemedi.
7. (neg > every)

Dün üç öğrenci ödev yapmak için kütüphanede buluştu. Ancak içlerinden biri ödevini evde unuttuğunu fark etti ve kütüphaneden ayrıldı. Diğerleri ise ödevlerini yaptılar.
Her öğrenci ödev yapmadı.

8. (every > neg)
Dün üç öğrenci ödev yapmak için kütüphanede buluştu. Ödevlerini nasıl yapacaklarını beraber düşündüler. Ancak hepsi o kadar yorgundu ki masanın üzerinde uyuyakaldılar.
Her öğrenci ödev yapmadı.
9. (neg > every)
Dört arkadaş aynı evi paylaşıyor ve her akşam beraber yemek yapıyorlar. Ancak dün akşam içlerinden ikisi hasta oldu ve yataktan çıkmadı. Bu yüzden yemeği sadece iki kişi yaptı.
Her arkadaş yemek yapmadı.
10. (every > neg)
Dört arkadaş aynı evi paylaşıyor ve her akşam beraber yemek yapıyorlar. Ancak dün akşam hepsinin zor bir sınavı olduğu için yemek yapmadılar. Onun yerine beraber ders çalıştılar.
Her arkadaş yemek yapmadı.
11. (neg > every)
Bir pizzacıda beş kurye çalışır ve kuryeler her gün evlere pizza dağıtırlar. Ancak dün içlerinden ikisinin motorsikleti bozuldu. O yüzden sadece üç kurye pizza dağıttı.
Her kurye pizza dağıtmadı.
12. (every > neg)
Bir pizzacıda beş kurye çalışır ve kuryeler her gün evlere pizza dağıtırlar. Ancak dün bütün gün kar yağdığı için kuryeler pizza dağıtmadılar. Onun yerine bulaşık yıkadılar.
Her kurye pizza dağıtmadı.
13. (neg > every)
Dün altı futbolcu maçtan sonra Facebook'ta foto paylaşmak istedi. Ancak üçü Facebook şifrelerini unuttuğu için foto paylaşmaktan vazgeçti. Diğerleri ise ondan fazla foto paylaştı.
Her futbolcu foto paylaşmadı
14. (every > neg)
Dün altı futbolcu maçtan sonra Facebook'ta foto paylaşmak istedi. Ancak bilgisayarlarını açtıklarında internette sorun olduğunu gördüler ve foto paylaşmaktan vazgeçtiler.

Her futbolcu foto paylaşmadı.

15. (every > neg)
    Geçen Pazar on aile pikniğe gitmek için araba kiralamak istedi. Ancak arabaların kiraları o kadar pahalıydı ki pikniğe gitmekten vazgeçtiler. Onun yerine evde parti verdiler.
    Her aile araba kiralamadı.
16. (neg > every)
    Geçen Pazar on aile pikniğe gitmek için araba kiralamak istedi. Ancak ailelerden sadece beşi araba kiraladı. Çünkü diğerleri pikniğe gitmekten vazgeçip evde parti verdi.
    Her aile araba kiralamadı.

Universal Quantifier in the Object Position (16 items)

1. (neg > every)
   Zeynep evinin bahçesine dün çiçek ekmek istedi. Marketten altı farklı çiçek aldı. Ancak, ilk üç çiçeği ektikten sonra yağmur başladı ve Zeynep ıslanmamak için içeri girdi.
   Zeynep her çiçeği ekmedi.
2. (every > neg)
   Zeynep evinin bahçesine dün çiçek ekmek istedi. Marketten altı farklı çiçek aldı. Ancak, çiçekleri ekmek için tam bahçeye çıkacaktı ki yağmur başladı. Zeynep de planından vazgeçti.
   Zeynep her çiçeği ekmedi.
3. (neg > every)
   Defne abisine hediye almak için kitapçıya gitti. Beş farklı kitap almaya karar verdi. Ancak cebindeki para sadece iki kitap almaya yettiği için Defne diğer kitapları yerlerine bıraktı.
   Defne her kitabı almadı.
4. (every > neg)
   Defne abisine hediye almak için kitapçıya gitti. Beş farklı kitap almaya karar verdi. Ancak kasaya gittiğinde cüzdanını evde unuttuğunu fark etti ve Defne, kitapları yerlerine bıraktı.
   Defne her kitabı almadı.
5. (neg > every)
   Ece dün eve gece yarısı geldi. Biraz sonra elektrikler kesildi. Yemek masasının üzerinde dört mum buldu. Mumlardan ikisini yaktı ve Ece, uyuyana kadar kitap okudu.
   Ece her mumu yakmadı.
6. (every > neg)

Ece dün eve gece yarısı geldi. Biraz sonra elektrikler kesildi. Yemek masasının üzerinde dört mum vardı, ama Ece o kadar yorgundu ki karanlıkta koltukta uyuyakaldı.
Ece her mumu yakmadı.

7. (every > neg)
Serdar sigarayı bırakmak için terapi almaya başladı. Ancak dün evi temizlerken masanın altında dört sigara buldu. Sigaraları içmemek için çöpe attı ve derin bir nefes aldı.
Serdar her sigarayı içmedi.
8. (neg > every)
Serdar sigarayı bırakmak için terapi almaya başladı. Ancak dün evi temizlerken masanın altında dört sigara buldu. Sigaralardan birini aldı ve içti. Geri kalanları ise çöpe attı.
Serdar her sigarayı içmedi.
9. (every > neg)
Gamze dün ödevini yapmak için kütüphaneye gitti. Yazdığı beş soruyu okudu. Ancak soruları çözmeye başlayacakken annesi aradı ve Gamze, aceleyle kütüphaneden ayrıldı.
Gamze her soruyu çözmedi.
10. (neg > every)
Gamze dün ödevini yapmak için kütüphaneye gitti. Yazdığı beş sorudan üçünü çözdü. Ancak o sırada arkadaşı geldi. Gamze de kalan soruları evde çözmeye karar verdi.
Gamze her soruyu çözmedi.
11. (neg > every)
Eren dün kardeşiyle bilgisayar oyunu oynamak istedi ve internetten beş oyun indirdi. Ancak oyunlardan üçü çalışmadığı için Eren, kardeşiyle geriye kalan iki oyunu oynadı.
Eren her oyunu oynamadı.
12. (every > neg)
Eren dün kardeşiyle bilgisayar oyunu oynamak istedi ve internetten beş oyun indirdi. Ancak tam oyun oynamaya başlayacaktı ki arkadaşı geldi. O da oyun oynamaktan vazgeçti.
Eren her oyunu oynamadı.
13. (every > neg)
Ömer dün sabah bankaya gitti. Üç elektrik ve iki telefon faturasını ödemek için sıraya girdi. Ancak faturaları ödeyecekken telefonu çaldı ve Ömer hızla bankadan ayrıldı.

Ömer her faturayı ödemedi.

14. (neg > every)
    Ömer dün sabah bankaya gitti. Üç elektrik ve iki telefon faturasını ödemek için sıraya girdi. Ancak faturalardan birini ödedikten sonra telefonu çaldı ve Ömer hızla bankadan ayrıldı.
    Ömer her faturayı ödemedi.
15. (every > neg)
    Emre geçen Cuma evini temizlemek istedi. Evindeki dört odasının hepsi kirliydi. Ancak odaları temizlemeye başlayacakken suların kesildiğini fark etti. O da temizlikten vazgeçti.
    Emre her odayı temizlemedi.
16. (neg > every)
    Emre geçen Cuma evini temizlemek istedi. Evindeki dört odasının hepsi kirliydi. Ancak odalardan ikisini temizledikten sonra sular kesildi. O da diğer odaları temizlemekten vazgeçti.
    Emre her odayı temizlemedi.

Fillers (20 items)

1. Okul müdürü Çınar'a altı sınıfın anahtarını verdi. Ancak Çınar, eve gittiğinde, anahtarlardan ikisini kaybettiğini fark etti ve ertesi gün işe gitmemeye karar verdi.
   Çınar bütün anahtarları kaybetmedi.
2. Dün dört çocuk dondurma yemek için bir kafeye gitti. Ancak çocuklar kafede fikirlerini değiştirdi ve ikisi çikolatalı kek sipariş etti. Diğer ikisi ise hiçbir şey sipariş etmedi.
   Bazı çocuklar dondurma sipariş etmedi.
3. Geçen Cuma on turist İzmir'deki müzeleri gezmeye karar verdi. Ancak turistlerden sadece üçü bütün müzeleri gezdi. Diğerleri ise iki müze gezdikten sonra yüzmeye gittiler.
   Her turist bazı müzeleri gezdi.
4. Beş öğrenci dün öğretmenlerine kızdı ve onların arabalarını boyamaya karar verdiler. Öğrenciler, beyaz arabaları boyadılar. Ancak, siyah ve kırmızı olanları boyamadılar.
   Bazı öğrenciler her arabayı boyadı.
5. Merve, dün altı arkadaşını doğum günü partisine davet etmek istedi. Arkadaşlarından üçünü aradı, ancak diğer üçünün numarası olmadığı için onları davet etmekten vazgeçti.
   Merve, bazı arkadaşlarını aramadı.

