

MISMATCHES IN SUBJECT VERB AGREEMENT:
THE PROCESSING PERSPECTIVE

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THE PROCESSING PERSPECTIVE**

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ABSTRACT

MISMATCHES IN SUBJECT VERB AGREEMENT: THE PROCESSING PERSPECTIVE

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This study investigates the processing of mismatches in subject-verb agreement in Turkish by L1 speakers. Two online experiments were conducted in which agreement mismatches in Turkish were tested with two kinds of subjects: numeral quantifiers and comitative constructions, which did not cause ungrammaticality in the sentence. Both experiments were self-paced reading tasks on the Ibex Farm platform. Experiment I tested which subject-verb agreement pattern was easier to process in items with numeral quantifier subjects, e.g., *üç kişi* ‘three persons’; the matching pattern was 3rd person singular (or plural) morphology on the verb, but two other patterns, 1st and 2nd person plural, were possible as a mismatch condition. It indicated that 1st person plural verbal agreement was easiest to process with numerally quantified subjects, and this goes counter to the common assumption that numeral quantifiers agree with 3rd person singular (or plural). Experiment II compared the processing of two interpretations of comitative construction, e.g., *Ali’yle ben* ‘I and/with Ali’: symmetrical and asymmetrical. The symmetrical interpretation, in which the comitative phrase is interpreted as a coordinated phrase, was deemed a mismatch condition, while the

asymmetrical interpretation, in which the prepositional phrase *Ali'yle* 'with Ali' is analyzed as an adjunct on the subject *ben* 'I' was a match condition. It demonstrated that comitative construction subjects were mostly interpreted as a coordinate structure, which is surprising because Turkish has bona fide coordination headed by the conjunction *ve* 'and'. Both experiments showed that mismatch conditions were favored by the participants. To discover whether this preference for agreement mismatches is specific to these two phenomena, other agreement mismatches should be studied.

Keywords: subject-verb agreement, agreement mismatches, numeral quantifiers, comitative construction, sentence processing.

ÖZ

ÖZNE YÜKLEM UYUMUNDAKİ UYUŞMAZLIKLAR: İŞLENME PERSPEKTİFİ

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Bu çalışma, özne-yüklem uyumundaki uyumsuzlukların birinci dil olarak Türkçe konuşmacıları tarafından işlenmesini incelemektedir. Türkçe uyum uyumsuzlukların iki tür olay bakımından test edildiği iki çevrimiçi deney yapılmıştır: sayısal niceleyiciler ve komitatif yapılar. Bu deneyleri diğer uyum uyumsuzluk çalışmalarından farklı kılan, deneysel ögelerde gözlemlenen uyum uyumsuzluklarının dilbilgiselliğe aykırı bir duruma neden olmamasıdır. Her iki deneyde Ibex Farm platformunda Kendi-Hızıyla Okuma deneyi kullanılmıştır. İlk deneyde, hangi özne-yüklem uyuma örüntüsünün, sayısal niceleyicinin özne olduğu ögelerde işlenmesinin daha kolay olduğunu test ettim. Örneğin, *üç kişi* için eşleştirme örüntü yüklem üzerinde üçüncü tekil (veya çoğul) kişi idi, diğer iki olası kalıp da, birinci ve ikinci çoğul kişiydi ve bu iki kalıp uyum uyumsuzluğu olarak kabul edildi. Deney I, birinci çoğul kişi yüklem uyumunun, sayısal niceleyici öznelerle işlenen en kolay yapı olduğunu gösterdi ve bu, sayısal niceleyicilerin üçüncü tekil kişi veya çoğul kişi yüklem ile uyması genel varsayımına ters düşmüştür. Deney II, komitatif yapı öznelerinde, örneğin *Ali'yle ben*, iki yorumunun işlenmesini karşılaştırdı: simetrik ve asimetrik. Simetrik bakış açısı, komitatif yapı içeren cümlelerin koordine eden bağlaçlı bir cümle olarak yorumlandığı bir uyumsuzluk koşulu olarak kabul edilirken,

asimetrik bakış açısı ise *Ali'yle ben* yapısındaki *Ali'yle* öbeğinin *ben* öbeğine tamamlayıcı öge olarak analiz edildiği eşleşme koşuluydu. Deney II, komitatif yapılı öznelerin bağlaç olarak en kolay şekilde yorumlandığını gösterdi; bu, Türkçe'nin, ve bağlacının baş olduğu bir koordine yapısına sahip olduğu göz önüne alındığında şaşırtıcıdır. İki deney de, uyumsuzluk koşullarının katılımcılar tarafından daha çok tercih edildiğini gösterdi. Bu uyum uyumsuzlukları tercihinin incelediğim iki olaya özgü olup olmadığını keşfetmek için, diğer uyum uyumsuzlukları üzerinde çalışılmalıdır.

Anahtar Kelimeler: özne-yüklem uyumu, uyum uyumsuzlukları, sayısal niceleyiciler, komitatif yapılar, cümle işleme.

To my grandmother Emine Özay



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LIST OF ABBREVIATIONS

*	Shows an expression that a native speaker judges as ungrammatical
1PL	1 st person plural
1SG	1 st person singular
2PL	2 nd person plural
2SG	2 nd person singular
3PL	3 rd person plural
3SG	3 rd person singular
ACC	Accusative
ANOVA	Analysis of Variances
asym	Asymmetrical
AUX	Auxiliary
CLL	Classifier-like Element
COM	Comitative
COND	Conditional
CSC	Coordinate Structure Constraint
DAT	Dative
DP	Determiner Phrase
ERP	Event-related Potentials
FEM	Feminine
GEN	Genitive
GER	Gerund
IMP	Imperative
INSTR	Instrumental
L1	First Language
LOC	Locative
MAD	Absolute Deviations around the Median
MASC	Masculine
ms	Millisecond

N	Noun
NEG	Negation
NMZ	Nominalizer
NOM	Nominative
NP	Numeral Pronouns
NQ	Numerally Quantified
P	Preposition
PF	Present Perfect
PAST	Past Tense
PERF	Perfective
PL	Plural
POSS	Possessive
PP	Prepositional Phrase
PRES	Present
PROG	Progressive
Q	Question Particle
RT	Reaction Time
SD	Standard Deviation
SG	Singular
SPRT	Self-paced Reading Task
SRC	Subject Relative Clause
sym	Symmetrical
VP	Verb Phrase

CHAPTER 1

GENERAL INTRODUCTION

Agreement is a broad phenomenon across languages, which expresses the concord between nouns and adjectives or determines, as in *that student* vs. *those students* and between nouns and verbs as in *she walks* vs. *you walk* (Nevins et al., 2007). The agreement relation involves two elements: the controller and the target (Corbett, 2009). The controller refers to the component controlling the agreement; in subject-verb agreement, it is a determiner phrase (DP) or subject, while the target is the element affected by the agreement morphology, the verb. Though a distinct agreement morphology pattern exists for every language and the patterns vary cross-linguistically, agreement generally follows the dependency paradigm among Person, Number and Gender, and most languages depend on two of these factors in agreement morphology (Mancini et al., 2011; Mancini et al., 2014). These factors are called *agreement conditions* (Corbett, 2009). The feature of number renders the meaning of singular and plural, while the person feature is used to refer to the status of the subject regarding the participant. The person feature provides information about the inclusion of the speaker (the first person), or inclusion of the listener and the exclusion of the speaker (the second person), or exclusion of both the speaker and the listener (the third person) (Jakobson, 1957; Sigurdsson, 2009). According to the Greenberg's Feature Hierarchy (Greenberg, 1963), the person condition is the one which occupies a higher position than the others, and the Person factor is followed by the Number and Gender (Person > Number > Gender). Moreover, when Person feature is investigated on its own, it has been found that there is a difference between the 1st and 2nd person vs. 3rd person with the 3rd person being dominated by others (1st/2nd > 3rd) (Silverstein, 1985).

When a feature is higher on a person hierarchy, the likelihood that it functions as the subject of a sentence increases (Brown et al., 2004).

Agreement dependency takes place based on the syntactic build-up of the sentence regardless of semantic and pragmatic information (Chomsky, 1993; Chung, 1998; Mancini et al., 2011). In other words, in the syntactic build-up of a sentence, the agreement process is completed regardless of the discourse functions of the parts of the sentence. This account reduces agreement to feature checking between the subject and the verb in the operation *Agree*, which targets both person and number feature (Chomsky, 2000). Chomsky (2000) defines *Agree* as an operation in which a probe (the target of the agreement) looks for a goal (the controller of the agreement) within its c-command domain, and after the probe finds the goal, the feature values of the goal are copied onto the probe. However, sometimes agreement takes place even though there is no consistency between the feature specification on the subject and the verbal morphology. This is called an *agreement mismatch*. A simple example of the agreement mismatch is given in (1), where the third person *singular* noun *government* agrees with the verb which shows third person *plural* morphology.

(1) The government meet every Monday.

Such agreement mismatches are not predicted by the syntactic account of *Agree* (Chomsky, 2000). This is why psycholinguistic evidence in terms of real-time processing of a structure is needed to supplement traditional methods of descriptive grammar (Kırkıcı & Clahsen, 2013).

The research on mismatches of the subject-verb agreement has drawn the attention of many authors across languages: English, Turkish, Spanish, Dutch and French (Bock & Miller, 1991; Bock et al., 1999; Lago et al., 2015; Lago et al., 2019; Pearlmutter et al., 1999; Vigliocco et al., 1996, among others). The most prominent studies of the agreement mismatches concern *agreement attraction* phenomenon (Bock & Miller, 1991; Lago et al., 2015; Lago et al., 2019; Nicol et al., 1997; Pearlmutter et al., 1999, Wagers et al., 2009). Agreement attraction refers to a rule-governed or a structured

deviation from the widespread agreement pattern, which is also called *broken agreement* by Bock and Miller (1991). In other words, the attraction may occur when an agreement-bearing element (e.g., the verb) matches a nearby, but grammatically incorrect distractor instead of matching its grammatical controller (Wagers et al., 2009). To illustrate, in the sentence, *The key to the cabinets are on the table*, the agreement-bearing element, *are*, erroneously matches the closest plural element *cabinets* (the intervening noun) yielding the agreement mismatch, which results in ungrammaticality (Bock & Miller, 1991). Agreement attraction studies test whether in the processing of agreement mismatches, the speakers notice the ungrammaticality or not.

The agreement attraction studies mostly focus on the complex DPs consisting of a head noun and a local noun (Bock & Miller, 1991; Bock et al., 1999). In their seminal study, Bock and Miller (1991) their participants to complete sentences given to them.¹ The experimental items belonged to one of two conditions. In the *mismatch* condition, the subject was a complex DP; the head noun was singular, and the local noun was plural as in (2a), or the head noun was plural and the local noun was singular, as in (2d). In the *match* condition, both the head noun and the local noun were either plural or singular, illustrated in (2b) and (2c).

- (2) a) The key to the cabinets ...
 b) The keys to the cabinets ...
 c) The key to the cabinet ...
 d) The keys to the cabinet ...

In the second experiment, the subject was modified by subject or object relative clauses, as shown in (3).

- (3) a) The boys that liked the snake....
 b) The soldiers that the officers accused...

¹ Bock and Miller (1991) conducted three different experiments. For the sake of this thesis, I mentioned only the first experiment as other two were about animacy of the subjects.

The findings have indicated that the participants tend to produce more agreement errors in the mismatch condition in (2a), than in the match conditions in (2b) and (2c). In other words, as the presence of a plural noun in (2a) attracts the speakers' attention, and they erroneously choose the plural agreement on the verb. Interestingly, the same difference did not arise when the head noun was plural and the local noun was singular, in (2d).

Along these production studies, sentence comprehension studies indicate the same pattern (Nicol et al., 1997; Pearlmutter et al., 1999; Pearlmutter, 2000; Staub, 2009). Pearlmutter and colleagues (1999) conducted a self-paced reading task to see whether agreement mismatches affect comprehension. They presented sentences with complex DPs and a mismatch between the local noun and head noun, with grammatical and ungrammatical agreement patterns, in four presentation conditions, shown in (4).

- (4)
- a) The key to the cabinet was rusty from many years of disuse.
 - b) The key to the cabinets was rusty from many years of disuse.
 - c) *The key to the cabinet were rusty from many years of disuse.
 - d) *The key to the cabinets were rusty from many years of disuse.

Two different mismatch conditions, in (4b) and (4d), were presented: the former grammatical and the latter ungrammatical. The findings showed that the reading time of the sentences with mismatches is longer than of those without mismatches, and that ungrammaticality (a mismatch between the subject and the verb) causes additional processing load when compared to grammaticality. This comprehension task also supports the sensitivity towards the agreement mismatch condition.

Pearlmutter (2000) also conducted an agreement attraction study in which he increased the number of nouns in the complex DP subjects, as shown in (5).

- (5)
- a) The lamp near the painting of the house was...
 - b) The lamp near the painting of the houses was ...
 - c) The lamp near the paintings of the house was ...

d) The lamp near the paintings of the houses was

It was a comprehension study with a self-paced reading task, in which the participants were asked to read the sentences. Two experiments were conducted: in the first one, each of these subject phrases appeared with a *singular* head, a singular verb, and a distracting prepositional phrase or phrases, as in (5), while in the second one, a plural head noun was used with a plural verbal agreement, as in (6).

- (6)
- a) The lamps near the painting of the house were...
 - b) The lamps near the painting of the houses were...
 - c) The lamps near the paintings of the house were...
 - d) The lamps near the paintings of the houses were...

The author has observed the effect of the mismatch in this study. Moreover, he concluded that the number marking on mismatching distractor nouns is not the factor that disturbs the agreement, but that the number of the elements which need to be processed for feature checking plays a role in processing: the more elements need to be processed for feature checking, the harder it is to process the structure, and an interference occurs. In the study, the participants had to check the second and the third element for possible determiner and noun agreement and it caused extra processing load for the speakers. Also, the effect of structural hierarchy was observed in the second study: the elements hierarchically closer to the verb affected agreement more than the hierarchically distant ones.

To summarize, both in the production and comprehension of agreement mismatches in real-time processing where the mismatch causes ungrammaticality, speakers tend to be sensitive to a possible mismatch.

The research reported in this thesis is similar to agreement attractions studies in that it also investigates agreement mismatches. However, there is an important difference: while agreement mismatches investigated in attraction studies are ungrammatical, in

my study, they yield grammatical sentences.² The *mismatch* refers to the fact that the subject phrases in question look as if they should obligatorily induce, e.g., third person singular agreement on the verb, but they sometimes agree with the verb that shows e.g., first and second person plural agreement. The possible agreement patterns indicate different structures of the subject: one that closely corresponds to the surface string (the one inducing third person agreement) and one that is syntactically (albeit not phonologically) more complex (the one inducing first or second person agreement).

In subject-verb agreement, there are two different models in which the match between the subject DP and the verb is reached: a bottom-up model and a top-down model (Nevins et al., 2007). In the bottom-up model, agreement processing waits until the verb morphology is encountered to provide the match condition. In other words, the verb should be processed before it can be decided whether it meets the match condition. On the other hand, the top-down strategy says that before the appearance of the verb, the agreement processing can begin. That is, the subject DP gives the relevant information for the agreement processing, and the agreement morphology on the verb is created by the speaker predictively. In this model, the verb is not needed to decide on agreement processing. Instead, the speaker checks the verb to identify whether it is suitable for the prediction they made based on the subject. When the two models are compared, the top-down model is the favored one among the authors (Crocker, 2012; Frazier & d'Arcais, 1989; Gibson, 1998; Nevins et al., 2007). A top-down model is also called the predictive model as the speakers are required to predict what is upcoming in the sentence (Nevins et al., 2007). In other words, when speakers first detect the DP in the sentence, they make predictions about the verb morphology. If this morphology expectation is not met once the verb is encountered, the participants need to access information that has already been processed and is not being actively processed any more. This is increasingly necessary with the increase of the distance between the subject and the matrix verb. When the distance increases, the

² It is questionable whether mismatches that do not cause ungrammaticality should be called *mismatches*. I chose to call them mismatches because they involve a mismatch between the features of the subject that are detectable on the surface and the features reflected in the verb morphology. I thank Prof. Dr. Bilal Kırkıcı for bringing this to my attention.

computational system needs to activate the retrieval mechanism to reach a full understanding of a sentence (Van Dyke & McElree, 2011). The retrieval mechanism helps to establish long-distance dependencies. When a retrieval mechanism kicks into the system, processing takes longer because the comprehenders need to investigate the all the elements in the sentence to establish the agreement relation.