6. Bir şirkette film izlemeyi çok seven bir grup mühendis çalışır. Mühendisler her akşam bir kurgu filmi izler. Ancak, hiçbir zaman korku filmi izlemezler. Her mühendis bazı filmleri izler.
7. Geçen Cumartesi beş manken beraber alışverişe çıktı. Mankenler bir mağazaya girdiler ve kırmızı ve mavi elbiseleri denediler. Ancak hiçbiri sarı elbiseleri denemedi.
   Her manken bütün elbiseleri denedi.
8. Koray dün bahçesindeki ağaçları sulamak istedi. Ancak ağaçları sulamaya başlayacakken sular kesildiğini fark etti. Koray da ağaçları hafta sonu sulamaya karar verdi.
   Koray bazı ağaçları sulamadı.
9. Altı öğrenci geçen Salı bir sınava girdi. Ancak öğrencilerden sadece biri sınavdaki bütün soruları çözdü. Diğerleri ise soruların yarısını çözdüğünde sınav süresi bitmişti.
   Bazı öğrenciler her soruyu çözmedi.
10. Sekiz garson bir restoranda çalışıyor ve her akşam bardakları yıkıyorlar. Ancak dün akşam garsonlardan üçü bardakları yıkarken kırdı. Diğerleri ise bardakları kırmadan yıkadı.
    Bazı garsonlar bütün bardakları kırdı.
11. Burcu dün ailesiyle yürüyüşe çıktı ve elliden fazla foto çekti. Ancak eve döndüğünde, fotolardan sadece dördünü beğendi. O da kamerasındaki geriye kalan fotoları sildi.
    Burcu bütün fotoları silmedi.
12. Bir grup avukat beş sekreterden bazı formları bulmalarını istedi. Ancak sekreterlerden sadece ikisi bütün formları buldu. Diğerleri ise formlardan sadece birini buldu.
    Her sekreter bazı formları buldu.
13. Geçen hafta beş biletçi bir futbol maçı için yüzer bilet aldılar. Biletçilerden üçü bütün biletleri sattı. Ancak diğerleri biletlerin bir kısmını arkadaşlarına bedava verdi.
    Her biletçi bazı biletleri satmadı.
14. Sekiz hemşire bir hastanede çalışıyor ve her gün otuz hastaya bakıyorlar. Ancak dün, hemşirelerden üçü hasta olduğu için diğer hemşireler onların hastalarını da baktı.
    Her hemşire bütün hastalara baktı.
15. On postacı, her gün farklı adreslere mektup dağıtır. Postacılar postanenin yakınındaki ve üniversitedeki adresleri bilir. Ancak hiçbiri şehir dışındaki adresleri bilmez.

Bütün postacılar bazı adresleri bilir.

16. Dün dört aşçı baklava yapmak için anlaştı. Ancak mutfağa gittiklerinde aşçılardan ikisi fikir değiştirdi ve baklava yerine kek yapmaya karar verdi. Diğerleri ise baklava yaptı.
    Bütün aşçılar baklava yapmadı.
17. Bir okulda dört müdür çalışır ve her Salı velilere e-posta gönderirler. Ancak dün okulda elektrikler kesildiği için müdürler e-posta göndermedi. Onun yerine velileri aradılar.
    Bütün müdürler e-posta göndermedi.
18. Dün altı öğretmen bir toplantıya katıldı ve toplantıda beş rapor yazmaya karar verdiler. Ancak içlerinden üçü bilgisayarını ofiste unuttuğu için raporları, diğer öğretmenler yazdı.
    Bazı öğretmeler bütün raporları yazdı.
19. Geçen Pazar dört hakem maç yapmak için A takımındaki futbolcuları aramaya karar verdi. Ancak sadece ikisi futbolcuları aradı, çünkü diğerlerinde futbolcuların numaraları yoktu.
    Bütün hakemler futbolcuları aradı.
20. Dün yedi dansçı bir kuaföre gitti ve kuaförde beklerken masadaki dergileri okumaya başladılar. Ancak dansçılardan ikisi dergi okumadı. Onun yerine televizyon izlediler.
    Bazı dansçılar dergi okumadı.

APPENDIX C: English Items for the Off-line Study

Experimental Items (32 items)

Universal Quantifier in the Subject Position (16 items)

1. (every > neg)
   Last night Joe had three guests over dinner. While he was preparing fish for them, there was a knock at the door. When he came back into the kitchen, his cat had eaten all the fish. So, he ordered pizza for his guests instead.
   Every guest didn't eat fish.
2. (neg > every)
   Last night Daniel had three guests over for dinner and he cooked fish for them. However, one of his guests didn't eat the fish because of her allergies. So, Daniel ordered pizza for her.
   Every guest didn't eat fish.
3. (every > neg)
   Rachel has three children and every week her children go to the market to buy candy. However, this week all of her children went to stay with their aunt. So, they didn't go to the market and didn't buy candy.
   Every child didn't buy candy.
4. (neg > every)
   Rachel has three children and every week her children go to the market to buy candy. But, this week one of her children broke his arm and stayed at home. So, only two children bought candy
   Every child didn't buy candy.
5. (every > neg)
   Last Sunday, five American singers were in Istanbul to give an outdoor concert together. However, when they came on stage, it suddenly started to rain heavily. Therefore, the concert was cancelled.
   Every singer didn't sing at the concert.
6. (neg > every)
   Last Sunday, five American singers were in Istanbul to give an outdoor concert together. However, only two singers ended up performing because the others got a cold due to the change in temperature.
   Every singer didn't sing at the concert.
7. (neg > every)
   Last Monday three students met at the library to do their homework. However, only one of them did her homework because the other two gave up doing the homework and watched a movie instead.

Every student didn't do the homework.

8. (every > neg)
   Last Monday, three students met at the library to do their homework. They started talking about how to do it, but they were so tired that they ended up falling asleep at the table.
   Every student didn't do the homework
9. (neg > every)
   Four girls share the same apartment and they cook dinner together every day. However, yesterday two of the girls had a cold and stayed in bed to rest. So, only two of them cooked dinner.
   Every girl didn't cook dinner.
10. (every > neg)
    Four girls share the same apartment and they cook dinner together every day. However, yesterday they didn't cook dinner because the next day they had a difficult exam. Instead, they studied for the exam.
    Every girl didn't cook dinner.
11. (neg > every)
    Five deliverymen work for a pizza restaurant and deliver pizzas to homes. Yesterday, however, two of the deliverymen's motorbikes broke down. So, yesterday only three deliverymen delivered pizzas.
    Every deliveryman didn't deliver pizza.
12. (every > neg)
    Five deliverymen work for a pizza restaurant and deliver pizzas to homes. Yesterday, however, they didn't deliver pizzas as it snowed heavily. Instead, they washed the dishes at the restaurant.
    Every deliveryman didn't deliver pizza.
13. (neg > every)
    Last night, six football players wanted to have some wine after the match. However, three of them changed their mind because they would drive home. So, the remaining three players drank a bottle of wine.
    Every player didn't drink wine.
14. (every > neg)
    Last night, six football players wanted to drink wine after the match. However, they changed their minds when they got to the bar. Instead of wine, they decided to drink two bottles of champagne.
    Every player didn't drink wine.
15. (neg > every)

Last Sunday ten families decided to rent cars to go on a picnic. However, only five of them rented the cars. The other families changed their minds and decided to throw a party at home instead.
Every family didn't rent a car.

16. (every > neg)
Last Sunday, ten families decided to rent cars to go on a picnic. However, the car rentals were too expensive, so they gave up going on a picnic. Instead, they decided to throw a party at home.
Every family didn't rent a car.

Universal Quantifier in the Object Position (16 items)

1. (neg > every)
Tom wanted to plant flowers in his garden yesterday. He went to the market and bought six flowers. However, after he planted three of the flowers, it started to rain. So, he went back home in order not to get wet.
Tom didn't plant every flower.
2. (every > neg)
Tom wanted to plant flowers in his garden yesterday. He went to the market and bought six flowers. However, just as he was about to plant them, it started to rain. So, Tom gave up planting the flowers.
Tom didn't plant every flower.
3. (neg > every)
Ashley went to the bookstore to buy a gift for her brother and decided to buy five books for him. Then she realized that she only had enough money for two of the books. So, she put the others back on the shelf.
Ashley didn't buy every book.
4. (every > neg)
Ashley went to the bookstore to buy a gift for her brother and decided to buy five books for him. However, at the checkout, she realized that she had left her purse at home. So, she put the books back on the shelf.
Ashley didn't buy every book.
5. (neg > every)
Ted came home late at night the other day and just then the electricity went out. He found four candles on the dining table and lit two of them. He sat down and read a book until he fell asleep.
Ted didn't light every candle.

6. (every > neg)
   Ted came home late at night the other day and then the electricity went out. There were four candles on the dining table. However, Ted was so tired that he didn't light the candles but went to sleep in the dark instead.
   Ted didn't light every candle.
7. (every > neg)
   Robert is in therapy to quit smoking. However, while he was cleaning his home yesterday, he found four cigarettes under the table. He threw away all the cigarettes and took a deep breath.
   Robert didn't smoke every cigarette.
8. (neg > every)
   Robert is in therapy to quit smoking. However, while he was cleaning his home yesterday, he found four cigarettes under the table. He took one of them and smoked it. He threw the rest away.
   Robert didn't smoke every cigarette.
9. (every > neg)
   Erin went to the library to do her homework yesterday. She read the five questions in her notebook. However, just as she was about to start answering them, her mother called her to come home. So, she quickly left the library.
   Erin didn't answer every question.
10. Erin went to the library to do her homework yesterday. After she answered three of the five questions in her notebook, her friend showed up. Erin decided to answer the rest of the questions at home.
    Erin didn't answer every question.
11. (neg > every)
    The other day, Amy downloaded five computer games from the Internet to play with her sister. However, they ended up playing only two of the games because three of the games did not work on the computer.
    The girls did not play every game.
12. (every > neg)
    The other day, Amy downloaded five games from the Internet to play with her sister. However, when they were about to play the games, Amy's friend Harry showed up and the girls gave up playing the games.
    The girls did not play every game.
13. (every > neg)
    Yesterday John went to the bank, and stood in the line to pay his three electricity and two phone bills. However, when he was about to pay the bills, he received a phone call and had to quickly leave the bank.

John didn't pay every bill.

14. (neg > every)
    Yesterday John went to the bank and stood in the line to pay his three electricity and two phone bills. However, after he paid one of the bills, he received a phone call and had to quickly leave the bank.
    John didn't pay every bill.
15. (every > neg)
    Last night, Mike wanted to clean his house. There were four dirty rooms. However, just as he was about to start cleaning them, he realized that the water had been cut off. So, he gave up cleaning the rooms.
    Mike didn't clean every room.
16. (neg > every)
    Last night, Mike wanted to clean his house. There were four dirty rooms. However, after he cleaned two of the rooms, he realized that the water stopped running. So, he gave up cleaning the rest of the rooms.
    Mike didn't clean every room.

Fillers (20 items)

1. Yesterday, Steven took the keys to six offices from the director. However, when he went home, he realized that he had lost two of the keys. So, he decided no to go to work the following day.
   Steven didn't lose all of the keys.
2. Last Saturday, four children went to a cafe to eat ice-cream. However, they changed their minds when they arrived to the café. Two of them ordered a slice of cake and the others ordered a bowl of pudding.
   Some children didn't order ice-cream.
3. Last Friday, ten tourists decided to visit all the museums in İstanbul. However, only three of them visited all of the museums. The rest of them went swimming after having visited two museums.
   Every tourist visited some museums.
4. Last Tuesday, five students got angry at their teachers, and decided to paint their cars. However, they didn't paint black and red cars. They just painted white cars.
   Some students painted every car.
5. Yesterday, Susan wanted to invite six of her friends to her birthday party. However, she called only three of them because she didn't have the phone numbers of the remaining three friends.
   Susan didn't call some of her friends.

6. A group of computer engineers work for a company and they love watching movies. Every night they watch a science fiction movie. However, they never watch horror movies.
   Every engineer watches horror movies.
7. Last Saturday five models decided to go shopping together. They met up in a shopping mall, and went into a store. They tried out red and blue dresses. However, none of them tried out any yellow dresses.
   Every model tried out all the dresses.
8. Yesterday, Diane wanted to water the trees in her garden. However, just as she was about to start watering them, she realized that the water in the house had been cut off. So, Diane decided to water the trees later.
   Diane didn't water some trees.
9. Last Tuesday, six students took an exam. However, only one of the students answered all of the questions. The others only managed to answer half of the questions before the exam ended.
   Some students didn't answer every question.
10. Eight waiters work for a restaurant and every night they wash up the glasses. However, last night three of the waiters broke some glasses during the washing-up. The others washed the glasses without breaking any.
    Some waiters broke all the glasses.
11. David went hiking with his family, and took more than sixty photos. However, when he later reviewed the photos at home, he liked only four of them. So, he decided to delete the other photos on his camera.
    David didn't delete all of the photos.
12. A group of lawyers asked five secretaries to find some documents for a meeting. However, only two of the secretaries found all the documents. The rest of them found just one document.
    Every secretary found some document.
13. Last weekend, five ticket sellers each bought one hundred tickets for a football match. Three of the ticket sellers sold all of their tickets. The others gave some of the tickets to their friends for free.
    Every ticket seller didn't sell some tickets.
14. Eight nurses work for a hospital, and they each look after thirty patients every day. However, yesterday three of the nurses had a bad cold. So, the others had to look after their patients as well.
    Every nurse looked after all the patients.

15. Ten postmen deliver letters to different places in a town. The postmen know the addresses of places close to the post office and the university. Yet, they do not know any out-of-town addresses.
    All the postmen know some addresses.
16. Last Sunday, four cooks agreed to make cheesecake. However, when they walked into the kitchen, two of the cooks changed their minds, and made cherry pie instead. So, only two cooks made cheesecake.
    All the cooks didn't make cheesecake.
17. Four principals work for a school and every day they send e-mails to parents. However, yesterday they didn't send e-mails to the parents because the electricity went out. Instead, they called the parents on the phone.
    All the directors didn't send e-mails to parents.
18. The other day, six teachers attended a meeting and in the meeting, they decided to write five reports. However, only three of the teachers wrote the reports since the rest of them left their computers at their offices.
    Some teachers wrote all of the reports.
19. Last Sunday, four coaches decided to call their players to play a friendly match. However, only two of the coaches ended up calling the players because the others didn't have their phone numbers.
    All the coaches called the players.
20. Seven dancers went to a hairdresser the other day. While waiting, five of them started to read the magazines on the table. On the other hand, two of the dancers didn't read any magazines. Instead, they watched TV.
    Some dancers didn't read a magazine.

APPENDIX D: Background Questionnaire for L2 Learner Group

Background Questionnaire for L2 Group

This questionnaire is used to collect information about your language learning background. All information will kept confidential and only seen by the researcher herself. Please answer the following questions.

1. Your name: _____
2. Gender: Male ( ) Female ( )
3. Age: _____
4. What is/are your native language(s)? _____
5. What other languages do you know? _____
6. At what age did you start learning English? _____
7. How long have you been learning English? _____
8. How frequently do you use English every day (1=almost never, 2=rarely, 3=sometimes, 4=often, 5=very often)?

Reading:	1	2	3	4	5
Writing:	1	2	3	4	5
Speaking:	1	2	3	4	5
Listening:	1	2	3	4	5

9. Have you ever lived in countries where English is spoken as a primary language?
   Provide the name of the county and the total length of stay. Otherwise, leave blank.
   Name of the country: _____ Length of stay: _____
10. How do you self-rate your overall English proficiency?
    Beginner: ( )
    Lower Intermediate: ( )
    Upper Intermediate: ( )
    Advanced: ( )
    Near Native: ( )
11. Have you ever taken TOEFL, IELTS, or Hacettepe/METU proficiency exam?
    Provide your most recent score and the month and year you took the test.
    When: _____ TOEFL: ( ) Score: _____
    When: _____ IELTS: ( ) Score: _____
    When: _____ Hacettepe/METU Proficiency: ( ) Score: _____

APPENDIX E: Items for the On-line Study

Experimental Items (32 items)

Universal Quantifier in the Subject Position (16 items)

1. (neg > every)
   Yesterday morning, Tom got six flowers to plant in his garden. However, after he planted only three of the flowers, it started to rain, so he went back home.
   Tom/ didn't/ plant/ every/ flower/ yesterday/ morning./
2. (every > neg)
   Yesterday morning, Tom got six flowers to plant in his garden. However, just as he was about to plant them, it started to rain, so he gave up planting the flowers.
   Tom/ didn't/ plant/ every/ flower/ yesterday/ morning./
3. (neg > every)
   Last week, Ashley wanted to buy five books in the bookstore. However, she only had enough money for two of the books. So, she put the others back on the shelf.
   Ashley/ didn't/ buy/ every/ book/ last/ week./
4. (every > neg)
   Last week, Ashley wanted to buy five books in the bookstore. However, at the checkout, she realized that she had left her purse at home. So, she put the books back on the shelf.
   Ashley/ didn't/ buy/ every/ book/ last/ week./
5. (neg > every)
   Last night, Ted was studying when the electricity went out. Ted found six candles on the table. He lit two of them and continued studying.
   Ted/ didn't/ light/ every/ candle/ last/ night./
6. (every > neg)
   Last night, Ted was studying when the electricity went out. Ted found six candles on the table. However, he didn't light the candles. Instead, he went to sleep.
   Ted/ didn't/ light/ every/ candle/ last/ night./
7. (every > neg)
   Last Saturday, Robert found four cigarettes in his car while driving home. He threw away all the cigarettes because he was in therapy to quit smoking.

Robert/ didn't/ smoke/ every/ cigarette/ last/ Saturday./

8. (neg > every)
   Robert is in therapy to quit smoking. However, last Saturday he found four cigarettes in his car. He took one of them and smoked it. He threw the rest away.
   Robert/ didn't/ smoke/ every/ cigarette/ last/ Saturday./
9. (every > neg)
   Yesterday morning, Erin wanted to do her homework. As she was about to start answering the five questions in her notebook, her friend showed up. So, she decided to answer them later.
   Erin/ didn't/ answer/ every/ question/ yesterday/ morning./
10. (neg > every)
    Yesterday morning, Erin wanted to do her homework. After she answered two of the five questions in her notebook, her friend showed up. So, she decided to answer the others later.
    Erin/ didn't/ answer/ every/ question/ yesterday/ morning./
11. (neg > every)
    Last Thursday, Amy downloaded five games from the Internet to play. However, she ended up playing only one of them because the other games didn't work on her computer.
    Amy/ didn't/ play/ every/ game/ last/ Thursday./
12. (every > neg)
    Last Thursday, Amy downloaded five games from the Internet to play. However, when she was about to play the games, her friends showed up. So, she gave up playing the games.
    Amy/ didn't/ play/ every/ game/ last/ Thursday./
13. (every > neg)
    Last Tuesday, John was in the bank to pay his four bills. However, when he was about to pay the bills, he received a phone call and quickly left the bank.
    John/ didn't/ pay/ every/ bill/ last/ Tuesday./
14. (neg > every)
    Last Tuesday, John was in the bank to pay his four bills. However, after he paid one of the bills, he received a phone call and had to quickly leave the bank.
    John/ didn't/ pay/ every/ bill/ last/ Tuesday./
15. (every > neg)

Last weekend, Mike wanted to clean the four dirty rooms in his house. But then he realized that the water had been cut off. So, he gave up cleaning the rooms.
Mike/ didn't/ clean/ every/ room/ last/ weekend./

16. (neg > every)
Last weekend, Mike wanted to clean the four dirty rooms in his house. However, after he cleaned two of the rooms, his friend showed up. So, he gave up cleaning the other rooms.
Mike/ didn't/ clean/ every/ room/ last/ weekend./

Universal Quantifier in the Object Position (16 items)

1. (every > neg)
Last night, Joe cooked fish for his three guests. However, when he was away from the kitchen, his cat ate all the fish. So, he ordered pizza for his guests instead.
Every/ guest/ didn't/ eat/ fish/ last/ night./
2. (neg > every)
Last night, Joe cooked fish for his three guests. However, one of his guests didn't eat the fish because of her allergies. So, Joe ordered pizza for her.
Every/ guest/ didn't/ eat/ fish/ last/ night./
3. (every > neg)
Every week Rachel's three children go to the market to buy candy. But, last week all the children stayed with their aunt. So, they didn't go to the market to buy candy.
Every/ child/ didn't/ buy/ candy/ last/ week./
4. (neg > every)
Every week, Rachel's three children go to the market to buy candy. But, last week one of her children broke his arm and stayed at home. So, only two children bought candy.
Every/ child/ didn't/ buy/ candy/ last/ week./
5. (every > neg)
Yesterday, while five singers were getting ready for an outdoor concert, it suddenly started to rain heavily. Therefore, the concert was cancelled.
Every/ singer/ didn't/ sing/ a /song/ yesterday./
6. (neg > every)
Yesterday, five singers were in İstanbul to give a concert. However, only two singers ended up performing because the others got a cold.
Every/ singer/ didn't/ sing/ a /song/ yesterday./
7. (neg > every)