In predictive processing, speakers integrate what is seen and make predictions about what kind of structure will come next (Altmann & Kamide, 1999; Altmann & Mirkovic, 2009; Kaan, 2014; Levy, 2008; MacDonald, 2013). The pioneering study on predictive processing was conducted by Altmann and Kamide (1999). They conducted an eye-tracking study in which speakers listened to sentences like *The boy will eat the cake*, with pictures of a boy, a toy train, a cake, and a toy car presented on the screen. After hearing the verb, participants' eyes moved to the picture of a cake, which is edible. This performance by speakers gives us an important clue about how a predictive system works. Basically, the predictive relationship that exists among the verb, its context and its arguments shapes the sentence processing (Altmann & Kamide, 1999).

An agreement mismatch arises when the subject and the verb do not match in person, number or gender feature.³ On seeing the subject, speakers expect a certain structure, in particular, agreement morphology on the verb that matches the features of the subject. If this expectation is not met, speakers use the retrieval mechanism and reanalyze the whole structure. This reasoning underlies the design of experiments, reported in this thesis, with which I examined agreement mismatches in Turkish.

1.1. Subject-Verb Agreement in Turkish

Turkish is a head-final agglutinative language. It is also a free-order language, and it has subject-object-verb (SOV) basic sentence structure. The order of the parts of a sentence is mostly defined by discourse requirements (Kornfilt, 2005). Agreement

³ I am taking agreement to target a bundle of features (person, number and gender) rather than taking each of these features as a separate agreement process.

occurs between the subject and the verb in terms of person and number, but not gender since Turkish does not have grammatical gender. Both of these agreement conditions are expressed with one verbal affix, telling us the person and the number feature of the subject. To illustrate, the sentence in (7), the suffix *-m* on the verb *gel* ‘come’ indicates both the person condition: the first person, and the number condition: singular.

- (7) ~~Ben~~ gel-di-m.
 I come-PAST-1SG
 ‘I came.’

Similar to German, French or English, Turkish has 3x2 person and number paradigm, which consists of three different persons (*ben* ‘I’/*biz* ‘we’, *sen* ‘you’/*siz* ‘you.pl’, *o* ‘he/she/it’/*onlar* ‘they’) and two numbers (singular and plural). Turkish person morphology is presented in Table 1, which contains four different suffixal paradigms that exist in Turkish (I through IV).

Table 1. *Turkish Personal Pronouns*

Person	Pronoun	I	II	III	IV
1sg	Ben	-m	-Im	-	-(I)m
2sg	Sen	-n	-sIn	-Ø	-(I)n
3sg	O	-Ø	-Ø	-	-(s)I(n)
1pl	Biz	-k	-Iz/Im	-	-(I)mIz
2pl	Siz	-niz	-sInIz	-In(Iz)	-(I)nIz
3pl	Onlar	Ø / -lar ⁴	(-lar)	-	-(lAr)I(n)

(Aydın et al., 2016, p. 285)

The difference among the paradigms stems from morphological selectivity. The suffixes in paradigm (I) only select verbal predicates, ending with the affix *-sa* (the conditional suffix) and *-dı* (the past tense suffix). This paradigm is called the “*k-*

⁴ Both are acceptable (Göksel & Kerslake, 2004; Kornfilt, 1997).

(8)

a) Siz	sinema-ya	git-ti- niz .	<i>Paradigm I</i>
you-PL	cinema-DAT	go-PAST-2PL	
'You went to the cinema'			
b) Siz	sinema-ya	gid-(i)yor- sunuz .	<i>Paradigm II</i>
you-PL	cinema-DAT	go-PROG-2PL	
'You are going to the cinema.'			
c) Siz	sinema-ya	gid- in .	<i>Paradigm III</i>
you-PL	cinema-DAT	go-IMP-2PL	
'Go to cinema.'			
d) Siz-in	sinema-ya	git-tiğ- iniz-i	
		bil-mi-yor-lar.	
You-PL-GEN	cinema-DAT	go-NOM-POSS2PL-ACC	know-NEG-PROG-3PL
'They don't know that you are going/went to the cinema.'			
			<i>Paradigm IV</i>

(9) a) Ben sinema-ya git-ti-m. Turkish
 I cinema-DAT go-PAST-1SG
 'I went to the cinema.'

b) Sen sinema-ya git-ti-n.
 you-SG cinema-DAT go-PAST-2SG
 'You went to the cinema.'

c) O sinema-ya git-ti-Ø.
 He/she cinema-DAT go-PAST-3SG

‘He/she went to the cinema.’

- d) Biz sinema-ya git-ti-k.
we cinema-DAT go-PAST-1PL

‘We went to the cinema.’

- e) Siz sinema-ya git-ti-niz.
you-PL cinema-DAT go-PAST-2PL

‘You went to the cinema.’

- f) Onlar sinema-ya git-ti/ler.
they cinema-DAT go-PAST-Ø/3PL

‘They went to the cinema.’

An interesting fact about Turkish agreement concerns 3rd person plural pronoun agreement, which can agree with singular or plural verb. This is illustrated in (10).

- (10) a) Onlar okul-a git-ti-Ø.
they school-DAT go-PAST-3SG

‘They went to the school.’

- b) Onlar okul-a git-ti-ler.
they school-DAT go-PAST-3PL

‘They went to the school.’

The agreement on the verb in Turkish depends on the animacy of the subject, whenever the subject is third person plural: the more animate the plural noun phrase, the more likely it is that the verb with which it agrees will take a plural ending (Bamyacı et al., 2014; Comrie, 1989; Corbett, 2000; Sezer, 1978 among others). It is not acceptable for the verb to carry a plural marker with an inanimate entity as a subject. This contrast is shown in (11a-b).

- (11) a) Çilingir-ler kapı-lar-ı aç-tı-(lar).
locksmith-PL door-PL-ACC open-PAST-3SG (3PL)

‘Locksmiths opened the doors’.

- b) Anahtar-lar kapı-lar-ı aç-tı/*lar.

Turkish

key-PL door-PL-ACC open-PAST-3SG /*3PL

‘Keys opened the doors’.

(Sezer, 1978, p. 26)

The mismatch between the subject and the verb also occurs when the verb morphology does not meet the requirement that Agree needs, as shown in (12). This kind of mismatch creates ungrammaticality.

- (12) *Ben sinemaya git-ti-n.
I cinema.DAT go-PAST-2SG

Turkish

The effect of subject-verb mismatches on processing in Turkish has appealed to several authors (Aygüneş, 2013; Kahraman, 2018; Lago et al., 2019).

Lago and colleagues (2019) investigated agreement mismatches – agreement attraction errors – in German and Turkish monolinguals and bilinguals.⁵ They presented the conditions in which subject phrases were possessives with singular head nouns and genitive modifiers, and the verb carried either singular or plural morphology. The essential aim was to discover how grammar attraction plays a role in the processing of agreement mismatches and its effects on memory retrieval mechanism of native speakers. The authors found that speakers are more likely to accept ungrammatical sentences in which the verb carried plural morphology when the genitive possessor was plural than they were to accept such sentences when both the head noun and the genitive modifier were singular. The authors concluded that the monolingual speakers are less likely to admit ungrammatical sentences than the bilingual speakers, but did not find a significant difference in the rates of attraction.

Like other agreement attraction processing studies, Lago et al. 2019 shows that speakers are sensitive to agreement mismatches. However, when they encounter an ungrammatical sentence featuring a subject-verb agreement mismatch, speakers are more likely to accept the sentence when it contains a target that matches in morphology

⁵ Since bilinguals are not topic of this thesis, I will only focus on the results with native speakers.

(the distractor), even when it is not the subject of the sentence (such as *the key to the cabinets are...*).

Aygüneş (2013) conducted an agreement mismatch study that investigated two issues: (1) the difference between the *k*-paradigm and the *z*-paradigm in Table 1 in real-time processing and (2) the functionality of the feature hierarchy in Turkish. The author used a behavioral experiment (a repair experiment) and two Event-Related Brain Potentials (ERP) tasks. The experimental conditions involved sentences with a subject-verb agreement mismatch, and this mismatch was manipulated in the person and number feature, as shown in (13a). Also, the word order was manipulated to discover the effect of the DP subject and Tense on agreement, as in (13b).

- (13) a) Ben yemeğ-i yap-tı-m/*yap-tı-n/*yap-tı-k/*yap-tı-nız.
 I meal-ACC cook-PAST-1SG/*cook-PAST-2SG/*cook-PAST-PL
 /*yap-tı-nız.
 /*cook-PAST-2PL
 ‘I/*you/*we/*you cooked the meal.’
 b)*Yap-tı-n yemeğ-i ben.
 cook-PAST-2SG meal-ACC I
 ‘I cooked the meal.’

Based on the findings, Aygüneş affirmed that the feature hierarchy exists in Turkish (person > number) in both paradigms because in ERP experiments, a difference was detected in the processing of these two features, which is line with the previous literature. Aygüneş found this difference between person and number hierarchies in the processing of the *k*-paradigm: verbal predicates, ending with the affix *-sa* (the conditional suffix) and *-dı* (the past tense suffix) and *z*-paradigm, comprising the rest of verbal predicates. In other words, the hierarchy between person and number was found across *k*-paradigm and *z*-paradigms. No effect of word order was found. To reach this conclusion, the author presented the conditions in which these features are manipulated. This study also showed a 2nd > 1st person hierarchy, which means that

the processing of the second person needs more cognitive processes than the first person.

Kahraman (2018) conducted a processing study to see whether Turkish native speakers utilize the information obtained from the subject-verb agreement in real-time processing tasks, and whether the presence of subject-verb agreement can cause any benefit or obstacle in the sentence processing. In his study, he presented three different conditions, given in (14). In (14a), the first noun *komutan* ‘commander’ is the embedded clause subject and matches the verb of the embedded clause, but not the verb of the matrix clause. In (14b), the first noun *komutan* ‘commander’ matches the verb of the embedded clause (and also of the matrix clause), but it is the subject of the matrix clause. In the last condition (14c), the noun *komutan* ‘commander’ is also the subject of the matrix verb, but does not match the embedded verb. The prediction is that if Turkish speakers are sensitive to subject-verb agreement mismatches, they will find it harder to process (14c). This is because speakers will first think that *komutan* ‘commander’ is the subject of the embedded verb. When they see plural agreement on the embedded verb, however, they are expected to slow down to reanalyze the sentence and will posit another subject to be the subject of the embedded clause. By contrast, if there is no sensitivity to subject-verb agreement mismatches, there will be no difference among the conditions.

(14) a) [Komutan geç kalktı diye] asker-ler çok kızdı.

commander late got up that soldier-3PL very got angry

‘The soldiers got very angry because the commander got up late.’

Match Subject

b) Komutan [geç kalktı diye] asker-ler-e çok kızdı.

commander late got-up that soldier.3PL.DAT very got angry

‘The commander got very angry because the soldiers got up late.’

Match non-subject

c) Komutan [geç kalktı-lar diye] asker-ler-e çok kızdı.

commander late got up.3PL that soldier.3PL.DAT very got angry

‘The commander got very angry because the soldiers got up late.’

Kahraman found that Turkish speakers are sensitive towards agreement mismatches because the condition in (14c) was read slower than the other two. His findings are in line with previous research showing a slower pace in reading embedded verbs in mismatch conditions. Thus, mismatches between the subject and the verb in Turkish affect the processing and create a higher processing load for speakers. The reason for this processing load is that when speakers encounter a pattern different from what they expect, they need to replace their first prediction (e.g., the noun *komutan* ‘commander’ is the subject of the embedded clause) or preference, and this leads to a slow-down in processing.

As mentioned above, my thesis is different from the abovementioned studies because in my thesis, the mismatch does not differentiate between grammatical and ungrammatical structure, but rather between two separate structures that can be assigned to the subject: one matches the properties that are visible on the subject, and one does not. The details of the study are presented in the next section.

1.2. The Present Study

In Turkish, there are subject-verb agreement mismatches which do not lead to ungrammaticality. In this thesis, I investigate two types of such mismatches: those arising with numerally quantified subjects and those arising with comitative constructions in Turkish. Real time processing of these two mismatches is examined to see what Turkish native speakers prefer when they have two grammatical options to choose from.

Like other third person plural subjects in Turkish, numeral subjects (e.g., *iki kişi* ‘two persons’) are expected to agree with 3rd person singular verbs, or optionally 3rd person plural verbs, as shown in (15).

- (15) Üç kişi gel-di-Ø/ler.
three person come-PAST-3SG/3PL
'Three persons came.'

When a Turkish speaker sees a numerally quantified subject, my expectation is that they expect to see one of the two agreement morphologies mentioned above: 3rd singular or 3rd plural. A subject-verb mismatch in a numerally quantified subject occurs when the subject agrees with a 1PL verb, as in (16a) or a 2PL verb, as in (16b). These mismatches do not cause ungrammaticality, but rather affect the interpretation of the utterance, as indicated by the translations.

- (16) a) Üç kişi gel-di-k.
three person come-PAST-1PL
'We, being three persons, came.'
b) Üç kişi gel-di-niz.
three person come-PAST-2PL
'You, being three persons, came.'

In this thesis, I explored these agreement mismatches through a self-paced reading task. I relied on two assumptions: firstly, that the syntactic structure of the subject is different when it agrees with the 3rd person singular verbs than when it agrees with 1st or 2nd person plural verbs. Second, that when a speaker encounters agreement morphology that is unexpected given the prediction made upon the processing of the subject, they will slow down in order to reanalyze the structure. Thus, for example, if speakers expect a 3rd person agreement, but they meet 1st or 2nd person, or vice versa, the unexpected morphology will cause a surprise because of the agreement mismatch.

The second experiment in this thesis investigates the agreement mismatch between the subject noun phrase that is a comitative construction, and the verb. The comitative construction consists of two nouns related to one another with a comitative marker, as in (17) for English.

(17) John with Mary

The primary function of a comitative construction is to signal accompaniment or instrumentality. When the comitative phrase signals accompaniment, the two nouns in the comitative construction do not have equal rank in the event; one is more prominent than the other, i.e., the construction is interpreted *asymmetrically*, as shown in (18). In such a case, the verb agreeing with a comitative subject is expected to be singular because the second participant (*Ahmet* in (18)) has just the function of the accompaniment and is attached to the sentence/subject noun phrase as an adjunct.

(18) I went to the cinema *with Ahmet*.

However, in some languages, such as Turkish, Polish, or Russian, the comitative construction may also function as a coordinate phrase, in which case the two noun phrases have equal status in the event. In such examples, where the comitative is interpreted *symmetrically*, the verb surfaces with plural agreement, as in (19) from Polish. The presence of the plural verb agreement with a comitative construction subject is interpreted as an agreement mismatch because the expectation for a comitative construction is assumed to be the singular agreement on the verb.

(19) Janek z Ewa poszli na spacer. *Polish*
Janek.NOM with Ewa.INST went.3PL.FEM for walk
'Janek and Ewa went for a walk.'
(Dyla, 1988, p. 383)

In Turkish, the comitative construction can be used asymmetrically, with one of the noun phrases being part of a preposition phrase, which is used as an adjunct. Such asymmetrical reading establishes inequality between the participants, as shown in (20a). On the other hand, the comitative construction may function as a coordination phrase, in which both participants are assigned equal roles, and therefore a symmetrical reading occurs, as in (20b). The two readings of a comitative are disambiguated by the agreement morphology on the verb: singular in (20a) and plural

in (20b). This thesis compared the processing of the two constructions in (20) to find out which one is easier to process.

- (20) a) Ayşe ile ben sinema-ya git-ti-m. [asym] Turkish
Ayşe.NOM with I cinema-DAT go-PAST.1SG
'I went to the cinema with Ayşe.'
- b) Ayşe ile ben sinema-ya git-ti-k. [sym]
Ayşe.NOM with I cinema-DAT go-PAST-1PL
'Ayşe and I went to the cinema.'