Yesterday, three students met at the library to do their homework. However, only one of them did her homework. The other two watched a movie instead.
Every/ student/ didn't/ do/ the/ homework/ yesterday./

8. (every > neg)
   Yesterday, three students met at the library to do their homework. However, they were so tired that they ended up falling asleep at the table.
   Every/ student/ didn't/ do/ the/ homework/ yesterday./
9. (neg > every)
   Four housemate girls cook dinner together every day. However, last night, two of the girls had a cold and stayed in bed. So, only two of them cooked dinner.
   Every/ girl/ didn't/ cook/ dinner/ last/ night./
10. (every > neg)
    Four housemate girls cook dinner together every day. However, last night, they didn't cook dinner because they had to study for the exam.
    Every/ girl/ didn't/ cook/ dinner/ last/ night./
11. (neg > every)
    Five pizza-boys deliver pizzas to homes every day. Last weekend, however, two of the pizza-boys' motorbikes broke down. So, only three of them delivered pizzas.
    Every/ pizza-boy/ didn't/ deliver/ pizza/ last/ weekend./
12. (every > neg)
    Five pizza-boys deliver pizzas to homes every day. Last weekend, however, they didn't deliver pizzas because it snowed heavily. Instead, they washed the dishes at the restaurant.
    Every/ pizza-boy/ didn't/ deliver/ pizza/ last/ weekend./
13. (neg > every)
    Last night, six tennis players were in a bar to drink wine. However, two of them changed their mind and ordered coffee instead. The others drank a bottle of wine.
    Every/ player/ didn't/ drink/ wine/ last/ night./
14. (every > neg)
    Last night, six tennis players were in a bar to drink wine. However, they changed their minds and drank two bottles of champagne instead.
    Every/ player/ didn't/ drink/ wine/ last/ night./
15. (every > neg)

Yesterday, ten families wanted to rent cars to go on a picnic. However, the car rentals were so expensive that they decided to throw a party at home instead.
Every/ family/ didn't/ rent/ a/ car/ yesterday./

16. (neg > every)
Yesterday, ten families wanted to rent cars to go on a picnic. However, only five of them rented the cars because the others decided to throw a party at home instead.
Every/ family/ didn't/ rent/ a/ car/ yesterday./

Fillers (20 items)

1. Yesterday, Steven took the keys of six offices from the director. However, somehow he lost two of the keys, so he didn't go to work the following day.
Steven/ took/ six/ keys/ to/ offices/ yesterday./
2. Last Saturday morning, four children were in a café to eat ice-cream. However, only two of them ordered ice-cream. The others ordered a slice of cake.
No/ child/ ordered/ ice-cream/ last/ Saturday/ morning./
3. Last Friday morning, ten tourists agreed to visit all the museums in İstanbul. However, only three of them visited all the museums. The others went swimming instead.
Every/ tourist/ went/ swimming/ last/ Friday/ morning./
4. Last Tuesday, five students got angry at their teachers and decided to paint their cars. However, they didn't paint red cars. They just painted white cars.
Every/ student/ painted/ a/ car/ last/ Tuesday./
5. Yesterday, Susan wanted to invite her six friends for dinner. However, she called only three of them because she didn't have the others' phone numbers.
Susan/ called/ none/ of/ her/ friends/ yesterday./
6. Six computer engineers watch a Western movie together every day. Yesterday, however, they watched a horror movie instead of a Western movie.
All/ engineers/ watched/ a/ horror/ movie/ yesterday./
7. Yesterday five models went shopping. They tried on red and blue dresses. However, none of them tried on any yellow dresses.
Five/ models/ tried/ on/ every/ dress/ yesterday./
8. Last Saturday, Diane wanted to water the trees in her garden. But then it started raining outside. So, she decided not to water the trees.
Diane/ didn't/ water/ any/ trees/ last/ Saturday./

9. Last Tuesday, six students took an exam. However, only one student answered all the questions. The others answered only half of the questions.
   Six/ students/ answered/ every/ question/ last/ Tuesday./
10. Eight waiters wash up glasses in a restaurant. However, last night two of them broke some glasses during the washing-up. The others washed the glasses without breaking any.
    Eight/ waiters/ broke/ a/ glass/ last/ night./
11. David took more than sixty photos on a trip. However, when he recently reviewed the photos, he liked only four of them. So, he deleted the others.
    David/ didn't/ delete/ all/ the/ photos/ recently./
12. Last Friday, a lawyer asked four secretaries to find some documents. One secretary found all the documents. The others found just two documents.
    Every/ secretary/ found/ some/ documents/ last/ Friday./
13. Last weekend, five ticket-sellers each bought a bunch of tickets for a concert. However, only three of them sold all of their tickets. The others gave the tickets to their friends for free.
    All/ ticket-sellers/ sold/ their/ tickets/ last/ weekend./
14. Eight nurses look after patients in a hospital. Last Tuesday, however, three of them had a cold. So, the remaining five looked after the patients of the sick nurses as well.
    Five/ nurses/ looked/ after/ patients/ last/ Tuesday./
15. Ten postmen deliver letters to different places in town. They know the addresses of places close to the post office. Yet, they do not know any out-of-town addresses.
    Every/ postman/ knows/ some/ addresses/ in/ town./
16. Last Sunday morning, four cooks agreed to make cheesecake. But then two of the cooks changed their minds and made cherry pie instead. So, only two cooks made cheesecake.
    No/ cook/ made/ cheesecake/ last/ Sunday/ morning./
17. Yesterday, four directors in a school decided to send e-mails to parents. However, they ended up calling the parents on the phone because the electricity went out.
    The/ directors/ didn't/ send/ any/ e-mails/ yesterday./
18. Last Monday, six teachers had to write a report. However, only two of them wrote it because the others left their laptops at their offices.
    Two/ teachers/ wrote/ the/ report/ last/ Monday./

19. Last Sunday, four coaches wanted their players to play a match. However, only two of them ended up calling the players because the others didn't have their phone numbers.
    Four/ players/ called/ some/ coaches/ last/ Sunday./
20. Last weekend, seven dancers went to a hairdresser's. While waiting, five of them read the magazines and the others watched TV.
    Some/ dancers/ read/ magazines/ last/ weekend./

APPENDIX F: The instructions of the On-line Experiment

In this experiment you will read a situation, followed by a target sentence describing the situation, at your own pace. Then you will be asked to decide whether or not the target sentence is TRUE/FALSE in the given situation.

Before beginning, please turn off anything that could possibly distract you from devoting your full attention to this task. This includes music, television, games, other programs, or text-messaging clients.

Please MAXIMIZE your browser window so that nothing else is visible. This will make it easier to read the sentences.

In this study you'll be asked to read sentences.
Sentences will be presented as a series of dashes on the screen, like this:

____ _____ _____ _____ _____
Behind each of these dashes is a word or a phrase. All together, these words or phrases make up a sentence.
Every time your press the [SPACEBAR] a word or a phrase will appear.
You'll read the sentence phrase-by-phrase, like this:
This __ _____ _____
____ is _____ _____
____ __ an example _____
____ __ _____ practice item.
After the sentence has finished, you'll be asked to decide whether or not the target sentence is TRUE/FALSE in the given situation.
If you think that the sentence is TRUE, press D on the keyboard.
If you think that the sentence is FALSE, press K on the keyboard.

APPENDIX G: Turkish Summary
"HER ÖĞRENCİ İNGİLİZCE ÖĞRENMEDİ" NİCEL SÖZCÜKLERİN İKİNCİ DİLDE EDİNİMİ

GİRİŞ

Çalışmanın Amacı

Bu çalışma anadili Türkçe olan ve İngilizce'yi ikinci dil olarak öğrenen bireylerin nicel sözcük edinimlerini incelemektedir. Bir başka deyişle, bu çalışma İngilizce ikinci dil olarak öğrenen Türklerin nicel sözcükleriyle olumsuzluk eki içeren ve birden fazla anlama gelebilen (ör. Defne her kitabı almadı.) nasıl yorumladıklarını araştırmaktadır. Çalışmanın bir diğer amacı ise hedef yapının farklı dillerde edinimine katkı sağlamaktır.

Literatür

İkinci dil edinimi alanında ikinci dil öğrenen insanların nicel sözcüklerin oluşturduğu farklı anlamları edinimlerine yönelik pek çok araştırma yapılmıştır (Chung, 2009, 2012; Ionin, Luchkina & Stoops, 2014; Kwak, 2010; Lee, 2009; Marsden, 2005, 2009). Bu çalışmaların ortak vardığı sonuç ise ikinci dil öğrenen bireylerin nicel sözcüklerden kaynaklı çok anlamlılık içeren yapıları edinimlerinde gelişimsel bir ilerlemenin olduğudur. Bir başka ifadeyle, dil öğreniminin başında ikinci dil öğrenen bireylerin anadillerinden hedef yapıyla ilgili özellikleri ikinci dillerine transfer ettikleri ve dil öğreniminin ileri düzeylerinde ikinci dil öğrencilerinin anadillerinden kaynaklanan transfer etkilerinden kurtuldukları saptanmıştır.

Hedef yapının ikinci dilde edinimine yönelik pek çok çalışma olmasına rağmen, nicel sözcüklerden kaynaklı çok anlamlılık içeren yapıların ikinci dilde nasıl işlemlendiğine dair yapılan çalışmalar sayıca azdır (Lee, 2009; Lee & Kwak, 2008).

Bu çalışmaların elde ettiği ortak sonuç ise ikinci dil öğrenen bireylerin hedef yapılara yönelik yargıları ile onları işlemleme davranışları arasında bir fark olduğudur.