The two agreement mismatch phenomena, the numerally quantified subjects and the comitative construction, are explored separately. Therefore, the research questions and the hypothesis pertaining to each of these phenomena appear separately in the following chapters, which are as follows: Chapter 2 concerns numerally quantified subjects in Turkish. In this chapter, I present the background on numeral quantifiers, introduce the research questions, design and methods of the experiment in which I investigated agreement with numerally quantified subjects, and I discuss the findings. Chapter 3 regards the comitative construction in Turkish. There, I familiarize the reader with the comitative construction cross-linguistically and in Turkish, I state my research questions, and present the experiment in which I tested the ease of processing of the two readings of the comitative construction (symmetrical and asymmetrical). Chapter 4 is the general discussion, in which I discuss the findings of both of these agreement mismatch experiments and their repercussions. I conclude this chapter (and the thesis) with a conclusion.

CHAPTER 2

EXPERIMENT I:

NUMERAL QUANTIFIERS AND NUMERAL PRONOUNS

In this chapter, I explore the behavior of Turkish numeral quantifiers and numeral pronouns with respect to subject-verb agreement. I first give brief information about possible interpretations of a numeral quantifier. I also define a numeral pronoun. Next, I discuss numeral quantifiers and numeral pronouns in Turkish and describe the difference between them. Then, I discuss the significance of the present study. I next present the research questions and expectations that guided my Experiment on agreement mismatches with numeral quantifiers and numeral pronouns (Experiment 1). I then report the experiment (participants, materials, methods, analysis, and results) and I end the chapter by discussing the findings.

2.1. Background

2.1.1. Quantifiers

Quantifiers consist of numerals or words which establish the scope of a determiner phrase (DP), and they represent the knowledge of the abstract number, which is transmitted through the context or the sentence (Jiang et al., 2009). For instance, in a sentence *three people came*, the quantifier *three* identifies the following noun *people* in terms of the number quality. Quantifiers can be grouped into two categories.

Quantifiers like *every* or *all* determine a subtype of quantifiers named *universal/distributive quantifiers* (Berent et al., 2008; Brendel, 2019; Gleissenthall et al., 2016; many others). When these quantifiers are used, the features described in the noun are available for each member of the noun. To illustrate, the quantifier *all* in the sentence *all the students are successful* refers to a unified group, and the quantifier *each* in the sentence *each student is successful* has a distributive meaning assigning each member a unique interpretation. In both cases, the property of being successful is ascribed to all members of the group. Quantifiers like *a* or *some* are called *existential quantifiers* (Dékány & Csirmaz, 2018). They indicate that at least one participant of a group performs the action denoted by the predicate.⁶

In addition to these two types of quantifiers, one more category exists: numeral quantifiers.⁷ The reason why it is in a distinct category is that it defines a specific number of participants. Furthermore, when the number of participants is not one, all quantifiers, including numerals, introduce plural entities regardless of whether they are morphologically plural or not. Since such quantifiers always denote a group, they are generally followed by plural nouns, as shown in (21a) and (21b) (Carey, 2004; Li et al., 2003).

- | | | |
|------|-----------------|----------------------|
| (21) | a) all students | <i>English</i> |
| | b) zwei Frauen | <i>German</i> |
| | two woman.PL | |
| | ‘two women’ | (Dipper, 2005, p. 1) |

⁶ Previous research also indicated another classification that includes numerals (Beghelli, 1997). This grouping consists of three categories: the *distributive-universal* quantifier phrase (QP), the *group denoting* quantifier phrase and the *counting* quantifier phrase. The distributive-universal QP refers to the quantifiers with singular agreement: *every* and *each*. The group denoting QP includes indefinites, bare numerals and partitives and the counting QP refers to modified numerals such as *fewer than four students* or *more than two books*.

⁷ Although some research assumes numerals to be a distinct category, not quantifiers (Barner et al., 2009; Dékány & Csirmaz, 2018), for the purpose of this study I will assume that they are quantifiers (Özyıldız, 2017).

2.1.2. Numeral Quantifiers

Numeral quantifiers are the representation of an abstract number used to define the count of a noun in a sentence or a context. As I mentioned above, they represent a specific number of a group of people or objects.

Though numerals define a specific number of (an) object(s), they may have different interpretations based on the context. To clarify, numerals are sorted on a scale from the weak interpretation to the strong one (Shetreet et al., 2014). For example, in (22), the numeral has a strong interpretation and means ‘three, not more or less than that’, while in (23) the numeral means ‘at least three.’

(22) Three dogs in this neighborhood bark at night.

(23) If three dogs in this neighborhood bark at night, we won’t get enough sleep.
(Shetreet et al., 2014, p. 854)

In addition to these two interpretations: ‘exactly x’ and ‘at least x’, numerals can be used to express the meaning of ‘at most’ (Carston, 1998, Shetreet et al., 2014; Spychalska et al., 2019, many others), as shown in (24).

(24) You can make three mistakes and still pass the test.

(Shetreet et al., 2014, p. 855)

In the present study, numerals were used in sentences like (25), where they were most naturally interpreted as denoting the exact number.

(25) Üç kişi bu havuz-da yüz-üyor-du-Ø daha geçen hafta.
three person this pool-LOC swim-PROG-PAST-3SG just last week.
*‘Three person was swimming in this pool just last week.’

2.1.3. Subject-Verb Agreement with Numerally Quantified Subjects

There is no unified requirement across languages for numeral quantifiers to appear with plural agreement on the verb (regardless of whether this plural is morphologically marked or not), but it is agreed that regardless of whether or not the noun that is modified by the quantifier shows plural morphologically, numeral quantifiers carry plural meaning (Matushansky & Ionin, 2016).

Languages are divided into two categories based on whether the nouns in a numeral phrase carry an overt plural marker or not (Alexiadou, 2019; Bayırlı, 2017; de Swart & Farkas, 2010; Ortman, 2000; Sağ, 2018 and among others). While some languages do morphologically mark the nouns with numerals as plural: the ‘Type English’ languages, such as German, shown in (26a) and (26b), others do not use any plural marker for the nouns: the ‘Type Hungarian’ languages, such as Basque, Kurdish or Turkish, illustrated in (27a) and (27b) (Ortman, 2000).

- | | | | |
|------|--------------------------|------------------------------------|----------------|
| (26) | a) das groß-e Haus | b) die drei große-en Häus-er | <i>German</i> |
| | df.SG huge-SG house | df.PL three huge-PL house.PL | |
| | ‘the huge house’ | ‘the three huge houses’ | |
| | | (Ortman, 2000, p. 250) | |
| (27) | a) eski kitap | b) üç eski kitap | <i>Turkish</i> |
| | old book.SG | three old book.SG | |
| | ‘old book’ | ‘three old books’ | |

‘Type English’ languages mark the verb agreeing with the subject with a plural marker, as in (28a), while the verb in ‘Type Hungarian’ languages (apart from Kurdish) is not capable of agreeing with the subject despite the existence of a plural context, as illustrated in (29b). In other words, ‘Type Hungarian’ languages (except for Kurdish) lack the capability of indicating plural agreement on the verbs when the numerals or quantifiers appear in the subject position. In these languages, the lexical head noun,

which is singular and modified by a quantifier, governs the agreement between the subject and the verb.

- (28) Three students were in the class. *English*
- (29) a) (Az) öt nagynéni sort isz-ik /*isz-nak. *Hungarian*
(df) five aunt beer drink-3SG / drink-3PL
'(The) five aunts are drinking beer' (Ortmann, 2000, p. 254)
- b) Sami ḳnuṭi goravs *Georgian*
three kitten roll.3SG
'Three kittens are rolling' (Harris, 1981: 22)

The fact that in 'Type Hungarian' languages, only one overt realization of plurality is present in DPs is explained by the Principle of economic plural marking (Ortmann, 2000), defined in (30).

- (30) Principle of Economic Plural Marking (PEPL)
There is no more than one realisation of [+pl] within the DP.
(Ortmann, 2000, p. 266)

Applied to Turkish, PEPL explains why a numeral phrase with a plural feature modifies a singular noun. To illustrate, in the DP *üç kişi* 'three person', *üç* 'three' carries a plural feature and so *kişi* 'person' does not need to (and in fact cannot) carry any plural feature.

In addition to PEPL, in his optimality theory analysis of agreement, Ortmann (2000) proposes two more constraints: Unification and Map, which play a role in DP external agreement. He defined them as follows:

- (31) Unification
Categories in a syntactic agreement relationship have compatible values with respect to agreement features (gender, number, person).
(Ortmann, 2000, p. 267)

(32) Map

Semantic properties of individuals are reflected by a corresponding morphosyntactic feature specification in the output. (Ortmann, 2000, p. 267)

Examples from Georgian in (33a) and (33b) show that a sentence with a numerally quantified subject violates Unification if the verb carries plural morphology, and it violates Map when the verb carries singular morphology.

(33) a) [sami knut-i] gorav-en *Georgian*

three kitten-NOM roll-3PL

[-pl]

[+pl]

X

* ! unification

b) [sami knut-i] gorav-s

three kitten-NOM roll-3SG

[-pl]

[+pl]

* ! map

(Ortmann, 2000, p. 277)

A hierarchy between these two constraints exists such that Unification dominates Map (unification > mapping). This analysis, proposed originally for Hungarian, could also explain why in Turkish 3rd singular agreement on the verb is more acceptable than 3rd plural agreement with numeral quantifiers.

In addition to ‘Type English’ and ‘Type Hungarian’ languages, in some languages, such as Polish, numeral quantifiers differ in the agreement on the verb depending on the number used in the phrase (Matushansky & Ionin, 2016). In other words, numerals equal to or higher than five do not control agreement, although this is not the case for the numbers lower than five: two, three and four. The latter control agreement and provides a plural feature on the verb as in (34a) and (34b).

(34) a) Dwie dziewczyny przyszły. *Polish*

two.FEM.NOM girl.PL.NOM came.NV.PL⁸

‘Two girls came.’

b. Pięć dziewczyn/kotów przyszło.

five.NV NOM girl.PL.GEN/cat.M.PL.GEN came.N.SG

‘Five girls/cats came.’

(Matushansky & Ionin, 2016, p. 1)

The same phenomenon exists in Russian, but this time agreement occurs on the noun of the nominal phrase. If the numeral in the phrase is *one*, then the noun is singular and nominative and the numeral agrees with the noun in gender, as shown in (35a). If the number is between two and four – a paucal number – then the noun is singular and carries genitive case, and no gender agreement occurs in paucal numbers, as in (35b). Finally, if it is higher than five, then the noun is plural and carries genitive case, and gender agreement on the numeral does not occur, as shown in (35c).

- (35) a) odn-a devočk-a b) tri devočk-I *Russian*
 one.fem girl.NOM.SG three girl.GEN.SG
 ‘one girl’ ‘three girls’
 c) šest’ devoček
 six girl.GEN.PL
 ‘six girls’ (Xiang et al., 2011, p. 549)

Also, if a numeral phrase carries a genitive case, then the verb can carry singular or plural morphology, as in (36). This is similar to Turkish example (37), repeated from (10). However, the case on the noun following a numeral is always nominative in Turkish.

- (36) Pjat’ devušek rabotali/rabotalo tam. *Russian*
 five girls.GEN work.PAST.PL/SG there
 ‘Five girls worked there. (Bošković, 2006, p. 99)
(37) a) Onlar okul-a git-ti-Ø. *Turkish*
 they school-DAT go-PAST-3SG

⁸ The gloss NV represents the non-virile condition, which means a group not including males.

‘They went to the school.’

- b) Onlar okul-a git-ti-ler.
they school-DAT go-PAST-3PL
‘They went to the school.’

In previous literature, few studies (Polinsky & Potsdam, 2013; Xiang et al., 2011) focused on mismatches of this type of Russian numeral constructions. Xiang and colleagues (2011) examined the processing of the structures in (35) by manipulating the case on the noun following the numeral. They created mismatches by changing the agreement requirements on noun as shown in (38).

- (38) a) *odin malen’kij mal’cik*
one.NOM little.NOM.SG boy.NOM.SG
‘one little boy’
b) *odin malen’kij *mal’cika*
one.NOM little.NOM.SG boy.GEN.SG
‘one little boy’
c) *odin malen’kij *mal’ciki*
one.NOM little.NOM.SG boy.NOM.PL
‘one little boy’
d) *odin malen’kij *mal’cikov*
one.NOM little.NOM.SG boy.GEN.PL
‘one little boy’

The same case manipulation on the noun was applied to two other numeral groups: numbers from two to four and numbers higher than five. The participants showed slower reaction time in the sentences with numeral-noun agreement mismatch compared to the match one. Xiang and colleagues (2011) concluded that speakers are sensitive to case/number agreement mismatches.

Another study by Polinsky and Potsdam (2013) also examined the processing of Russian numerical constructions. Their focus was on paucal (numbers 2-4) and higher

numbers and their agreement with the noun that they modify. The authors also concluded that the speakers are sensitive to morphological mismatches. Although there has been no manipulation on the verb in these two experiments, their findings of the sensitivity for a mismatch in a numeral phrase are important for the current experiment, because they show that speakers are sensitive to agreement violations in numerally quantified phrases.

What my experiment examines is subject-verb agreement mismatches with manipulations on the verb. However, while in the above mentioned studies some of the mismatched conditions caused ungrammaticality, verb agreement manipulations in my experiment do not lead to ungrammaticality, but require different interpretations of the subject. This makes my experiment unique and my findings significant.

2.1.4. Numeral Pronouns

The numeral (numerical or numeric) pronoun refers to a cardinal number (five or six) or an ordinal number (third or fifth) that is utilized to specify the number of an object by replacing the noun in the phrase (Glosbe, n.d.) as shown in (39).

- (39) There were twenty students in the class. Five were males, and the rest were females.

Numeral pronouns are widely used across a variety of languages. An example from Tümpisa Shoshone is shown in (40).

- (40) Wahattu pittuhungkwa, sumuttu urn punikka. *Tümpisa Shoshone*
 two arrived one you see
 'Two arrived, one saw you. ' (Dayley, 1989, p. 167)

2.1.5. Numeral Quantifiers in Turkish

Numerals in Turkish are classified as modifiers, mentioned as adjectives in the literature (Göksel & Kerslake, 2004; Kornfilt, 1997; Koşaner, 2006; Lewis, 1967; Özyıldız, 2017).

Numeral quantifiers in Turkish precede a singular noun, as shown in (41a). The nouns never appear with a plural suffix. In other words, despite the existence of the plural meaning, the head noun cannot carry an overt plural marker. This is shown in (41b) (Göksel & Kerslake, 2004; Kornfilt, 1997; Sağ, 2018).

- (41) a) üç kitap Turkish
three book
'three books'
b) *üç kitap-lar
three book-PL
'three books'

The phrase *üç kitap* 'three book' behaves in the same way in which the numeral phrase *three books* behaves in English. It is the idiosyncrasy of Turkish syntax (discussed already in the previous chapter) that it may or may not show plural agreement in the third person, as shown by the singular form of the verb whose subject is a numerally quantified phrase in (42). However, having a singular DP does not mean that the phrase does not denote plurality. Although the noun cannot carry a plural marker, the meaning of the numeral phrase is plural. An indication of it is that when a quantified subject is referred to in a following context, a plural pronoun is used to refer to it since the antecedent is a plural entity, as shown in (42).

- (42) Ali üç kitap satın aldı. Onlar/*o genç bir adamı betimliyorlar.
Ali three book buy.PAST.3SG. They/*it young a guy.SPEC describe.PROG.3PL
'Ali bought three books. They describe a young guy.'

In Turkish, numerals that quantify count nouns do not need a classifier-like element (CLL), unlike in Korean and Japanese (Bošković & Şener, 2014; Öztürk, 2005), where the classifier is not obligatory, but optional. However, CLL can take place in a sentence, and it gives the meaning of individuating as shown in (43) (Öztürk, 2005).

- (43) üç tane elma
 three CLL apple
 ‘three (piece of) apples’

A quantified subject may appear in the subject or object position, as shown in (44a) and (44b) respectively.

- (44) a) Dört öğrenci gel-di Turkish
 four student come-PAST-3SG
 ‘Four students came.’
 b) Ben bugün üç defter al-dı-m.
 I today three notebook buy-PAST-1SG
 ‘I bought three notebooks today.’

A feature of Turkish is that bare singulars are referred to as *strict singular* whereas bare plurals are claimed to be *number-neutral*. For example, *bir elma* ‘an apple’ in Turkish means the same as *an apple* in English; the singularity of this structure is certain. On the other hand, bare plurals *elmalar* ‘apples’ in Turkish or *apples* in English are free of number. The number is determined when the noun is specified. Nevertheless, these two languages differ in that in English, overt indication of plural agreement is shown on the noun and on the verb, as in (45). However, in Turkish, the plural marker on the noun is not overt and the plural marker on the verb is optional as in (46).

- (45) Three speakers participate in every experiment.

- (46) Dört öğrenci gel-di-Ø/gel-di-ler. Turkish
 four student come-PAST-3SG/come-PAST-3PL

‘Four students came.’

The animacy paradigm in Turkish, in which the more animate the plural noun phrase, the more likely it is that the verb with which it agrees will take a plural ending, is also true when the subject is a numerally quantified phrase. Even though DP-internally there is no plural marker on the noun regardless of whether the noun denotes an animate or an inanimate entity, the agreement on the verb follows the same pattern: The plural agreement with an animate subject in (47a) is much more acceptable than the one with an inanimate subject in (47b).

- (47) a) Üç polis kapı-nın önünde dur-uyor-Ø(lar).
three cop door-GEN in front of stand-PROG-3SG(3PL)
‘Three cops are standing in front of the door.’
b) Üç koltuk kapı-nın önünde dur-uyor- Ø(??lar).
three seat door-GEN in front of stand-PROG-3SG(?3PL)
‘Three seats are standing in front of the door.’

In my experiment, the subjects were numerally quantified phrases in which the noun was always *kişi* ‘person’. Such DPs generally agree with 3SG verbs, as in (48a), but sometimes it is possible to see them agree with 3PL verbs, as in (48b) (Göksel & Kerslake, 2004; Kornfilt, 1997). In my experiment, sentences like (48a), where the numerally quantified plural subject agrees with a 3SG verb represents the so-called *match condition* because the number marking on the verb, due to the idiosyncrasy of Turkish grammar, matches the features of the subject.

- (48) a) Üç kişi gel-di.
three person come-PAST-3SG
‘Three persons came.’
b) Üç kişi gel-di-ler.
three person come-PAST-3PL
‘Three persons came.’

When the sentences are examined in terms of inclusive or exclusive readings (readings that include or exclude the speaker or the hearer), both examples in (48) exclude both the first person, *I*, and the second person, *you*, from the group referred to by *üç kişi* ‘three persons’.

On the other hand, Turkish allows a *mismatch* in person agreement when the verb agrees with a quantified subject. Thus, besides 3rd person agreement, the verb may show 1PL agreement, as in (49a), and 2PL agreement, as in (49b). Both of these conditions illustrate *mismatch conditions* in subject-verb agreement.⁹

- (49) a) Üç kişi gel-di-k.
 three person come-PAST-1PL
 ‘We came in a group of three.’
 b) Üç kişi gel-di-niz.
 three person come-PAST-2PL
 ‘You came in a group of three.’

As indicated by translations in (49a-b), (49a) denotes a group of people, including the speaker, but excluding the listener, while (49b) includes the listener, but excludes the speaker.

As a possible explanation of this variation in agreement, it has been proposed that the reason why a numeral phrase can agree with a 1PL and 2PL verb is the existence of a silent subject *biz* ‘we’/ *siz* ‘you.PL’, which controls the PRO subject of the adverbial clause headed by the converb *olarak* ‘being/as’, which are not present in the surface structure, as shown in (50a) and (50b) (Göksel & Kerslake, 2004; Özyıldız, 2017).

- (50) a) Buraya ~~biz~~ [PRO_i üç kişi ~~olarak~~] gel-di-k.
 here we PRO three person be.GER come-PAST-1PL

⁹ As stated in footnote 3 in Chapter 1, I am taking the agreement to target a bundle of features; a different approach would be take each feature (number and person) to be exposed to a separate Agree process. This is something that could be done for the future research. I thank Prof. Dr. Özgür Aydın for pointing this out.

‘We were three people to come here.’

b) Buraya *siz* [PRO_i *üç* *kişi* *olarak*] *gel-di-niz*.

here you PRO three person be.GER come-PAST-2PL

‘You were three people to come here.’

If it is correct that when the verb with a quantified subject shows agreement other than 3rd person, it is because the structure of the subject contains a silent pronoun (*biz* ‘we’/*siz* ‘you.pl’) and a whole embedded clause *PRO üç kişi olarak* ‘being three persons’, the processing of such a big chunk of structure should be more complicated than the processing of the same phrase *üç kişi* ‘three person’ when it underlyingly consists only of the numeral *üç* ‘three’ modifying the noun *kişi* ‘person’. My experiment focuses on the question of whether sentences with mismatches in person (and number) agreement between the verb and the quantified subject are more difficult to process than sentences in which the person (and number) morphology on the verb matches the person feature of the surface quantified subject.

2.1.6. Numeral Pronouns in Turkish

In addition to quantifiers, numerals are also used as pronouns by replacing the noun with possessive agreement added to the end of the numeral, as shown in (51b) (Kornfilt, 1997). Although there is no limit to increasing the number in the numeral, the higher numbers are used, the rarer the structure becomes.

(51) a) *dördü-müz*

Turkish

four-1PL

‘we four’

b) *iki-niz*

two-2PL

‘you two’

Numeral pronouns carry overt person morphology and they unambiguously require the same person agreement marking on the verb, as shown in (52a-b): the verb displays

the first/second person plural agreement, which matches the suffix *–müz/–nüz* on the numeral pronoun.

- (52) a) Üçümüz park-ta yürü-dü-k/*yürü-dü. *Turkish*
three of us park-LOC walk-PAST-1PL/*3SG
'Three of us walked in the park.'
- b) Üçünüz park-ta yürü-dü-nüz/*yürü-dü.
three of you park-LOC walk-PAST-2PL/*3PL
'Three of you walked in the park.'

Given the lack of ambiguity in the structure and or feature specification of numeral pronouns, I expected the subject-verb agreement between a numeral pronoun and a verb to be processed more easily relative to the the subject-verb agreement between a numeral quantifier and a verb.

2.2. The Significance of the Study

This is the first time person (and number) agreement mismatches with quantified subjects in Turkish are examined from the processing perspective. Besides providing insights into processing of sentences containing quantified subjects, the study may inform theoretical proposals regarding the syntactic structure underlying numerally quantified phrases in Turkish.

The existing literature on quantifiers focuses on specific languages, such as Japanese or Korean, because of the unique structure of numeral quantifiers in these languages. The emphasis is on theoretical investigations (Nakanishi & Tomioka, 2004; Shin, 2009). In Turkish, previous research has examined quantifiers, especially numeral quantifiers, in terms of theoretical properties, but there has been no study focusing on the experimental perspective, especially processing perspective (Göksel & Kerslake, 2004; Kornfilt, 1997; Özyıldız 2017).

In recent decades, however, a growing body of literature has examined number and person in subject-verb agreement in various languages, through different kinds of methods: via eye-tracking in Spanish (Biondo et al., 2018), via a self-paced reading task in Italian (Mancini et al., 2014) or via electrophysiological (ERP) measures in Hindi (Nevins et al., 2007). For example, Mancini et al. (2014) examined the processing of subject-verb agreement in Italian by manipulating person and number features. They provided participants with sentences featuring a mismatch either in person or in number, which rendered the sentences ungrammatical. They concluded that greater processing difficulty occurs in the processing of person mismatches than in number mismatches. The present experiment also manipulated the person features; however, this manipulation did not cause ungrammaticality.

Previous processing literature mostly focuses on the processing of only singular and plural subjects rather than numerals. No previous studies have tested agreement with numeral subjects or numeral quantifiers. Especially in Turkish, the possibility of various agreement patterns with numerally quantified subjects creates a necessity to test what is said in theoretical and empirical research perspectives. Firstly, this study examines the processing of possible agreement patterns with numeral quantifiers as subjects of a sentence. Secondly, to check whether any possible difficulties stem from the structure of numeral quantifier phrases themselves, the processing of agreement with numeral pronoun subjects, where no mismatches are allowed, is also tested.

2.2.1. Research Questions

- 1) Are agreement mismatches with numerally quantified subjects (for example, the subject=3SG and the verb=1PL) harder to process than the absence of mismatches (subject=3SG and the verb=3SG)?
- 2) Does the processing of subjects with numeral pronouns (morphologically and semantically unambiguous) significantly differ from the processing of numerally quantified subjects (semantically ambiguous)?

2.2.2. Expectations

Based on theoretical research, I expect to find that the 3SG agreement morphology with numerally quantified subjects is easiest to process (Göksel & Kerslake, 2004; Kornfilt, 1997). I expect that it will differ significantly from other agreement types: 1PL and 2PL because these are surprising agreement types with numerally quantified subjects, which are, superficially at least, specified for 3rd person. Also, the underlying structure of a numerally quantified subject when it agrees with a verb marked for first or second person underlyingly has an adverbial *olarak* ‘being’, which is absent from the surface structure. Therefore, when the processor meets first or second person agreement in a sentence with a numerally quantified subject, it needs to go back to the beginning of the sentence to compensate for the existence of this adverbial. To explain, we expect that when participants see an unexpected agreement pattern, they use the retrieval mechanism to re-analyze the sentence from scratch in order to reach the agreement between the subject and the matrix verb. No difference is expected to emerge between the processing of 1PL and 2PL agreement morphology with numeral quantifiers because they would be found equally surprising.

I also expect a difference to emerge between numeral pronouns and numeral quantifiers with 1PL and 2PL agreement morphologies on the verb because in numeral pronouns, such agreement represents a situation in which the person features on the verb *match* those overtly present on the subject, while in numeral quantifiers, 1PL and 2PL agreement on the verb *does not match* the person feature overtly visible on the subject (3rd). Thus, in these situations numeral pronouns are expected to be easier to process.

2.3. Experiment

Experiment I tested the processing of Turkish verbal agreement patterns with numerally quantified subjects (e.g., *iki kişi* ‘two persons’). Four different agreement

types were tested: 3rd person singular (3SG), 3rd person plural (3PL), 2nd person plural (2PL) and 1st person plural (1PL). In order to control for the relative ease of processing 1st versus 2nd person plural agreement, two more conditions were added, in which verbs (with 1PL and 2PL agreement morphology) agreed with a numeral pronoun subject (e.g., *ikimiz* ‘the two of us’, *ikiniz* ‘the two of you’).

2.3.1. Participants

A total of 134 participants (97 females) took part in the experiment. They all studied in the preparatory school of a private Turkish university. All were native Turkish speakers, and studied English as a foreign language. Their English level was A1, determined at the beginning of the semester with an in-house placement test. The reason why the lowest level English speakers were selected for this study was to eliminate a possible effect of English on their agreement judgments. Their last obtained educational degree was a high school diploma, and they were all undergraduate students. Their ages were between 18 and 22 ($M=19.15$, $SD=.88$).

2.3.2. Instruments

A total of 48 experimental items were designed. The subjects in all experimental items were quantified: 36 were numeral quantifiers (e.g., *iki kişi* ‘two persons’), and 12 were numeral pronouns (e.g., *ikimiz* ‘the two of us’). Thus, an experimental item started either with a numeral quantifier (*bir* ‘one’, *iki* ‘two’, etc.) followed by the noun *kişi* ‘person’ or with a numeral pronoun (*ikimiz* ‘the two of us’, *ikiniz* ‘the two of you’). In the subjects with numeral quantifiers, the noun was always *kişi* ‘person’ and all the numerals consisted of two to four letters. The subject was followed by an adverbial of place (e.g., *bu havuzda* ‘in this pool’). All the adverbials included the demonstrative *bu* ‘this’ and the locative nouns that followed the demonstrative were controlled for length and frequency. The sentence continued with an unergative verb and ended with a time adverbial. The time adverbial was the same across all items (*daha geçen hafta* ‘just last week’). All the experimental items had the same time adverbial ending

because these regions were the critical regions in the experiment – the differences (if any) among the experimental conditions were expected to show up in these regions. The differences in reading times among various agreement types were also expected to emerge on the verb; however, the verbs differed in length due to the different agreement morphology, so any differences in reading times might stem from the length difference rather than from the agreement type. This was the reason for placing an adverbial *after* the verb rather than *before* the verb (which would be the natural order in a Turkish sentence). The natural order would place the verb (with agreement morphology) at the very end of the sentence and it is known that the final region is subject to wrap-up effects (Just & Carpenter, 1980; Rayner et al., 1989) and is therefore not reliable for drawing conclusions about the effect of the experimental manipulation.

The experimental items were grouped into six conditions, and they were as follows:

- (53) Üç kişi bu havuz-da yüz-üyor-du daha geçen hafta.
three person this pool-LOC swim-PROG-PAST-3SG just last week.
*‘Three person was swimming in this pool just last week.’

Numeral quantifier 3SG

- (54) Üç kişi bu havuz-da yüz-üyor-lar-dı daha geçen hafta.
three person this pool-LOC swim-PROG-3PL-PAST just last week.
*‘Three person were swimming in this pool just last week.’

Numeral quantifiers 3PL

- (55) Üç kişi bu havuz-da yüz-üyor-du-nuz daha geçen hafta.
three person this pool-LOC swim-PROG-PAST-2PL just last week.
*‘Three person (you) were swimming in this pool just last week.’

Numeral quantifiers 2PL

- (56) Üç kişi bu havuz-da yüz-üyor-du-k daha geçen hafta.
three person this pool-LOC swim-PROG-PAST-1PL just last week.
*‘Three person (we) were swimming in this pool just last week.’

Numeral quantifiers 1PL

- (57) Üçünüz bu havuz-da yüz-üyor-du-nuz daha geçen hafta.

three of you this pool-LOC swim-PROG-PAST-2PL just last week.

‘The three of you were swimming in this pool just last week.’

Numeral pronouns 2PL

(58) Üçümüz bu havuz-da yüz-üyor-du-k daha geçen hafta.

three of us this pool-LOC swim-PROG-PAST-1PL just last week.

‘The three of us were swimming in this pool just last week.’

Numeral pronouns 1PL

The experimental items were written with eight unergative verbs (*yüzmek* ‘to swim’, *konuşmak* ‘to talk’, *koşmak* ‘to run’, *yürümek* ‘to walk’, *oynamak* ‘to play’, *çalışmak* ‘to work’, *ağlamak* ‘to cry’, *uyumak* ‘to sleep’).

The experimental items were mixed with 16 filler items and pseudorandomized so that two experimental items did not appear consecutively. All of the filler items were grammatical sentences with a correct agreement type on the verb. The filler items consisted of the same number of words and had the same grammatical structure as the experimental items. The purpose of having filler items of the same length was to prevent any effect of the difference in the sentence length on processing. Similar to the experimental items, the filler items started with a subject consisting of two parts, which were an adjective and a noun. The subject was followed by an adverbial of place. The sentence continued with the verb and ended with a time adverbial, which included three elements, as shown in (59) and (60).

(59) Evli kadın güzel çiçek-ler yetiştir-iyor-du çok zaman önce.

married woman beautiful flower-PL grow-PROG-PAST-3SG long time ago.

‘The married woman was growing beautiful flowers a long time ago.’

(60) Genç kız küçük kedi-ye bak-ıyor-du birkaç gün önce.

young girl little cat-DAT take care of-PROG-PAST-3SG a few day ago.

‘The young girl was taking care of the little cat a few days ago.’

In a sentence processing study, the consistency in experimental items is one of the significant factors to be considered. To provide consistency across items, elements of

a sentence should be similar in terms of frequency, type, and length (i.e., number of characters or syllables) (Keating & Jegerski, 2015). In a processing study on agreement mismatches, the verb type and the verb frequency are essential factors because they could affect the participants' reading times. To minimize the effect of verb type on processing, all of the verbs used in the experiment were unergative verbs. Next, to eliminate any differences which could be caused by the difference in the frequency of the verb, the frequency of the verbs used in the experiment was controlled for. This was done via a survey conducted on Google Forms (see Appendix B). 117 native speakers of Turkish were asked to rate how often they saw various verbs in their real-life. The list of verbs included the verbs used in the experimental items, but also other verbs, with varying frequencies. Participants were asked to indicate how often they encounter the verbs given. They were required to mark their answers on a rating scale from 1 (least frequently seen) to 5 (most frequently seen) All of the experimental verbs were in the first 30% of all verbs and the participants showed a high tendency to say that they frequently see and use these verbs in their daily life.