Çalışmanın Alana Katkısı

Bu çalışma, sıklıkla test edilen Çince, Japonca, Korece ve Fransızca gibi dillerin anadil konuşucularının aksine nadiren test edilen bir dil olan anadil Türkçe konuşucularında yapılmıştır. Bu anlamda çalışma alana farklı bir dilden veri sağlayarak katkı sağlayacaktır. Buna ek olarak, anadili Türkçe olan ve İngilizce'yi ikinci dil olarak öğrenen bireylerin hedef dil İngilizce'deki niceleyici sözcük ve olumsuzluk eki içeren yapıları nasıl yorumladıklarına yönelik yok denecek kadar az çalışma olduğu için bu çalışma bu anlamda da alana katkı sağlayacaktır.

Niceleyici Sözcük ve Olumsuzluk Eki İçeren Yapıların Söz konusu Dillerdeki Yorumları

İngilizce

İngilizce niceleyici sözcük örnek (1)'deki gibi özne durumunda iken cümle çok anlamlıdır (Horn, 1989; Jackendoff, 1972; May, 1977, 1985).

(1) Every squirrel didn't pick up nuts.

a. Surface scope yorumu (*her* > *not*):
Every squirrel is such that it did not pick up nuts.
'Hiçbir sincap fındık toplamadı.'
b. Inverse scope yorumu (*not* > *her*):
Not every squirrel picked up nuts.
'Bazı sincaplar fındık toplamadı.'

(1a)'da cümlenin surface scope yorumu mantıksal yapıda (LF) özne durumundaki *every squirrel* yüzey yapıda olduğu yerden yorumlandığı için oluşur. Bu yorumda, *every squirrel* olumsuzluk ekini k-buyurur. Öte yandan, (1b)'de özne

durumundaki *every squirrel* mantıksal yapıda orijinal yeri olan içsel eylem öbeğinde yorumlanır. Bu yorumda, *every squirrel* olumsuzluk eki tarafından k-buyurulur.

Niceleyici sözcük örnek (2)'deki gibi nesne durumunda iken ise cümlenin çok anlamlı olmadığı iddia edilir (Aoun & Li, 1993; Chung, 2012; Musolino & Lidz, 2006; Musolino, 2006).

(2) Squirrels didn't pick up every nut.

a. Surface scope reading (*not* > *her*):
It is not the case that squirrels picked up every nut.
'Sincaplar bazı fındıkları toplamadı.'

b. *Inverse scope reading (*her* > *not*):
Every nut is such that it was not picked up by squirrels.
'Sincaplar hiçbir fındığı toplamadı.'

(2a)'da cümlenin surface scope yorumu mantıksal yapıda nesne durumundaki *every nut* yüzey yapıda olduğu yerden yorumlandığı için oluşur. Bu yorumda, olumsuzluk eki *every nut* öğesini k-buyurur. Öte yandan, (2b)'de nesne durumundaki *every nut* mantıksal yapıda olumsuzluk ekini k-buyurur ve böylece yapı sadece surface scope anlamında yorumlanır.

Türkçe

Niceleyici sözcük örnek (3)'teki gibi özne durumunda iken ise cümlenin niceleyici sözcük olan *her*'in içsel özelliklerinden dolayı çok anlamlı olmadığı iddia edilir (Kelepir, 2001; Özyıldız, to appear). Türkçe (3)'teki cümlenin sadece inverse scope yorumuna izin verir.

(3) Her kedi süt içmedi.

a. √ Inverse scope yorumu (*neg* > *her*)
Bazı kediler süt içti.

b. *Surface scope yorumu (*her* > *neg*)
Hiçbir kedi süt içmedi.

Benzer olarak niceleyici sözcük (4)'teki gibi nesne durumunda olduğunda cümlenin niceleyici sözcük olan *her*'in içsel özelliklerinden dolayı çok anlamlılığa yol açmadığı söylenir (Kelepir, 2001; Özyıldız, to appear). Bu anlamda Türkçe (4)'teki gibi ifadelerde sadece surface scope yorumuna izin verir.

(4) Ali her kitabı okumadı.

a. √ Surface scope yorumu (*neg* > *her*)
Bazı kitaplar Ali tarafından okundu.
b. *Inverse scope (*her* > *neg*)
Hiçbir kitap Ali tarafından okunmadı.

Türkçe ve İngilizce'yi niceleyici sözcük yorumları açısında kıyasladığımız zaman özne durumundaki niceleyici sözcüklerin yorumunda iki dilin birbirinden farklı davrandığını söyleyebiliriz. Özne durumunda niceleyici sözcük içeren cümleler İngilizce'de *her* > *neg* anlamında yorumlanırken, aynı yapılar Türkçe'de *neg* > *her* anlamında yorumlanır. Nesne durumundaki niceleyici sözcük içeren yapılar ise iki dilde de *neg* > *her* anlamında yorumlanır.

Araştırma Soruları ve Hipotezler

- Anadili Türkçe olan ve İngilizce'yi ikinci dil olarak öğrenen bireyler hedef dildeki niceleyici sözcük ve olumsuzluk eki içeren yapıları nasıl yorumlarlar?

Full Transfer/Full Access Hipotezi doğrultusunda bireylerin özne durumunda niceleyici sözcük içeren hedef yapı yorumlarında anadil konuşucularına gelişimsel olarak benzerlik taşımaları beklenmektedir. Bunun yanı sıra, nesne durumunda niceleyici sözcük içeren hedef yapıları yorumlarında ise iki dil arasındaki benzerlikten dolayı anadil konuşucuları ile aralarında bir fark olması beklenmemektedir.

- Anadili Türkçe ve İngilizce'yi ikinci dil olarak öğrenen bireyler ne derece anadillerindeki yorumsal tercihleri hedef dillerine transfer ederler?

- Farklı düzeydeki ikinci dil öğrenen bireylerin hedef yapıları yorumlamalarında düzeye bağlı bir farklılık olur mu?

Full Transfer/Full Access Hipotezi (Schwartz & Sprouse, 1996) dayanak alınarak düşük seviyede ikinci dil öğrenenlerin dil öğrenimlerinin başında anadillerini ikinci dillerine bütün olarak transfer etmeleri ve bu yüzden anadildeki yorumsal tercihlerini hedef dile transfer ederek niceleyici sözcüklerin özne durumunda olduğu yapıları neg her anlamıyla yorumlamaları beklenmektedir.

Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987) doğrultusunda ileri düzeyde ikinci dil öğrenen bireylerin var olan gramerlerini genişletmeleri ve anadillerinde olmamasına rağmen her neg yorumunu edinmeleri beklenmektedir.

OFF-LINE DENEY

Katılımcılar

Bu çalışmada iki grup katılımcı yer almıştır.

Anadili Türkçe Olan Bireyler/Anadili Türkçe Olup İkinci Dil Olarak İngilizce Öğrenen Bireyler:

Anadili Türkçe olan 92 birey bu çalışmaya katılmıştır. Bireylerin yaş ortalaması 20.1'dir. Bu katılımcılardan 49'u kadın, 43'ü erkektir. Aynı katılımcı grubu ikinci dildeki seviyelerine göre Oxford Quick Placement Test uygulanarak ikiye bölünmüştür. Elde edilen sonuçlar katılımcıların 39'unun ileri düzeyde 36'sının ise orta düzeyde İngilizce bildiklerini ortaya koymuştur.

Anadili İngilizce Olan Bireyler:

44 anadili İngilizce olan birey kontrol grubu olarak çalışmaya katılmıştır. Yaş ortalamaları 29'dur. İçlerinden 20'si kadın, 24'ü erkektir.

Veri Toplama Araçları

Bu çalışmada üç adet veri toplama aracı geliştirilmiştir. Bunlardan ilki Türkçe hazırlanan off-line kabul edilebilirlik ölçeğidir. Bu ölçekte katılımcılara hedef cümlenin verilen durumu betimlemede ne kadar kabul edilebilir olduğu sorulmuştur. Türkçe hazırlanan kabul edilebilirlik ölçeği anadil Türkçe konuşucularına niceleyici sözcük içeren cümleleri nasıl yorumladıklarında dair dayanak oluşturması amacıyla uygulanmıştır. Örnek bir test maddesi aşağıda verilmiştir.

(5)

Last night Joe had three guests over dinner. While he was preparing fish for them, there was a knock at the door. When he came back into the kitchen, his cat had eaten all the fish. So, he ordered pizza for his guests instead.

Every guest didn't eat fish.

1	2	3	4	5
Unacceptable	Not very acceptable	Neutral	Somewhat acceptable	Acceptable

Bu ölçeğin İngilizce versiyonu da anadil İngilizce konuşucularına ve anadili Türkçe olup İngilizce'yi ikinci dil olarak öğrenen bireylere uygulanmak için hazırlanmıştır. Örnek bir test maddesi aşağıda verilmiştir.

(6)

Geçen Pazar on aile pikniğe gitmek için araba kiralamak istedi. Ancak arabaların kiraları o kadar pahalıydı ki pikniğe gitmekten vazgeçtiler. Onun yerine evde parti verdiler.

Her aile araba kiralamadı.

1	2	3	4	5
Kabul Edilemez	Kısmen Kabul Edilemez	Nötr	Kısmen Kabul Edilebilir	Kabul Edilebilir

Bu ölçeklerin her biri için 32 adet test maddesi geliştirilmiştir. 32 test maddesinden 16'sında niceleyici sözcük özne durumunda iken geriye kalan 16 maddede niceleyici sözcük nesne durumundadır. Her bir 16 maddelik grup içinde maddelerin 8 tanesi surface scope yorumu öne çıkaran durumlarla, diğer 8 tanesi ise inverse scope yorumu öne çıkaran durumlarla sunulmuştur. Örnek bir set test maddesi aşağıda verilmiştir.

(7) <u>Niceleyici Sözcük ÖZNE Durumunda</u>

c. Surface Scope Yorumu (*neg* > *her*)

Dün Duygu'nun akşam yemeği için üç misafiri vardı. Misafirleri için balık pişirmişti. Ancak misafirlerden biri balık alerjisi olduğu için balık yemedi. Duygu da ona pizza sipariş etti.

d. Inverse Scope Yorumu (*her* > *neg*)

Dün Duygu'nun akşam yemeği için üç misafiri vardı. Misafirleri için balık pişirdiği sırada zil çaldı. Döndüğünde ise kedisi bütün balıkları yemişti. O da misafirleri için pizza sipariş etti.