Every item consisted of seven regions, as shown in Table 2 and Table 3. As the number of the regions in the sentences with the numeral pronouns, shown in Table 3, was seven, a numeral quantifier and the noun in sentences with numerally quantified subjects, shown in Table 2 were collapsed into one region.

Table 2. *Regions of the Items with Numerally Quantified Subjects*

R1	R2	R3	R4	R5	R6	R7
Üç kişi	bu	havuz-da	yüz-üyor-du	daha	geçen	hafta
Three person	this	pool- LOC	swim-PROG-PAST-3SG	just	last	week
'Three persons were swimming in this pool just last week.'						

Table 3. *Regions of the Items with Numeral Pronouns*

R1	R2	R3	R4	R5	R6	R7
Üçümüz	bu	havuz-da	yüz-üyor-du-k	daha	geçen	hafta
Three of us	this	pool- LOC	swim-PROG-PAST-1PL	just	last	week
'Three persons were swimming in this pool just last week.'						

Every item was followed by a comprehension question. Comprehension questions were prepared to ensure that the participants read the sentences carefully enough to get the primary meaning of the target sentences. The comprehension questions consisted of two groups, one of which was yes-no type questions, as shown in (61), and the other was wh-questions, shown in (62). Twelve items appeared with yes-no comprehension questions, and 12 items appeared with wh-comprehension questions in a list. Care was taken that answers to comprehension questions do not interact with the participants' interpretation of the quantified subject, which was reflected on the verbal agreement.

- (61) İki kişi bu sokak-ta yürüy-or-du daha geçen hafta.
 two person this street-LOC walk-PROG-PAST-3SG just last week.
 'Two persons were walking this street last week.'
 Yürüy-en iki kişi miydi? YES-NO QUESTION
 Walk-SRC two person Q.PAST?
 'Was it two people walking?'
- (62) Dört kişi bu ofis-te çalış-ıyor-lar-dı daha geçen hafta.
 four person this office-LOC work-PROG-PAST-3PL just last week.
 'Four persons were working in this office just last week.'
 Ofis-te çalış-an kaç kişiydi? 1) Dört 2)Üç
 Office-LOC work-SRC how many person.PAST? 1) Four 2)Three
 'How many persons were working in the office?' 1) Four 2)Three
 WH- QUESTION

Finally, the experimental items were distributed across six presentation lists using a Latin square design. Each list consisted of 8 experimental items and 16 fillers. Every participant saw every type of verb and every condition.

At the beginning of each list, there was a set of demographic questions asking the participants to provide their gender, age, native language and their most recently obtained educational degree (see Appendix C).

2.3.3. Procedure

A self-paced reading task (SPRT) is an on-line computer-assisted technique introduced by Just and Carpenter (1982), which enables the researchers to reach participants' reaction time to a specific word or a phrase consisting of two or more words. In an SPR task, a participant sees a word or a phrase on the screen and after reading these units, they push a button to see the next one. SPR records how much time a participant spends to look at each word. This experiment employed a non-cumulative moving-window technique, in which a text is first represented with dashes on the screen, with each dash masking a word in the sentence. When the participant presses the button the first time, the first word appears, which replaces the dashes corresponding to that word. With each subsequent key press, the previous word is remasked, and the new word appears on the screen.

SPRT was selected for this study to see whether any difference will occur in the processing of the sentences with different agreement types in real-time. The predictability of a structure determines its comprehension and the reaction time (MacDonald et al., 1994; McRae et al., 1998): When the structure is more predictable, the participants tend to read the sentences faster than unpredictable and infrequent ones (Levy, 2013). The readers' reaction time to different agreement types will be a reflection of whether the structures match their expectations or not. So, the agreement types with longer reaction times will show the readers were not expecting to see this particular agreement morphology on the verb, which made them take longer to process this specific case.

The data were collected via Ibex Farm Program, which is an on-line platform used for on-line tasks such as self-paced reading, acceptability judgment or the tasks with flashed sentences (Drummond, 2016). The reason for using Ibex farm to collect data was that it enabled the participants to reach the experiment via a link without having to download any application, and it allowed the participants to complete the experiment simultaneously. In the task, all of the sentences and questions were placed

in black letters on a papaya-whip background in a pre-set 24-point font. Data were collected in a computer lab. The participants took the experiment in a computer lab, in groups of 15 at a time, under the supervision of the researcher and all the participants completed the task on the same kind of computer (Dell Vostro 3670 Intel Core i5). After the participants entered the computer lab, they logged into the computers with their school ID and passwords. The link of the experiment was uploaded to a platform that students use very often for their classes. They copied the link to their Google Chrome browser. After all the participants were ready, they were instructed about the experiment and what was expected of them. They were told to wait for their peers to complete the experiment silently, not to distract them if they finish their experiments earlier than others. Before they came to the lab, their class instructors also informed the students about the program itself and how it worked. Thus, they got acquainted with the program. On the first page of the experiment, every participant approved that their participation in this study is voluntary-based (Appendix D). The experiment started with five practice items each followed by a comprehension question. Every word in the sentence was replaced by a dash which was the almost as same length as the word itself. After each word, participants pressed the space bar, and the duration between each two presses was recorded by the program. After they completed the experiment, they waited for their peers who had not completed it yet. When all the students completed the experiment, they were informed about the aim of the experiment. This procedure was repeated for ten different groups.

2.3.4. Data Analysis

The number of correct answers for the comprehension questions was checked, and the participants who answered less than 70% of the questions correctly were excluded from the study. It caused the exclusion of one participant from the analysis.¹⁰

¹⁰Both filler and experimental items were used for the calculation of accuracy of comprehension questions because the nature of the experimental condition did not interfere with the understanding of the question and the ability to answer it. All of the experimental items were grammatical sentences and the participants could answer the comprehension questions regardless of how they processed the subject or the verb. Their speed of reading an experimental sentence did not affect the correctness of their answers as there was no specific agreement type used in the questions.

The data trimming process was carried out in two steps. The first step was to remove extreme values as certain reading times under or above a specific value do not reflect the participants' real reading times. The reaction times (RTs) which were lower than 100 ms were accepted as extreme values since 100 ms is not sufficient time to read and process a word (Linzen & Jaeger, 2016; Jegerski, 2014). RTs higher than 3000 ms were accepted as the high cut-off point because those may indicate the effect of external factors for native speakers (Havik et al., 2009; Stowe & Kaan, 2006). Therefore, the reaction times lower than 100 ms (per region) and higher than 3000 ms were removed, which caused the loss of 0.32% of all data. These values were replaced by the mean scores of all the participants of the removed region in this condition.

As a second step, a more detailed cleaning, namely the elimination of outliers, was needed to increase the effectiveness of parametric tests. The outliers were detected via absolute deviations around the median (MADs), which is a robust measure of showing how the data is distributed. MADs were calculated on R (Leys et al., 2013; R Core Team, 2015). RTs were excluded if they deviated by more than the default threshold 2.5 MADs, which corresponds to 3 Standard Deviation (SD) if data were normally distributed. The reason why MADs were preferred instead of the calculation of SD was that outliers affect the mean in an SD calculation more than they do median in a MADs calculation, and MADs are more effective than SD in non-normal distribution (Leys et al., 2013). Outliers that were above the upper threshold were 7.6% of the total 6,432 RTs. After the outliers were determined and removed, the missing values were replaced by the mean RT of all participants in the condition in that region (Lachaud & Renaud, 2011).

The descriptive statistics analysis was performed on the data. It consisted of two parts: the analysis of quantified subject and the analysis of numeral pronouns. The analysis for the two was done separately because we were interested to see how the participants computed the meaning and what kind of interpretation they assigned the quantified subjects like *üç kişi* 'three person'. They could have interpreted these subjects as either including the speaker and/or the hearer or as excluding them. In the former case, the expected agreement morphology on the verb would be 1PL or 2PL, indicating that

participants assigned a more complex structure to the subject than the surface string suggests (possibly the structure proposed by Özyıldız (2017): (*biz/siz*) *iki kişi (olarak)* ‘us/you, being two people’).¹¹ In the latter case, the expected agreement morphology on the verb would be 3SG or 3PL, suggesting that the subject is assigned a simpler analysis, which closely reflects the surface string. In numeral pronouns (e.g., *ikimiz* ‘the two of us’), the ending on the pronoun clearly indicates that the pronoun is *inclusive* either of the speaker (in which case, 1PL agreement is required) or of the hearer (in which case the 2PL agreement is required). Because of the lack of ambiguity in the processing of numeral pronoun subjects, it was expected that first and second plural agreement in items with numeral pronoun subjects would be easier to process than first and second plural agreement in items with numerally quantified subjects. Because of this expected difference in the ease of processing of the two kinds of subjects, the descriptive analysis was performed separately for these two kinds of data. When it comes to comparisons, two different analyses were performed; in each the dependent variable (DV) was participants’ reaction times while the independent variables (IV) were agreement type and regions. The first analysis was performed only on the items with numerally quantified subjects, and the second one compared the reading times of items with numerally quantified subjects with the reading times of items with numeral pronoun subjects when each agreed with verbs carrying 1PL or 2PL agreement morphology.

In the first analysis, performed only on items with numerally quantified subjects, the agreement type variable had four levels (3SG, 3PL, 2PL and 1PL) and the region variable had two levels (Region 5 and Region 6). The purpose of this analysis was to see what is the most preferred interpretation of the numerally quantified subjects (e.g., *iki kişi* ‘two persons’), as revealed by the speed with which participants read sentences with different agreement morphology on the verbs. F₁ analysis (i.e., by participant) consisted of two within subject variables: agreement (3SG, 3PL, 2PL and 1PL) and regions (Region 5 and Region 6). F₂ analysis (i.e., by item) had one between subject variable: agreement type (3SG, 3PL, 2PL and 1PL) and one within subject variable: regions (Region 5 and Region 6). The final data set was analyzed using the Statistical

¹¹ See section 2.1.5 above.

Package for the Social Sciences (SPSS version 26.0) software. 3x4 two way Repeated Measures ANOVA was computed on non-critical regions of the experimental items to see whether experimental manipulations had any effect on the participants' reading times in non-critical regions. Lastly, two different 4x2 two-way repeated measures ANOVA were conducted on the critical regions. The Repeated-Measures ANOVA Analysis was used with Greenhouse-Geisser Adjustment. Based on the results of Repeated Measures ANOVA, paired-samples t-tests were performed.

The second analysis was performed to compare the processing of sentences with numeral quantifiers and those with numeral pronouns. In this analysis, there was one dependent variable: reaction times, while there were two independent variables: agreement with four levels (2PL and 1PL with numeral pronouns, 2PL and 1PL with numeral quantifiers) and regions with two levels (Region 5 and Region 6). The reason why only 1PL and 2PL agreement types were taken into the analysis is that participants had to posit a more complex structure for numerally quantified subjects only when these subject agreed with verbs marked with 1PL and 2PL morphology. The interpretation of numerally quantified subjects agreeing with 3SG/PL verb did not require positing a structure for the subject phrase different from the surface string, so in that respect these subjects did not differ from numeral pronouns. For this reason, we only tested those numeral pronouns in Turkish that require 1PL or 2PL agreement morphology on the verb (e.g., *ikimiz* 'the two of us', *ikiniz* 'the two of you') and compared them with the processing of numerally quantified subjects in the same condition.

2.3.5. Results

Recall from Table 1 and Table 2 in the previous section that my experimental items were divided into seven regions. The distribution of regions is repeated in Table 4 and 5 below. Recall also that the verb itself was not considered to be a critical region because the differences in length due to the different agreement morphology may have interfered with reading time differences caused by the agreement type. That is why post-verbal regions: Region 5 and Region 6 were taken as the critical regions.

Table 4. *Regions of the Items with Numerally Quantified Subjects*

R1	R2	R3	R4	R5	R6	R7
Üç kişi	bu	havuz-da	yüz-üyor-du	daha	geçen	hafta
Three person	this	pool- LOC	swim-PROG-PAST-3SG	just	last	week
'Three persons were swimming in this pool just last week.'						

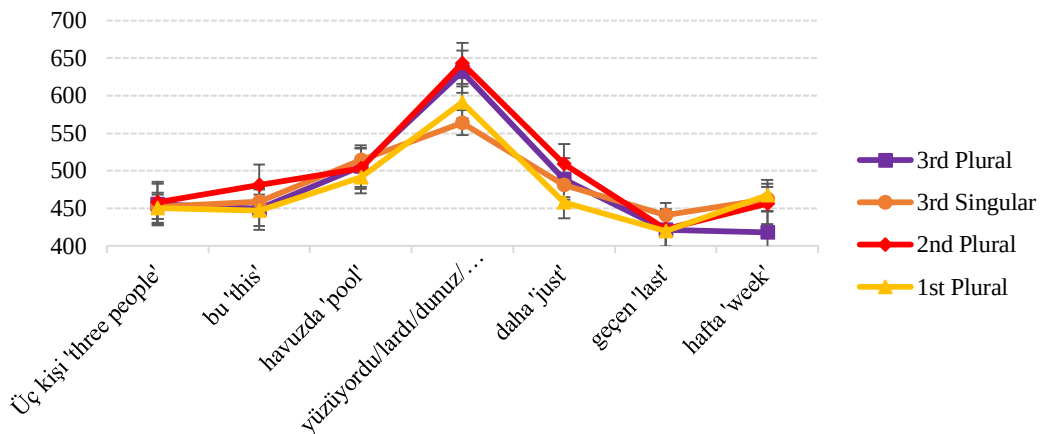
Table 5. *Regions of the Items with Numeral Pronouns*

R1	R2	R3	R4	R5	R6	R7
Üçümüz	bu	havuz-da	yüz-üyor-du-k	daha	geçen	hafta
Three of us	this	pool- LOC	swim-PROG-PAST-1PL	just	last	week
'Three persons were swimming in this pool just last week.'						

2.3.5.1. Numeral Quantifiers

a. Descriptive Analysis

Mean reading times (RTs) for each region in each condition were calculated. Figure 1 shows the mean raw RTs by region in sentences with numerally quantified subjects agreeing with verbs carrying different agreement morphology (3SG, 3PL, 2PL, and 1PL).

**Figure 1.** *Mean Raw Reading Times in Numeral Quantifier items*

To show the participants' preference for agreement type in the critical regions, the participants' mean RTs for Regions 5 and 6 for numerally quantified subjects were calculated and shown in Figure 2 and Figure 3 respectively. As can be seen, 1PL was the most preferred agreement type in the sentences with quantified subjects (both numerally quantified subjects and numeral pronouns) as it was processed the fastest in both regions.

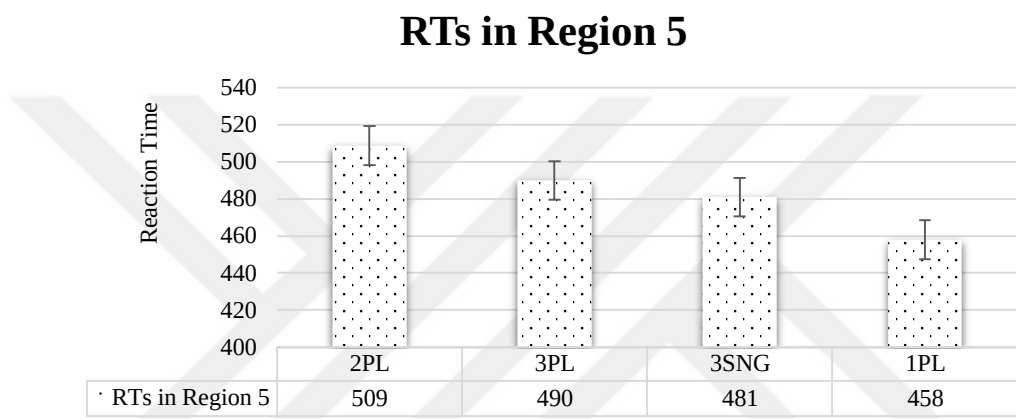


Figure 2. Mean Raw Reading Times of Region 5 in All Conditions agreeing with Numerally Quantified Subjects

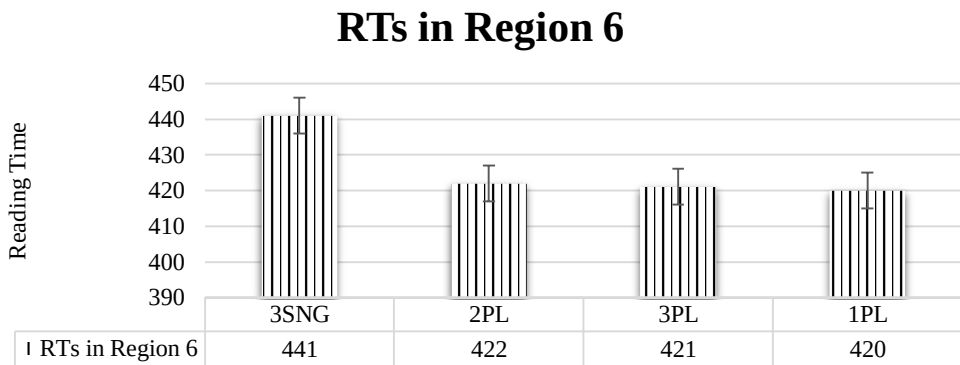


Figure 3. Mean Raw Reading Times of Region 6 in All Conditions agreeing with Numerally Quantified Subjects

b. Comparisons

To ensure that agreement factor had no effect on reading times of non-critical regions, 3x4 two-way Repeated Measures ANOVA was conducted on the first three regions of experimental items and no significant effect of agreement was observed [F_1 (2.95, 391.84)=1.54, $p=.205$, F_2 (3, 20)=.50, $p=.69$].