Hedef Cümle:

Her misafir balık yemedi.

(8) Niceleyici Sözcük NESNE Durumunda

c. Surface Scope Yorumu (*neg* > *her*)

Defne abisine hediye almak için kitapçıya gitti. Beş farklı kitap almaya karar verdi. Ancak cebindeki para sadece iki kitap almaya yettiği için Defne diğer kitapları yerlerine bıraktı.

d. Inverse Scope Reading (*her* > *neg*)

Defne abisine hediye almak için kitapçıya gitti. Beş farklı kitap almaya karar verdi. Ancak kasaya gittiğinde cüzdanını evde unuttuğunu fark etti ve Defne, kitapları yerlerine bıraktı.

Hedef Cümle:

Defne her kitabı almadı.

Katılımcılar her bir hedef cümleyi sadece bir durumda görmeleri amacıyla da oluşturulan 32 test maddesi iki listeye dağıtılmıştır. Test maddelerinin yanı sıra 20 adet test maddelerine benzer maddeler oluşturulmuştur. Bunların 12 tanesi çok anlamlı değilken, 8'i çok anlamlıdır. Ancak bu 8 madde test maddelerindeki çok anlamlılıktan farklı bir şekilde çok anlamlılık taşımaktadır. Örnek bir madde aşağıda verilmiştir.

(9) Geçen Pazar dört hakem maç yapmak için A takımındaki futbolcuları aramaya karar verdi. Ancak sadece ikisi futbolcuları aradı, çünkü diğerlerinde futbolcuların numaraları yoktu.

Cümle:
Bütün hakemler futbolcuları aradı.

Yöntem

Bu çalışma zaman ve mekan kısıtlamasının önüne geçmek amacıyla internet tabanlı bir anket uygulama platformu olan www.surveygizmo.com aracılığıyla uygulanmıştır. Katılımcılar ankete elektronik posta yoluyla davet edilmiştirler. Çalışmanın tamamlanması yaklaşık 20 dakika almıştır.

Data Analizi

Öncelikle katılımcıların söz konusu ölçeği cevaplarken yeteri kadar dikkatli olup olmadıklarını kontrol etmek için katılımcıların çok anlamlılık taşımayan maddelere verdikleri değerlendirme skorları hesaplanmıştır. Ardından katılımcıların ortalama derecelendirme skorları üzerinde betimleyici ve çıkarımsal istatistik testleri uygulanmıştır. İstatistiksel analiz *SPSS Versiyon 20.0* programı aracılığıyla yapılmıştır.

Sonuçlar

Anadili Türkçe Olan Bireyler

Anadil Türkçe konuşucularının çok anlamlılığa yol açmayan test maddeleri dışındaki maddelere verdikleri değerlendirme skoru verilen duruma göre uygunluğu kabul edilebilir maddeler için 4,65, verilen duruma göre kabul edilemez maddeler için 1.35 olarak bulunmuştur. Anadili Türkçe olan bireylerin test maddelerine yönelik değerlendirme skorları Tablo-1'de verilmiştir.

Tablo 1. *Anadili Türkçe Olan Bireylerin Test Maddelerine Yönelik Değerlendirme Skorları (n=92)*

	NS ÖZNE Durumunda		NS NESNE Durumunda	
	Mean (SD)	Range	Mean (SD)	Range
Surface Scope	2.87 (1.33)	1-5	4.47 (.70)	2-5
Inverse Scope	4.32 (.75)	1.25-5	2.69 (1.22)	1-5

Niceleyici sözcüğün (NS) özne durumunda olduğu cümleleri yorumlarken, anadil Türkçe konuşucuları inverse scope yorumunu surface scope yorumuna kayda değer bir ölçüde tercih etmişlerdir. Niceleyici sözcüğün nesne durumunda olduğu cümlelerde ise surface scope yorumunu inverse scope yorumuna anlamlı bir ölçüde tercih etmişlerdir.

Anadili İngilizce Olan Bireyler

Anadil İngilizce konuşucularının çok anlamlılığa yol açmayan test maddeleri dışındaki maddelere verdikleri değerlendirme skoru verilen duruma göre uygunluğu kabul edilebilir maddeler için 4.50, verilen duruma göre kabul edilemez maddeler için 1.25 olarak bulunmuştur. Anadili İngilizce olan bireylerin test maddelerine yönelik değerlendirme skorları Tablo-2'de verilmiştir.

Tablo 2. Anadili İngilizce Olan Bireylerin Test Maddelerine Yönelik Değerlendirme Skorları *(n=44)*

	NS ÖZNE Durumunda		NS NESNE Durumunda	
	Mean (SD)	Range	Mean (SD)	Range
Surface Scope	3.48 (1.14)	1-5	4.52 (.66)	2.25-5
Inverse Scope	2.92 (1.16)	1-5	2.71 (1.12)	1-4.75

Niceleyici sözcük ÖZNE durumunda, anadil İngilizce konuşucularının surface scope yorumunu inverse scope yorumuna kayda değer bir ölçüde tercih ettikleri bulunmuştur. Niceleyici Sözcük NESNE durumunda ise anadili İngilizce olan bireyler surface scope yorumunu ön plana çıkaran durumlarla birlikte verilen cümleleri inverse scope yorumunu ön plana çıkaran durumlarla verilen cümlelere oranla daha kabul edilebilir bulmuşlardır.

Anadili Türkçe Olan ve İngilizce'yi İkinci Dil Olarak Öğrenen Bireyler

Anadili Türkçe olan ve İngilizceyi ikinci dil olarak öğrenen ileri düzeydeki bireylerin çok anlamlılığa yol açmayan test maddeleri dışındaki maddelere verdikleri değerlendirme skoru verilen duruma göre uygunluğu kabul edilebilir maddeler için 4.40, verilen duruma göre kabul edilemez maddeler için 1.31 olarak bulunmuştur. Benzer olarak, anadili Türkçe olan ve İngilizce'yi ikinci dil olarak öğrenen orta düzeydeki bireylerin çok anlamlılığa yol açmayan test maddeleri dışındaki maddelere verdikleri değerlendirme skoru verilen duruma göre uygunluğu kabul edilebilir maddeler için 4.35, verilen duruma göre kabul edilemez maddeler için 1.38 olarak bulunmuştur. İkinci dil olarak İngilizce öğrenen bireylerin test maddelerine yönelik değerlendirme skorları Tablo-3'de verilmiştir.

Tablo 3. *İkinci Dil Olarak İngilizce Öğrenen Bireylerin Test Maddelerine Yönelik Değerlendirme Skorları*

		Orta Düzey (*n*=39)		İleri Düzey (*n*=36)	
		Mean (SD)	Range	Mean (SD)	Range
NS ÖZNE	Surface	3.98 (.88)	1-5	2.82 (1.28)	1-5
Durumunda	Inverse	3.58 (1.12)	1.25-5	3.40 (1.03)	1-5
NS NESNE	Surface	4.54 (.51)	3.25-5	4.60 (.50)	3-5
Durumunda	Inverse	3.85 (.90)	2-5	2.73 (1.09)	1-4.5

Tartışma

Off-line çalışmadan elde edilen sonuçlar, anadil Türkçe ve İngilizce konuşucularının niceleyici sözcük ÖZNE durumunda cümleleri yorumlarken birbirlerinden farklı yorumsal tercihler yaptıklarını ortaya koymuştur. Bir başka deyişle, Anadili Türkçe olan bireyler *neg* > her yorumunu tercih ederken, anadili İngilizce olan bireyler *her* > *neg* yorumunu tercih etmişlerdir. Niceleyici sözcük NESNE durumunda ise anadili Türkçe ve İngilizce olan bireylerin, beklenildiği gibi, aynı yorumsal tercihlerinde bulundukları görülmüştür. Yani, her iki ana dil konuşucusu grupta niceleyici sözcük nesne durumundaki cümleleri yorumlarken *neg* > *her* yorumunu tercih etmişlerdir.

İkinci dil olarak İngilizce'yi öğrenen bireylerin gurubunda ise hem ileri düzeydeki hem de orta düzeydeki öğrencilerin niceleyici sözcük NESNE durumunda anadil konuşucularına benzer yorumsal tercihler yaptıkları bulunmuştur. Türkçe ve İngilizce arasında bu yapıların yorumları açısından bulunan benzerlik ikinci dil öğrenen bireylerin neden anadil konuşucularına benzer yorumları seçtiklerini açıklayabilir.

Niceleyici sözcük ÖZNE durumunda ileri düzeydeki öğrencilerin anadil İngilizce konuşucularına benzer yorumsal tercihler yapmadıkları bulunmuştur. Bu gruptaki öğrenciler, anadili Türkçe olan bireyler gibi, *neg* > *her* yorumunu *her* > *neg* yorumuna tercih etmişlerdir. Diğer taraftan orta düzeydeki öğrencilerin anadil İngilizce konuşucularına benzer yorumsal seçimler yaptıkları saptanmıştır. Bir başka deyişle, orta düzeyde İngilizce bilen gruptaki bireyler, anadil İngilizce konuşucularına benzer olarak, *her* > *neg* yorumunu *neg* > *every* yorumuna tercih etmişlerdir.

Elde edilen bu sonuçlar, Full Transfer Full Access (Schwartz & Sprouse, 1996) hipotezi doğrultusunda yapılan tahminleri doğrular nitelikte olmamıştır. Bu hipoteze göre, düşük seviyede ikinci dil öğrenenlerin dil öğrenimlerinin başında

anadillerini ikinci dillerine bütün olarak transfer etmeleri ve bu yüzden anadil Türkçe'deki yorumsal tercihlerini hedef dile transfer ederek niceleyici sözcüklerin özne durumunda olduğu yapıları neg her anlamıyla yorumlamaları beklenmekteydi. Ancak sonuçlar, bu gruptaki bireylerin anadildeki gramerlerini ikinci dile bürün olarak transfer etmediklerini göstermiştir. Diğer yandan, Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987) doğrultusnda ileri düzeyde ikinci dil öğrenen bireylerin var olan gramerlerini genişletmeleri ve anadillerinde olmamasına rağmen her neg yorumunu edinmeleri beklenmekteydi. Ancak sonuçlar, bu gruptaki öğrencilerin de var olan gramerlerini genişletemediklerini ve hedef dildeki yorumu kendi gramerlerine henüz ekleyemediklerini göstermiştir.