Region 4, which contained the verb, was analyzed for completeness, and showed a significant difference among the conditions ($p<0.001$). However, because the length of the verb might have confounded the results, I will not base my conclusions on RTs of this region.¹²

4x2 two way Repeated-Measures ANOVA was conducted with agreement types with numeral quantifiers (3SG, 3PL, 2PL, and 1PL) and two critical regions (Region 5 - *daha* ‘just’- and Region 6 - *geçen* ‘last’) by participant and by item. The Repeated-Measures ANOVA Analysis, used with Greenhouse-Geisser Adjustment, showed that there was a significant main effect of the agreement type [F_1 (2.905, 383.495) = 3.97, $p=.008$], the region [F_1 (1, 132) = 129.32, $p<.001$, F_2 (1, 20) = 112.20, $p<.001$], as well as a two-way interaction between agreement type and region [F_1 (2.835, 374.175) = 7.62, $p<.001$, F_2 (3,20) = 4.5, $p=.054$]. On the other hand, no significant main effect of agreement was observed in the by item analysis (F_2 (3, 20) = 0.71, $p=.584$).

As a significant effect of the agreement type factor was observed in the by participant analysis, post hoc comparisons using the Bonferroni correction were conducted. It showed a significant difference between 3SG and 1PL agreement type ($p<0.05$): 3SG verbs were slower to process than 1PL verbs. Also, it revealed that participants were significantly slower in 2PL condition than in 1PL condition ($p<0.05$).

¹² That the length of the verb may have played a role in the speed of agreement is suggested by the fact that 1pl and 3sg verbs, which differ only in one letter and contain the same number of syllables (e.g., *yüzüyordu* ‘swim.past.prog.3sg’; *yüzüyorduk* ‘swim.past.prog.3sg’) were not significantly different from each other, and they were significantly different from 3pl and 2pl, which contain an extra syllable (e.g., *yüzüyordular* ‘swim.past.prog.3pl’; *yüzüyordunuz* ‘swim.past.prog.2sg’).

Another significant effect was observed in Region Factor. The following post hoc comparison using the Bonferroni correction showed that there was a significant difference between Region 5 and Region 6 ($p < 0.001$). It demonstrated that Region 5 was read slower than Region 6.

Paired Samples T-Tests

In order to see the existence of any significant differences between agreement types by region showed above, following Repeated Measures ANOVA, a paired-samples T-test was performed on Region 5 and Region 6 in items with numeral quantifiers by participant as illustrated in Table 6.

Table 6. *Paired Samples T-tests Comparing Agreement Types per Region (Statistically significant pairs)*

<i>Paired Samples T-tests</i>		<i>t</i>	<i>df</i>	<i>p value</i>
Region 5_2PL	Region 5_3SG	2.4	132	$p=.016$
Region 5_3SG	Region 5_1PL	2.2	132	$p=.024$
Region 5_3PL	Region 5_1PL	2.9	132	$p=.005$
Region 5_2PL	Region 5_1PL	4.8	132	$p<.001$
Region 6_3SG	Region 6_3PL	2.03	132	$p=.045$
Region 6_3SG	Region 6_1PL	2.03	132	$p=.045$

As shown in Table 6, in Region 5, following significant differences were found: a significant difference between 3SG ($M= 480.8$, $SD=113.9$) and 2PL verbs ($M=508.7$, $SD=113.4$) ($t(132) = 2.4$, $p=.016$), a significant difference ($t(132)=2.2$, $p=.024$) between 3SG ($M=480.67$, $SD=113.9$) and 1PL verbs ($M=458.12$, $SD=92.7$), and a significant difference between 3PL ($M=480.67$, $SD=113.9$) and 1PL ($M=458.12$, $SD=92.7$) ($t(132)=2.9$, $p=.005$). Lastly, as shown in Bonferroni Comparisons above, there was a significant difference between 2PL ($M=508.7$, $SD=113.4$) and 1PL

($M=458.12$, $SD=92.7$) ($t(132)=4.8$, $p<.001$): 2PL was read slower than 1PL. 1PL was read faster than all other agreement types.

In Region 6, the significant differences from paired samples t-test were as follows: 3SG ($M=441.5$, $SD=128.6$) and 3PL ($M=421$, $SD=108.2$) ($t(132) = 2.03$, $p=.045$): 3SG was read slower than 3PL and a significant difference between 3SG ($M= 441.5$, $SD=128.6$) and 1PL ($M=420$, $SD=97.1$) ($t(132) = 2.03$, $p=.045$): 3SG was read slower than 1PL.

Region 7 was not taken into consideration because of possible wrap-up effects.

2.3.5.2. Numeral Pronouns

a. Descriptive Analysis

Figure 4 indicates the mean raw RTs of 2PL and 1PL agreement morphology with numeral pronoun subjects (NP).

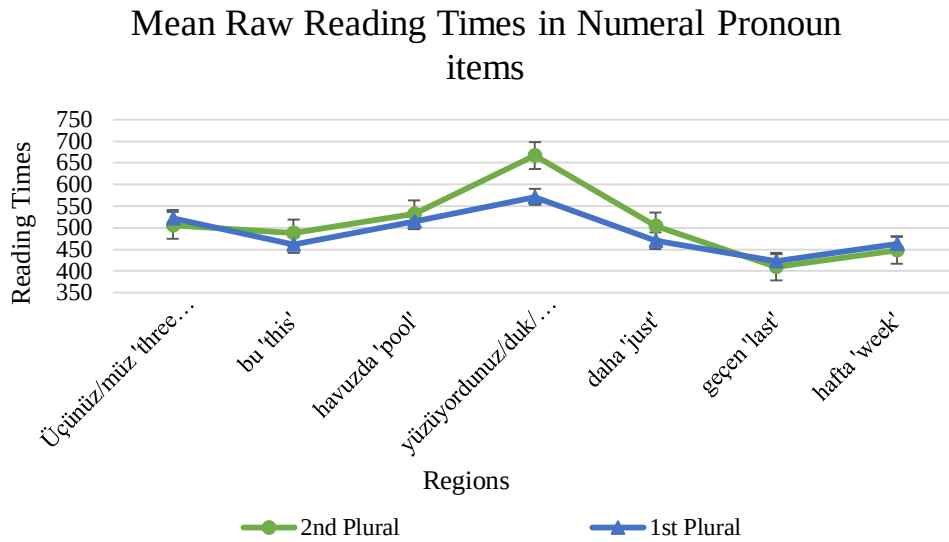


Figure 4. Mean Raw Reading Times of All Regions in 2PL and 1PL agreeing NP

b. Comparison of Numeral Quantifiers and Numeral Pronouns

To compare how participants processed verbal agreement when the verb agreed with numeral quantifiers as opposed to numeral pronouns, mean RTs for Regions 5 and 6 for 2PL and 1PL agreement morphology were calculated for sentences with numerally quantified subjects (NQ) and sentences with numeral pronoun subjects (NP). The results are shown in Figure 5 and Figure 6.

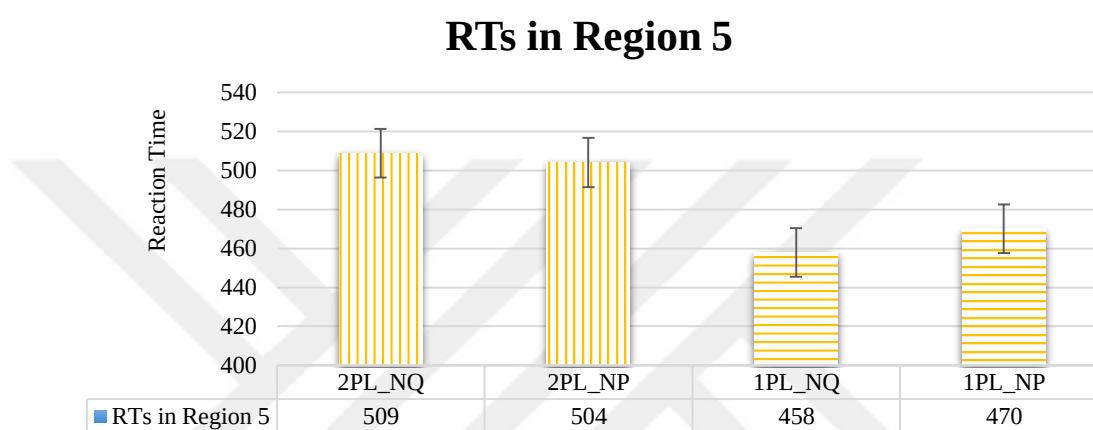


Figure 5. Mean Raw Reading Times of Region 5 in 2PL and 1PL agreeing with NQ and NP

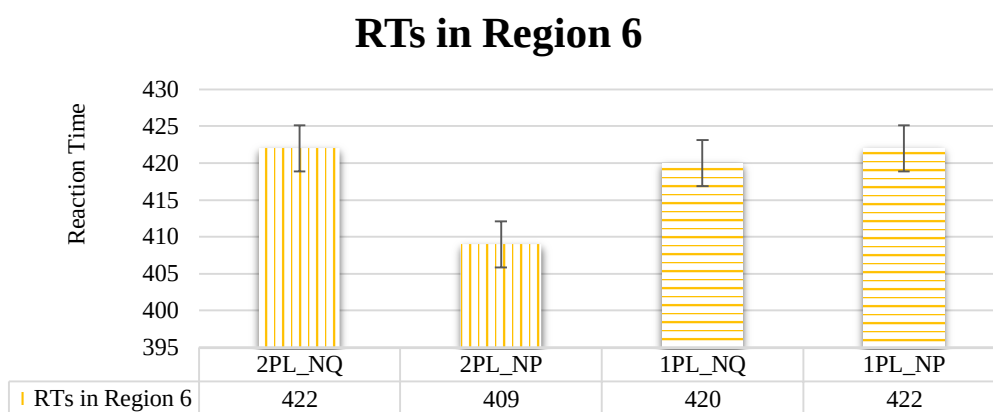


Figure 6. Mean Raw Reading Times of Region 6 in 2PL and 1PL agreeing NP and NQ

To ensure that experimental manipulations of agreement had no effect on non-critical regions, two-way Repeated Measures ANOVA was conducted on the regions 2 and 3 in experimental items with quantified subjects and numeral pronouns. The reason why Region 1 is not taken into consideration is because in the subjects with numeral pronouns there was one word while in the items with numeral quantifiers there were two words, so they were not comparable to one another.

Region 2 and Region 3 were analyzed together and no main effect of agreement occurred in 2PL agreement morphology with numeral pronouns and numerally quantified subjects [$F_1(1, 132) = 3.223, p=.075, F_2(1, 10) = .522, p=.486$], but a significant main effect of region was indicated [$F_1(1, 132) = 14.680, p<.001, F_2(1, 10) = 6.138, p=.033$], No interaction between agreement and region was shown [$F_1(1, 132) = 2.07, p=.153, F_2(1, 10) = 1.021, p=.336$]. The same analysis was conducted for 1PL agreement morphology with numeral pronouns and numerally quantified subjects. It also indicated no main effect of agreement [$F_1(1, 132) = 3.505, p=.063, F_2(1, 10) = .106, p=.751$] and a significant main effect of region factor [$F_1(1, 132) = 34.908, p<.001, F_2(1, 10) = .744, p=.021$]. There was no interaction between region and agreement [$F_1(1, 132) = .375, p=.541, F_2(1, 10) = .129, p=.727$].

Three different 3x2 two way Repeated Measures ANOVA were conducted on agreement types with numeral pronouns (2PL and 1PL agreement morphology) and numeral quantifiers (2PL and 1PL agreement morphology) and regions (Region 4 - *yüziyorduk* 'were swimming', Region 5 - *daha* 'just' - and Region 6 - *geçen* 'last') to see whether there was any difference in processing 1st and 2nd person plural agreement with numeral quantifiers compared to 1st and 2nd person plural agreement with numeral pronoun subjects by participants and by item.

The first analysis was to compare the processing of 2PL agreement morphology with numeral pronouns and numerally quantified subjects. This analysis showed no significant main effect of agreement [$F_1(1, 132) = .186, p=.667, F_2(1, 10) = .433, p=.525$], but a significant main effect of region factor was found [$F_1(1, 132) = 172.55,$

$p < 0.001$, $F_2(2, 20) = 44.719$, $p < 0.001$] and no interaction between regions and agreement was found [$F_1(1, 132) = 1.920$, $p = .149$, $F_2(2, 20) = .343$, $p = .617$]. A post hoc comparison using the Bonferroni correction indicated that Region 6 was significantly easier to process than Region 5 ($p < 0.001$). Region 5 was processed easier than Region 4 ($p < 0.001$).

The second analysis was to compare the processing of 1PL agreement morphology with numeral pronouns and numerally quantified subjects. This analysis also showed no significant main effect of agreement [$F_1(1, 132) = .152$, $p = .698$, $F_2(1, 10) = .132$, $p = .724$], but a significant main effect of region factor was found [$F_1(1, 132) = 129.353$, $p < 0.001$, $F_2(2, 20) = 49.60$, $p < 0.001$] and no interaction between regions and agreement was found [$F_1(1, 132) = 2.131$, $p = .131$, $F_2(2, 20) = 1.1$, $p = .339$]. The same pattern with the previous analysis appeared. In other words, Region 5 was easier to process than Region 4, which was the main verb ($p < 0.001$). Region 6 was processed easier than Region 5 ($p < 0.001$).

To summarize, no significant difference between numeral quantifiers and numeral pronouns of the same agreement type was found, indicating that neither type of subjects affects the processing of verbal agreement differently from the other.

Given that the analysis of items with numerally quantified subjects in section 2.3.5.2 showed that in region 5 and 6, 1PL agreement was processed more easily than any other agreement type, I wanted to check whether the same finding would arise in items with numeral pronouns, where the subject carries an overt indication of person (*ikiniz* ‘two of you’, *ikimiz* ‘two of us’). This is why the final analysis compared the processing of 1PL and 2PL agreement morphology with numeral pronouns in critical regions (Region 5 and Region 6). The results indicated no significant main effect of agreement [$F_1(1, 132) = 1.2$, $p = .270$, $F_2(1, 10) = .105$, $p = .753$], but a significant main effect of region factor was found [$F_1(1, 132) = 95.6$, $p < 0.001$, $F_2(1, 10) = 27$, $p < 0.001$] and an interaction between regions and agreement was found [$F_1(1, 132) = 9.56$, $p = .002$, $F_2(1, 10) = 1.314$, $p = .278$]. This may mean that 1PL with numeral pronouns was not processed easier than 2PL. As this was the case with the numeral quantifiers, it indicates

that 1PL in these items is easier to process than all the other agreement types because *iki kiři* ‘two people’ is most readily analyzed as ‘two people including me’, not as ‘two people including you, but excluding me’.

2.3.6. Discussion and Conclusion

In this chapter, I discuss the findings of the experiment building on the results and on what prior research suggests. Then, I move on to the conclusion and propose some suggestions for future research. Finally, I mention the limitations of the study.

2.3.6.1. Discussion

The primary aim of this experiment was to discover whether agreement mismatches with numerally quantified subjects (for example, the subject=3rd person singular and the verb=1st person plural) are harder to process than the absence of mismatches (subject=3rd person singular and the verb=3rd person singular). The second aim was to compare the processing of 1PL and 2PL verbal agreement pattern between numerally quantified subjects and numeral pronouns and to determine whether the processing of subjects with numeral pronouns (morphologically and semantically unambiguous) significantly differs from the processing of the numerally quantified subjects (semantically ambiguous). I expected the processing of numeral pronouns to be faster because of the absence of ambiguity.

According to the literature, the most preferred agreement pattern on the verb in Turkish sentences with 3PL subject is 3SG or optionally 3PL (Göksel & Kerslake, 2004; Kornfilt, 1997). Based on this, the most preferred agreement pattern with a numerally quantified subject, *üç kiři* ‘three persons’, should be 3SG (e.g., *gitti* ‘went’). However, this is not the case; instead, participants showed a preference for the *mismatch* in subject-verb agreement.

My findings indicate that 1PL is the most preferred agreement morphology with numerally quantified subjects, which suggests that 1PL in this particular configuration

is easier to process than other agreement patterns. The following sentence represents 1PL agreement with a numerally quantified subject.

- (63) Üç kişi bu havuz-da yüz-üyor-du-k daha geçen hafta.
three person this pool-LOC swim-PROG-PAST-1PL just last week.
'Three persons (we) were swimming in this pool just last week.'

Recall from the discussion surrounding example (50), repeated here as (64), that on some accounts (Göksel & Kerslake, 2004; Özyıldız, 2017) an underlying structure of the subject in (63) would be as in (64)-(65).

- (64) Burada ~~biz~~ [PRO_i üç kişi ~~olarak~~] otur-uyor-uz. Turkish
here we PRO three person be.GER live-PRES.PROG-1PL
We're three people to live here. (Özyıldız, 2017, p. 867)

Assuming that this is the underlying representation of numerally quantified subjects with 1PL agreement on the verb, then my experimental items look as in (65).

- (65) ~~Biz~~ [PRO_i üç kişi ~~olarak~~] bu havuz-da yüz-üyor-du-k daha
we three person this pool-LOC swim-PROG-PAST-1PL just
geçen hafta
last week.
'We were three people to swim in this pool just last week.'

If this is the case, then the sentence with 2PL agreement on the verb, given in (66a), would be represented as in (66b), and should be equally acceptable as (65).

- (66) a) Üç kişi bu havuz-da yüz-üyor-du-nuz daha geçen hafta.
three person this pool-LOC swim.2PL.PROG.PAST just last week.
'You as a group of three people were swimming in this pool just last week.'
- b) ~~Siz~~ [PRO_i üç kişi ~~olarak~~] bu havuz-da yüz-üyor-du-nuz daha geçen

you three person this pool-LOC swim-PROG-PAST-2PL just last
hafta.
week.

‘You were three people to swim in this pool just last week.’

However, my experiment showed that with numerally quantified subjects, there is a significant difference between 1PL verbal agreement morphology in (63) and 2PL verbal agreement morphology in (66a) and 1PL was easier to process than 2PL. This difference may originate from the processing of 1PL and 2PL agreement morphology regardless of the nature of the subject. As shown by data from many languages, there is a person hierarchy, according to which the first person is in the highest, followed by the second person and lastly, the third person (1st person > 2nd person > 3rd person) (Alexiadou & Anagnostopoulou, 2002; Feldman, 2001; Kuno & Li, 1976; Silverstein, 1976). This means that persons including the speaker or the hearer are privileged compared to the 3rd person, which does not include either of the interlocutors. Moreover, the inclusion of the speaker (1st person) overrides in some relevant sense the inclusion of the speaker (2nd person). If this is the case for Turkish as well, the reason for the difference in the ease of processing of 1PL versus 2PL may originate from this person hierarchy. However, 1PL and 2PL agreement patterns were compared in items with numeral pronoun subjects, which are overtly marked for person, as shown in (67a) and (67b), and no significant difference was detected between the two.

(67) a) Üçü-nüz bu havuz-da yüz-üyor-du-nuz daha geçen hafta.

three of you this pool-LOC swim-PROG-PAST-2PL just last week.

‘The three of you were swimming in this pool just last week.’

b) Üçümüz bu havuz-da yüz-üyor-du-k daha geçen hafta.

three of us this pool-LOC swim-PROG-PAST-1PL just last week.

‘The three of us were swimming in this pool just last week.’

The absence of difference between the processing of the two structures in (67a) and (67b) supports the claim that the difference between 1PL and 2PL with numerally quantified subjects comes from the nature of numerally quantified subjects, not from

the person hierarchy. In other words, the effect that we observed, the preference for 1PL agreement morphology, comes from the fact that the quantified phrase *üç kişi* ‘three persons’ is easier to conceive of as including the speaker, rather than anything else. The participants prefer including themselves, 1st person, *I*, in the denotation of the subject.

If there is a correlation between the complexity of syntactic structure and ease of processing, in other words, if syntactically simple structures are easier to process than syntactically complex structures (Ferreira et al., 1996; Kemper, 1987; Kemper & Rash, 1988; Scontras et al., 2015), then it is not likely that the underlying structure of the subject of the sentence in (66), repeated here as (68a), is that in (68b).

- (68) a) *Üç kişi bu havuz-da yüz-üyor-du-nuz daha geçen hafta.*
 three person this pool-LOC swim.2PL.PROG.PAST just last week.
 *‘Three person (you) were swimming in this pool just last week.’
- b) *Siz [PRO_i üç kişi olarak] bu havuz-da yüz-üyor-du-nuz daha geçen hafta.*
 you three person this pool-LOC swim-PROG-PAST-2PL just last week.
 ‘You were three people to swim in this pool just last week.’

The syntactic structure in (65)/(68b) syntactically makes a lot of sense: It predicts that the subject of the sentence *biz* ‘we’ can be omitted because Turkish is a pro-drop language, in which a person marker used on the verb shows the features of the subject even if they are not overt. Thus, it is possible that the small *pro* is the controller of PRO, instead of an overt pronoun *biz* ‘we’. To illustrate, in a sentence as in (69), PRO is controlled by a silent *pro*. Such an analysis would explain why we find the plural agreement in a numerally quantified sentence without any overt subject.

- (69) *Sen-i gör-mek isti-yor-um.*
 You-ACC see-INF want-PROG-1SG
 ‘I want to see you.’

However, processing-wise, the analysis in (65)/(68b), still does not explain why 1PL agreement is easier to process than 3SG. According to our experimental results, sentences with numeral quantifiers, such as *üç kişi* ‘three persons’ are not more difficult to process when there is an agreement mismatch between the subject and the verb, as in (71), than when there is match, as in (70).

(70) Üç kişi bu havuz-da yüz-üyor-du daha geçen hafta.
 three person this pool-LOC swim-PROG.PAST-3SG just last week.
 ‘Three persons were swimming in this pool just last week.’

(71) Üç kişi bu havuz-da yüz-üyor-du-k daha geçen hafta.
 three person this pool-LOC swim-PROG.PAST-1PL just last week.
 ‘We, being three people, were swimming in this pool just last week.’

Besides, the findings also suggest that the processing of the agreement with 3SG is not easier than the processing of other agreement options, which is surprising because 3SG is the most expected agreement type with the numerally quantified subjects, but real time processing showed the opposite. As this is the case, I propose that the possible explanation for the absence of contrast between mismatch and match in the processing of agreement pattern may be that 3SG and other options are all equally complex because the underlying structure is the same across all agreement types as shown in (72a) and (72b).

(72) a) Üç kişi bu havuz-da yüz-üyor-du daha geçen hafta.
 three person this pool-LOC swim-PROG.PAST-3SNG just last week.
 ‘Three persons were swimming in this pool just last week.’
 b) Onlar [PRO_i üç kişi ~~olarak~~] bu havuz-da yüz-üyor-du-(lardı) daha
 you three person this pool-LOC swim-PROG-PAST-3SG (3PL) just
 geçen hafta.
 last week.
 ‘They were three people to swim in this pool just last week.’

If that is correct, then another question arises: would the meaning achieved in (72b) be also achieved without this complex structure by just having *üç kişi* ‘three person’ as in (72a), which may be a future research question.

Another interesting result observed with numerally quantified subjects was observed in Region 6, where 3PL plural was easier to process than 3SG, which contradicts the existing descriptive grammars (Göksel & Kerslake, 2004; Kornfilt, 1997), which state that third person singular verb morphology is preferable to third person plural verb morphology with third person plural subjects, as I mention above. Therefore, the reversed preference (3PL over 3SG) that I observed in my experiment may be about the nature of quantified subjects, possibly about the fact that they do not carry an overt plural marker within the DP, in contrast to the regular plural subjects. Thus, if there is a ban in the language against repeated marking of the plurality, as suggested for the DP-internal syntax by Ortmann (2000), plurality-denoting subjects *without* an overt plural marker would be less offensive with verbs marked for plural than subjects that carry an overt plural marker.

Finally, I found that my participants processed Region 5 slower than Region 6. This is not surprising if in Region 5 the participants were still retrieving and recalculating the whole structure, which they started doing when they first saw a mismatch in the subject-verb agreement. This happened in Region 4, which contained the verb. When they moved onto the next region, Region 6, the structure has already been recalculated. In my experiment, Region 5 was actually the first *spillover* region because the participants first became aware of the agreement mismatch in Region 4, upon encountering the verb. In other words, Region 6 is expected to be easier because by then the analysis has been consolidated.

2.3.6.2. Conclusion

According to my experimental results, first of all, the processing of a numerally quantified subject is not more complicated when there is an agreement mismatch between the subject and the verb than when there is a match: in fact, it is more

preferable. Second, there is no difference between the processing of plural verbal agreement with numerally quantified subjects and numeral pronouns although numeral pronouns were expected to be easier to process because of the existence of an overt person indication on the subject.

Therefore, both of these comparisons: one with numeral pronouns and one with numerally quantified subjects suggest that 3SG is more complicated to process than any other agreement morphology. If we believe that the underlying structure of a numerally quantified subject with 1st person plural agreement is a consequence of the subject containing a non-finite clause, we may speculate that the processing of non-finite structures is relatively easy. This might be tested by comparing the processing of non-finite versus finite embedded structures in Turkish; e.g., examining whether the processing of non-finite complementation in (73a) is easier than the processing of finite complementation in (73b).

- (73) a) Ahmet Ayşe'-nin ev-e git-tiğ-in-i sandı-Ø.
 Ahmet.NOM Ayşe-POSS home-DAT go-NMZ-3SG-ACC think-PAST-3SG
 ‘Ahmet thought that Ayşe went to the home.’
- b) Ahmet Ayşe ev-e git-ti- Ø sandı-Ø.
 Ahmet.NOM Ayşe-NOM home-DAT go-PAST-3SG think-PAST-3SG
 ‘Ahmet thought that Ayşe went to the home.’

2.3.6.3. Limitations and Suggestions for Further Research

One point that needs to be improved in my study is the number of the items and the participants. The reason behind it is that no significant effect of agreement in by-item analysis has been found. The absence of a significant difference may be a consequence of the low statistical power.

Another possible control measure that could have been taken in the study, but was not is to control for second/foreign languages other than English that participants may

have known. That way, any possible influence of a non-native language on the results would have been preempted.

For further research, the processing of 3rd person singular and 3rd person plural agreement with regular plural subjects (e.g., çocuklar ‘children’) can be investigated. Also, the processing of 3rd person agreement between numeral quantifiers as in (74a) and numeral pronouns as in (74b) may be compared to discover whether any difference in the processing of them exists or not.

- (74) a) Üç kişi okul-a git-ti-Ø(ler).
three person school-DAT go-PAST-3SG(3PL)
‘Three people went to the school.’
b) Üçü okul-a git-ti Ø(ler).
Three of them school-DAT go-PAST-3SG(3PL)
‘Three of them went to the school.’

CHAPTER 3

EXPERIMENT II:

COMITATIVE CONSTRUCTION

This chapter outlines Turkish comitative construction from both a theoretical and an experimental perspective. I begin with an investigation of the comitative construction across different languages and discuss its two interpretations: a symmetrical and asymmetrical one. Then, I present a more detailed description of Turkish comitative construction. I continue with the design, method and results of my experiment, in which I tested various interpretation of the comitative construction in Turkish. I end the chapter with a discussion of the results and a brief conclusion.

3.1. Background

Comitative Construction: Overview

Comitative is an umbrella term used to convey the relations of instrumentality and accompaniment (Haspelmath, 2004; McNally, 1993; Stassen, 2000; Stolz et al., 2006). Almost all languages have their way to express comitative meaning and employ a variety of markers to express the comitative, such as *with* in English, *mit* ‘with’ in German, *ile* ‘with’ in Turkish. Comitative constructions receive three different interpretations, given in (75):

- (75) “a) Accompaniment: Two participants of the same predicate fulfill the same role,

- b) Instrumental: One participant serves as the tool with which another participant carries out an action,
- c) Modal: an adverbial modification of a predicate.” (Stolz et al., 2006: 2)

The example sentences in (76) illustrate these relations in English, but they are not specific to English, and constitute a universal pattern.

- (76) a) *Accompaniment*: My sister has breakfast *with her boyfriend*.
 b) *Instrument*: I cut the bread *with the knife*.
 c) *Modal*: She is waiting for news *with excitement*.

Although I will review briefly the instrumental and modal usages of the comitative construction, this chapter will focus on its expression of the accompaniment relation.

The connection between accompaniment and instrumentality is observed in most languages. Accompaniment is usually shown with the same word or grammatical device denoting instrumentality (Lakoff & Johnson, 1980). That is why it is not rare to see that the comitative construction showing instrumentality is also an indicator of accompaniment.

Across languages, two DPs in a comitative construction (e.g., *my sister* and *her boyfriend* in (76a) can be of an equal status or one DP can be more prominent than the other. Aissen (1989) also claims that the comitative construction is ambiguous between the two interpretations above. For the purposes of this thesis, I will refer to the first reading – the reading similar to that of coordination – as the *symmetrical comitative* and to the second one – the reading where the comitative is interpreted as a DP modified by a PP – as the *asymmetrical comitative* (Zhang, 2007).¹³ In other words, I will use Zhang’s terms: *symmetrical* and *asymmetrical comitative* to refer to coordination vs. non-coordination use of the comitative.¹⁴ As stated above, the

¹³ Zhang (2007) discusses English only, but in English comitative construction behaves a little differently than in the other languages in that it never allows plural agreement.

¹⁴ According to Zhang (2007), comitative construction in English is not always asymmetrical, but its symmetry is only about semantics, and not syntax. See Zhang (2007) for details.

symmetrical interpretation of the comitative is similar to coordination: both DPs denote equal participants in an event and this is reflected on the predicate, which carries plural agreement. On the other hand, when a comitative construction is interpreted asymmetrically, one DP has a privileged status (both syntactically and semantically) and it is this one that controls agreement, while the other DP is interpreted as an adjunct. The symmetrical and asymmetrical interpretation of a comitative construction are illustrated in (77a) and (77b) respectively.¹⁵

- (77) a) Anna s Natasej videli sebja v zerkale. [sym] *Russian*
 Anna.NOM with Natasej.INSTR saw.PL self in mirror
 ‘Anna and Natasha saw themselves in the mirror.’ (McNally, 1993, p. 355)
- b) Ahmet ile ben geçen hafta ödev yap-tı-m. [asym] *Turkish*
 Ahmet.NOM with I last week homework do-PAST-1SG
 ‘I did the homework with Ahmet last week.’

In some languages, there is no other word for coordination besides the comitative marker, and the comitative structure is used both for coordination and accompaniment. An example of such a language is Shona, whose accompaniment construction is illustrated in (78a) and coordination in (78b); both make use of the same lexical item: *na* ‘with/and’.