Orta düzeydeki öğrenci grubundan elde verilerin iki sebebi olabilir. Öğrenciler Subset Principle (Berwick, 1985; Manzini & Wexler, 1987; Wexler & Manzini, 1987) doğrultusunda anadillerinde olmayan bir yorumu ikinci dillerine eklemekte başarılı olmuş olabilirler. Ya da öğrenciler bir tahmin stratejisi geliştirmiş ve ölçekteki soruları da bu stratejiye göre cevaplamışlardır. Niceleyici sözcük NESNE durumunda söz konusu grubun inverse scope kabul edilebilirlik skorunun anadil konuşucularından daha yüksek olduğu düşünüldüğünde, bu gruptaki bireylerin tahmin stratejisi geliştirmiş olma ihtimalleri güçlenmektedir.

İki gruptaki dil öğrencilerinin sonuçları bütün olarak ele alındığında ortaya gelişimsel bir çizgi çıkmamaktadır. İkinci dil olarak İngilizce öğrenen bireyler arasındaki gelişimsel olmayan yorum farklılıklar Developmentally Moderated Trasfer hipotezi ile Türkçe'de nicel sözcüklerin edimsel bir açıdan yorumuyla izah edilmiştir. Developmentally Moderated Transfer hipotezine göre ikinci dil öğrenen bireyler anadillerinden ikinci dillerine ikinci dillerindeki işleme sisteminde işlemleyebildikleri özellikleri transfer edebilirler. Bu anlamda, Türkçe'de anadil dil konuşucularına belirli bir yorumu tercih etmeye yönelten mekanizmanın ölçümsel sezdirim olduğu farz edilmiştir ve orta düzeyde dil öğrencilerinin Türkçe'den hedefe yapıların sadece söz bilimsel ve anlam bilimsel özelliklerini transfer ettikleri

tartışılmıştır. Bu gruptaki öğrenciler hedef yapıların edimsel özelliklerini anadillerinden ikinci dillerine transfer etmedikleri için-ikinci dildeki kısıtlı işlemleme mekanizmalarından dolayı-her iki scope yorumunu da kabul edilebilir bulmuşlardır. Öte yandan, ileri düzeydeki dil öğrencileri hedef yapıların anadilden söz bilimsel, anlam bilimsel ve edim bilimsel özelliklerini transfer ettikleri için ikinci dildeki hedef yapıları anadil Türkçe konuşucularına benzer olarak yorumlamışlardır. Bu sonuç, birinci dildeki modüllerin ikinci dile transferinin gelişimsel olarak ikinci dildeki işlemleme mekanizmalarına bağlı olduğunu göstermektedir.

ON-LINE DENEY

Katılımcılar

Bu çalışmada iki grup katılımcı yer almıştır.

Anadili Türkçe Olup İkinci Dil Olarak İngilizce Öğrenen Bireyler:

Bu gruptaki bireyler ikinci dildeki seviyelerine göre Oxford Quick Placement Test uygulanarak ikiye bölünmüştür. Elde edilen sonuçlar katılımcıların 27'sinin ileri düzeyde 25'inin ise orta düzeyde İngilizce bildiklerini ortaya koymuştur.

Anadili İngilizce Olan Bireyler:

29 anadili İngilizce olan birey kontrol grubu olarak çalışmaya katılmıştır. Yaş ortalamaları 30'dur. İçlerinden 16'sı kadın, 13'ü erkektir.

Veri Toplama Araçları

Bu deney doğruluk yargı testiyle kendi hızında okuma taskının birleşiminden oluşur. Off-line kabul edilebilirlik ölçeğinde kullanılan test maddeleri bu taskta kullanılmak üzere iki şekilde adapte edilmiştir. Hedef cümlelerin sonuna zarf niteliğinde bir ifade eklenmiştir. Böylece kritik bölgenin son bölge olmaması sağlanmıştır. Hedef cümleler beraber verilen durumlar uzunluk açısından

kısaltılmıştır. Böylece katılımcıların kısa süreli belleklerindeki yük azaltılmaya çalışılmıştır.

On-line çalışmada katılımcılara durumlar bir bütün olarak sunulmuş, ardından hedef cümle kelime kelime verilmiştir. Katılımcılar hedef cümleyi okumayı bitirdikten sonra kendilerine hedef cümlenin verilen durumu betimleme doğru olup olmadığı sorulmuştur. Böylece katılımcıların taska yeteri kadar dikkat verip vermedikleri de ölçülmüştür. Aşağıda örnek bir test maddesi sunulmuştur. Taksim işaretleri hedef cümlenin bölgelerini temsil etmektedir.

(10) Universal Quantifier in Subject Position

c. Surface Scope Yorumu (*neg* > *her*)
   Last night, Joe cooked fish for his three guests. However, one of his guests didn't eat the fish because of her allergies. So, Joe ordered pizza for her.

d. Inverse Scope Yorumu (*her* > *neg*)
   Last night, Joe cooked fish for his three guests. However, when he was away from the kitchen, his cat ate all the fish. So, he ordered pizza for his guests instead.
   Experimental Sentence:

Every/	guest/	didn't/	eat/	fish/	last/	night./
R1	R2	R3	R4	R5	R6	R7

Yöntem

Bu çalışma Alex Drummond'un IBEX platformunda uygulanmıştır (http://spellout.net/ibexfarm/).

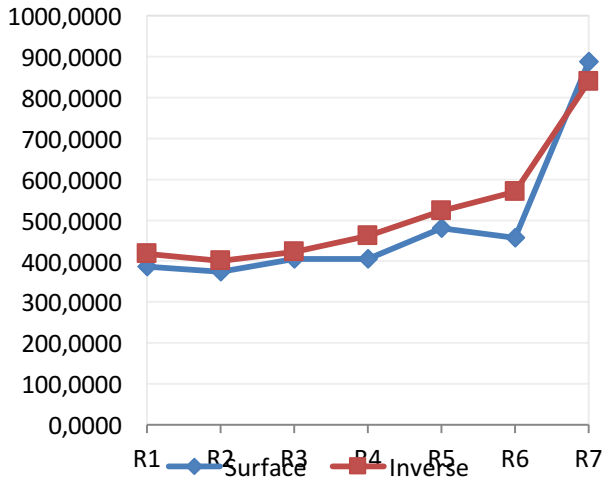
Data Analizi

Analiz için öncelikle verideki uçdeğer belirlenmiş ve veri uçdeğerlerden arındırılmıştır. Düşük uç değer noktası 100 ms, yüksek uç değer noktası ise 3000 ms

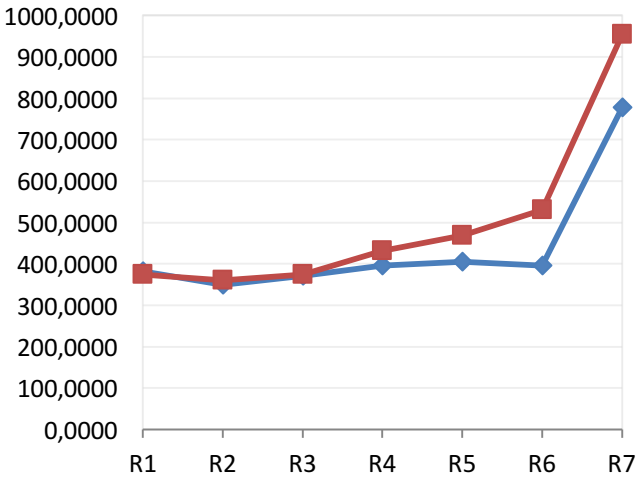
olarak belirlenmiştir. Elde edilen veri log formation analizi ile normalleştirilmiştir. Ardından ortalamalar üzerinde çeşitli istatiksel testler uygulanmıştır.

Sonuçlar

Anadili İngilizce Olan Bireyler



Figür 1. *Anadili İngilizce olan Bireyler-Niceleyici Sözcük ÖZNE Durumunda*

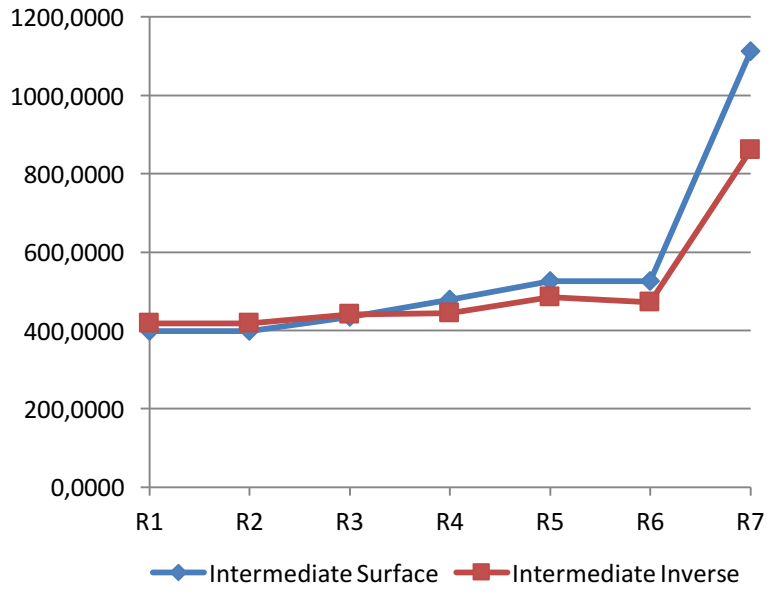


Figür 2. *Anadili İngilizce olan Bireyler-Niceleyici Sözcük NESNE Durumunda*

Anadili İngilizce olan bireyler niceleyici sözcük ÖZNE durumunda hedef cümleleri inverse scope yorumu ile surface scope yorumuna göre daha uzun sürede işlemlemişlerdir. Figür 3'te de görüldüğü gibi bu gruptaki bireyler Region 4 ve Region 6'da inverse scope yorumunu surface scope yorumundan daha uzun sürede okumuşlardır. Benzer olarak, niceleyici sözcük NESNE durumunda hedef cümleleri Region 6'da inverse scope yorumu ile surfce scope yorumuna göre daha uzun sürede işlemlemişlerdir.