- (78) a) wa-ka-dzoka na-ye *Shona*
 3SG-PAST-return with-3SG
 ‘He returned with him.’ (Fortune, 1955, p. 399)
- b) Sadza na-Gutu va-uya
 Sadza and/with-Gutu 3PL-come-PF
 ‘Sadza and Gutu have come.’
 (Fortune, 1955, p. 419 as cited in Stassen, 2000)

¹⁵ Here and in the remainder of the chapter I will be using my own glossing conventions regardless of what type of gloss is used in the original sources.

On the other hand, in some languages, the comitative construction is not ambiguous, and it is only used to express accompaniment (i.e., only the asymmetrical interpretation is available). This is shown in (79a) and (79b) from Maltese, where a conjunction *u* ‘and’ is used to convey the meaning of coordination in (79a), and a different, comitative marker is used to convey the meaning of accompaniment in (79b).

- (79) a) *is-sikkina u l-furketta ssaddu* *Maltese*
 ART-knife and ART-fork grow-rusty-3PL-PF
 ‘The knife and the fork have grown rusty.’ (Aquilina, 1965: 189)
- b) *gie ghandi b-il-kelb mieghu.*
 come.3SG.PF at.me with-ART-dog with.him
 ‘He came to my house with his dog.’
 (Aquilina, 1965, p. 109, as cited in Stassen, 2000)

There are, however, also languages where the comitative construction is ambiguous between symmetrical and asymmetrical reading despite the fact that the language also possesses a separate coordinator. Turkish is such a language, as seen in (80a and (80b), where the usage of the comitative marker *ile* ‘with’ results in ambiguity: (80a) illustrates a symmetrical (coordination) reading of the comitative, and (80b) illustrates an asymmetrical reading of the comitative. This is despite the fact that the language has an unambiguous coordination structure, shown in (81).

- (80) a) *Ahmet ile ben geçen hafta ödev yap-tı-k.* *Turkish*
 Ahmet.NOM with I last week homework do-PAST-1PL
 ‘Ahmet and I did the homework last week.’
- b) *Ahmet ile ben geçen hafta ödev yap-tı-m.*
 Ahmet.NOM with I last week homework do-PAST-1SG
 ‘I did the homework with Ahmet last week.’
- (81) *Ahmet ve ben geçen hafta ödev yap-tı-k.*
 Ahmet.NOM and I last week homework do-PAST-1PL
 ‘Ahmet and I did the homework last week.’

In the following sections, I discuss each group of languages in turn.

3.1.1. Comitative Construction with both Symmetrical and Asymmetrical Interpretation (WITH-languages)

As mentioned above, there are some languages that use the same marker to express comitative ('X *with* Y') and coordination ('X *and* Y'). These languages, in which comitative construction can be interpreted both asymmetrically (as a prepositional phrase) and symmetrically (as a coordinated structure), are called WITH-languages (Stassen, 2000). WITH-languages utilize only the *Comitative Strategy* to create a constituent consisting of two DPs, which may denote entities of equal or unequal status. This is the case in Haitian, Arawakan, Iraqw, Mandarin, Japanese as well as most other Oceanic languages. An example from Jacaltec (Mayan) language is presented in (82).

- (82) chin to boj hach *Jacaltec (Mayan)*
 1.SG go and/with 2.SG
 'You and I go/I go with you.' (Craig, 1977, pp. 30, 32)

3.1.2. Comitative Construction with Only an Asymmetrical Interpretation (AND-languages)

In some languages, the comitative construction is always interpreted asymmetrically, and it does not have the symmetrical reading, i.e., that of coordination. Such languages, in which there is a difference between the lexical item *with* and the lexical item *and*, are called AND-languages. These languages, like WITH-languages, have the *Comitative Strategy*, which results in an unequal structural rank of the two DPs. When such a comitative construction containing two singular DPs is used as a subject, the verb is marked with singular agreement. In addition to the *Comitative Strategy*, such languages also employ the *Coordinative strategy* (Stassen, 2003), in which the two DPs are assigned equal structural rank both semantically and syntactically and these

DPs bear the same case. When the coordinated phrase is used as the subject, the predicate carries plural morphology. AND-languages have a unique particle for coordination. The usage of such particle (coordinator) results in a phrase that is subject to the Coordinate Structure Constraint (CSC) (Ross, 1967), which disallows extraction of a conjunct (or a part of a conjunct) from a coordinated phrase. Thus, CSC does not allow extraction of any DPs from the phrase. AND-languages are mostly seen in Europe, such as English, but also in many other language families, such as Australian languages, languages of New Guinea, Middle East and language families of Northern Africa (Stassen, 2000). Several sentences illustrating comitative and coordination in English were already presented in (76a) and some Tamil examples are given in (83a) and (83b), where (83a) illustrates a coordination phrase, and (83b) a comitative construction.

- (83) a) Raaman-um Murukan-um vantaagka Tamil
 Raman-and Murugan-and come.PAST.3PL
 ‘Raman and Murugan came.’ (Asher, 1982, p. 67)
- b) naan appaa-kuute Cennekki pooreen
 1SG father-with Madras-DAT go.PRSN.SG
 ‘I am going to Madras with my father.’ (Asher, 1982, p. 112)

3.1.3. AND-languages with ambiguous comitative construction

All of the AND-languages employ both coordinative and comitative strategies. However, while some languages are “pure” AND-languages, some of them also use comitative strategy to form a coordination phrase. These languages are called *quasi-comitative* (Dyba, 1988). The *quasi-comitative* languages are languages in which the use of a comitative construction as the subject may trigger plural agreement on the predicate. In other words, the comitative construction in these languages may display syntactic properties of coordinated constructions. In addition to having a comitative particle, which can function as a coordinator or as a preposition *with*, these languages have another lexical particle that unambiguously expresses coordination. Such languages are e.g., Russian, Polish, Turkish, and to some extent, Hungarian. In quasi-

comitative languages, the comitative construction can be interpreted either asymmetrically or symmetrically. In other words, the comitative particle in these languages may combine two DPs so that neither DP is more prominent than the other, in which case the verb shows plural agreement ([DP₁ with DP₂ VP-Pl]), indicating a coordinated structure, or it may combine two DPs so that one is more prominent than the other, in which case it effectively combines an DP with a PP adjunct ([DP₁ [PP with DP₂] VP-Sg]), and the verb shows singular agreement.¹⁶ Examples from Turkish, repeated here from (80) and (81), illustrate the comitative/coordinate paradigm of quasi-comitative languages.

- (84) a) Ahmet ile ben geçen hafta ödev yap-tı-k. *Turkish*
 Ahmet.NOM with I last week homework do-PAST-1PL
 ‘Ahmet and I did the homework last week.’
 b) Ahmet ile ben geçen hafta ödev yap-tı-m.
 Ahmet.NOM with I last week homework do-PAST-1SG
 ‘I did the homework with Ahmet last week.’
- (85) Ahmet ve ben geçen hafta ödev yap-tı-k. *Turkish*
 Ahmet.NOM and I last week homework do-PAST-1PL
 ‘Ahmet and I did the homework last week.’

In the remainder of the chapter I discuss the properties of symmetric and asymmetric comitative construction and ways to distinguish between the two.

3.1.4. Comitative Construction: Analysis

Zhang (2007) claims that in English, a comitative construction consists of a complex DP consisting of two DPs and *with* [DP₁ with DP₂]. She purports that this complex DP can be one of two types of comitative structure: asymmetrical and symmetrical, as

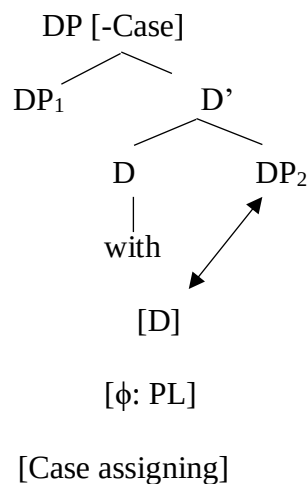
¹⁶ There is a tendency to see comitative coordination (symmetric comitative construction) as regular coordination; however, it was claimed that comitative coordination may create an unequal structural rank between two participants semantically (Haspelmath, 2004; Stassen, 2000; Stolz et al., 2006; Trawinski, 2012). In other words, the comitative coordination provides an equal structural rank syntactically, but the inequality is still present semantically.

shown in (86). The symmetrical structure always carries a plural feature on it, which provides plural agreement on the verb, as shown in (86a), while in the asymmetrical one, the second cluster [with DP₂] is optional, although it can take place in the preverbal subject position, as shown in (86b).

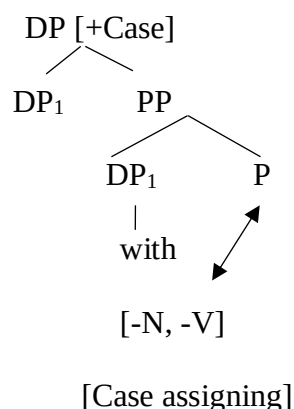
- (86) a) Masa s Dasei xodjat v skolu. [sym] *Russian*
 Masha.NOM with Dasha.INSTR go.PL to school
 ‘Masha and Dasha go to school.’
 b) Masa s Dasei xodit v skolu. [asym]
 Masha.NOM with Dasha.INSTR go.SG to school
 ‘Masha goes to school with Dasha.’ (Feldman, 2001, p. 3)

Zhang proposes that asymmetrical comitatives include *with* as a regular preposition and that the PP headed by *with* attaches to DP₁ as an adjunct, as shown in (87b). On the other hand, in the symmetrical comitative construction, *with* possesses the features of Case Assigning, D, and Plural; DP₂ is its complement and DP₁ is its Specifier, as shown in (87a).

- (87) a) Symmetrical Comitative



b) Asymmetrical Comitative



(Zhang, 2007, p. 20)

3.1.4.1. Diagnostics of symmetrical or asymmetrical comitative construction

To differentiate between the two strategies shown in (87a-b), previous literature has presented various diagnostics (Feldman, 2001; Zhang, 2007). Firstly, the asymmetrical structure (but not the symmetrical one) has an *optional* cluster [with DP], which is an adjunct, not the complement of the comitative particle as in (88a) (Zhang, 2007). As this cluster is optional, when it is omitted, it does not cause ungrammaticality, as shown in (88b).

- (88) a) Hasan ile sen sinema-ya git-ti-n.
 Hasan.NOM with you cinema-DAT go-past-2SG
 ‘You went to the cinema with Ali.’
 b) Sen sinema-ya git-ti-n.
 you cinema-DAT go-past-2SG
 ‘You went to the cinema.’

Secondly, the cluster in the asymmetrical comitative construction can move to an A-bar position unlike in the symmetrical one, as shown in (89a-b) (Zhang, 2007).

- (89) a) *The apple with the orange, Mary compared. [sym]
 b) This is the fish with wine sauce that I bought. [asym] (Zhang, 2007, p. 8)

- ‘The dog bit Victor and Natasha.’ (McNally, 1993, p. 352)
- (93) Ale nas z Ewa nie potrzebowali przekonywac. *Polish*
 but us.ACC with Ewa.INSTR NEG need.PAST.3PL.VIRILE convince.INF
 ‘But they did not have to convince Eve and me.’ (Dyla & Feldman, 2008, p. 23)

The same is true of the indirect object position: a symmetric comitative (where the two DPs are semantically on a par with each other) can serve as an indirect object, as shown in (94b), which is interpreted exactly the same as the regular coordination in (94a).

- (94) a) Ja podarila Viktoru i zene podarok. *Russian*
 I presented V.-DAT and wife-DAT gift-ACC
 ‘I gave Victor and his wife a gift.’
 b) Ja podarila Viktoru s zenoj podarok.
 I presented V.-DAT with wife-INSTR gift-ACC
 ‘I gave Victor and his wife a gift.’ (McNally, 1993, p. 352)

On the other hand, when one of the participants in the comitative construction is interpreted as an adjunct to the other (asymmetrical reading), then the comitative construction cannot serve as an indirect object, as shown by (95).

- (95) Ja podarila Viktoru podarok s zenoj.
 I presented V.-DAT gift-ACC with wife-INSTR
 ‘I gave Victor the gift and his wife (as the gift).’
 ‘My wife and I gave Viktor the gift.’
 (Not: ‘I gave Viktor and his wife the gift.’) (McNally, 1993, p. 350)

Another factor which helps to differentiate between symmetrical comitative construction (comitative coordination) and asymmetrical comitative construction (PP structure), is whether a constituent of a complex comitative DP structure can move out of the phrase (Kayne, 1994; Al Khalaf, 2018). Prior research substantiates the theory that in a coordination structure, moving anything out of a coordinated phrase is strictly forbidden (Ross, 1967; Levine, 2001; Zhang, 2009, among others). Ross (1967:161)

called this phenomenon the Coordinate Structure Constraint (CSC), which I referred to in section 3.1.2 above. The CSC is defined in (96).

(96) The Coordinate Structure Constraint

In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

If a comitative construction functions as coordination, then CSC would apply to this construction and it would be impossible to move a DP out of it. Two sentences from Polish in (97) exemplify this. As comitative construction functions as coordination structure in Polish when the verb shows plural agreement, it creates ungrammaticality when a constituent moves out of the phrase.

- (97) a) Z kim Janek poszedl na spacer? *Polish*
with whom.INST Janek.NOM went.3SG for walk
'With whom did John go for a walk?'
b) *Z kim Janek poszli na spacer?
with whom.INST NOM went.3PL for walk (Dyla, 1988, p. 388)

Finally, the ability of a DP comitative construction to antecede reflexives helps us understand whether it is a comitative coordination or not. If the reflexive is not bound by the whole phrase as a unit, then DP can be called asymmetrical (accompaniment) and if the whole phrase can be the antecedent of a reflexive, then the comitative construction is symmetrical (coordination). To exemplify, In a Russian comitative construction, it is possible to see that the comitative coordination phrase as a unit antecedes the reflexives as in (98a) and (98b) (Feldman, 2001; McNally, 1993).

- (98) a) Anna s Natasej videli sebja v zerkale. *Russian*
Anna.NOM with Natasej.INSTR saw.PL self in mirror
'Anna and Natasha saw themselves in the mirror.'
b) Anna s Petej citajut svoi knigi.
Anna.NOM with Petej.INSTR read.3PL self's books.ACC

‘Anna and Peter are reading their books.’ (McNally, 1993, p. 355)

To summarize, there are several diagnostics to determine the syntactic structure of a comitative construction: numeral agreement, syntactic distribution, extraction and reflexive binding. The next section discusses Turkish comitative construction and investigates how the diagnostics presented above are applicable to Turkish comitatives. At the end of this section, the possible syntactic structures of the comitative structure in Turkish is introduced.

3.1.5. Comitative in Turkish

Comitative Construction in Turkish is formed by a free post-position *ile* ‘with’ and its bound allomorphs *-(y)la/le* when attached to the word, as in (99a-b).

- (99) a. Ali ile / Ali’yle Mehmet ev-e git-ti-Ø. Turkish
 Ali-with / Ali-with Mehmet.NOM home-DAT go-PAST-3SG
 ‘Ali and/with Mehmet went home.’
 b. Araba ile / araba-yla Ali ev-e git-ti- Ø.
 car with / car-with Ali.NOM home-DAT go-PAST-3SG
 ‘Ali went home by car.’

The post-position *ile* ‘with’ has a variety of functions in Turkish: it can denote instrumentality, coordination or modality. Accordingly, the comitative construction may have an instrumental reading, as shown in (100).

- (100) Ali elma-yı bıçak-la kes-ti. Turkish
 Ali apple-ACC knife-INSTR cut-PAST-3SG.
 ‘Ali cut the apple with a knife.’

Secondly, the comitative construction may serve as a modal modifier of the predicate, as in (101).

(104) Ahmet ile ben sinema-ya git-ti-m. *Turkish*
 Ahmet.NOM with I cinema-DAT go-PAST-1SG
 ‘I went to cinema with Ahmet.’

(105) Ahmet ve/ile ben sinema-ya git-ti-k. *Turkish*
 Ahmet with I cinema-DAT go-PAST-1PL
 ‘Ahmet and I went to cinema.’

¹⁹ Kornfilt (2018) also claims that Turkish comitative construction has a dual nature. The first one is an only comitative nature, in which the comitative marker functions as a preposition and it is the head of a PP. Its second function is being a special coordinator coordinating two DPs, one of which can be overt or a small *pro*. Kornfilt's focus is on sentences like (ia), where agreement is plural, and one of the arguments of the verb is *pro*. Kornfilt