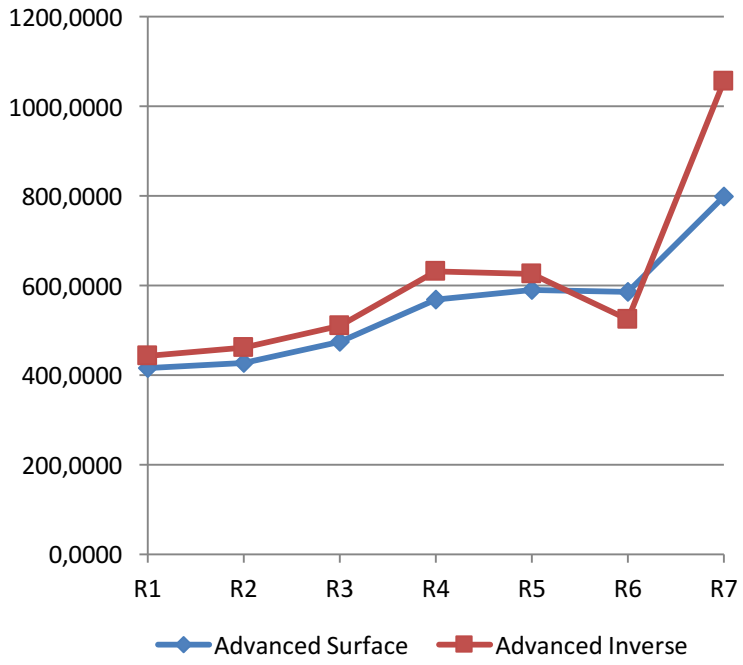
Anadili Türkçe Olan Ve İngilizce'yi İkinci Dil Olarak Öğrenen Bireyler

Niceleyici sözcük ÖZNE durumunda orta düzeydeki dil öğrencilerin okuma zamanlarında inverse scope ve surface scope yorumları arasında sadece en son bölgede kayda değer bir farklılık bulunmuştur. Bunun dışındaki bölgelerde bu gruptaki bireyler surface scope ve inverse scope yorumlarını benzer zamanlarda işlemlemişlerdir.



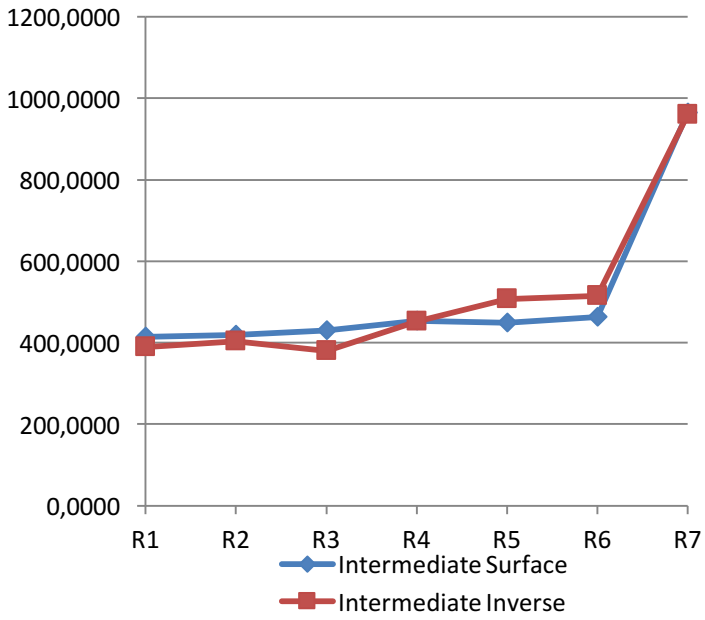
Figür 3. *Orta Düzeyde Dil Öğrenen Grup-Niceleyici Sözcük ÖZNE Durumunda*

Öte yandan, ileri düzeydeki öğrenciler anadili İngilizce bireylere benzer işlemleme desenleri ortaya koymuştur. Region 4 ve Region 7'de anadil konuşucularına benzer olarak inverse scope yorumunu surface scope yorumuna oranla daha uzun sürede işlemlemişlerdir

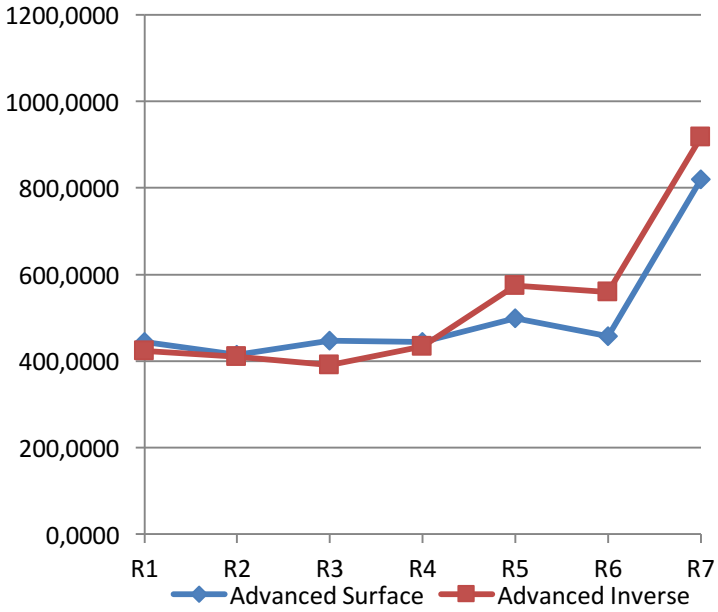


Figür 4. *İleri Düzeyde Dil Öğrenen Grup-Niceleyici Sözcük ÖZNE Durumunda*

Niceleyici sözcük NESNE durumunda ise orta düzeydeki dil öğrencilerin surface scope ve inverse scope yorumları arasındaki okuma zamanlarında kayda değer bir fark bulunmamıştır. Bunun yanı sıra, ileri düzeydeki dil öğrencileri anadili İngilizce olan bireylere benzer olarak inverse scope yorumunu surface scope yorumuna göre daha uzun sürede işlemlemişlerdir. Region 5 ve Region 6'da iki yorum arasında kayda değer farklılıklar bulunmuştur.



Figür 5 . *Orta Düzeyde Dil Öğrenen Grup-Niceleyici Sözcük NESNE Durumunda*



Figür 6. *İleri Düzeyde Dil Öğrenen Grup-Niceleyici Sözcük NESNE Durumunda*

Tartışma

Anadil İngilizce olan bireylerin inverse scope yorumunu surface scope yorumundan daha uzun sürede işlemlemeleri the Principle of Processing Scope Economy (Anderson, 2004)'yi desteklemektedir.

İleri Düzeydeki dil öğrencilerinin anadil konuşucularına benzer işlemleme yapmaları ise Dekydtspotter ve Outcalt (2005), Hopp (2006), Dussias (2003), Williams, Möbius ve Kim (2001), Mitsugi ve MacWhinney (2010) tarafından yapılan çalışmalarla aynı doğrultudadır.

Orta düzeydeki bireylerin iki yorum arasında iki durumda da kritik bölgelerde kayda değer fark göstermemelerinin iki sebebi olabilir. Bu gruptaki bireyler klavyedeki boşluk çubuğuna basma stratejisi geliştirmiş olabilirler. Alternatif olarak ikinci dil işlemlemeleri sırasında yaşadıkları bir aksaklık var olan bilgileri kullanmalarını engellemiş olabilir ve bu grup bu yüzden anadil konuşucularından farklı işlemleme modelleri göstermiş olabilir.

SONUÇ

İleri düzeyde İngilizce öğrenen bireylerin hedef yapılara yönelik yargıları ve işlemlemeleri arasında bir fark bulunmuştur (Papadopoulu, 2005; Zufferey, Mak, Degand, & Sanders, 2015). Bu farkın özellikle edimsel bilim açısından anadil transferinden kaynaklanıyor olabileceği tartışılmıştır (Belletti, Bennati, & Sorace, 2007; Sánchez, Camacho, & Ulloa, 2010; Montrul, 2010; Yuan, 2012).

Orta düzeyde İngilizce öğrenen bireylerin ise hedef yapılara yönelik hem yargıları hem de işlemleme desenleri anadil konuşucularınınkiyle benzerlik taşımadığı saptanmıştır. Developmentally Moderated Transfer Hypothesis (Håkansson, Pienemann, & Sayehli, 2002; Pienemann, Di Biase, Kawaguchi, & Håkansson, 2005) ile bu öğrencilerin anadilden ikinci dildeki işlemleri mekanizmaları yeterli olmadığı için hedef yapıların bütün özelliklerini transfer

etmedikleri ve yaptıkları kısmi transfer sonucunda da anadili İngilizce olan bireylerden hem işlemlemede hem de hedef yapılara yönelik yargılarında ayrıldıkları tartışılmıştır.

APPENDIX H: Tez Fotokopi İzin Foruu

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü [ ]

Sosyal Bilimler Enstitüsü [x]

Uygulamalı Matematik Enstitüsü [ ]

Enformatik Enstitüsü [ ]

Deniz Bilimleri Enstitüsü [ ]

YAZARIN

Soyadı : GÖKTÜRK
Adı : Nazlınur
Bölümü : Yabancı Diller Eğitimi

TEZİN ADI (İngilizce) : "Every Student didn't Learn English" The Acquisition of Scope by L2 Learners of English

TEZİN TÜRÜ : Yüksek Lisans [x] Doktora [ ]

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. [x]

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: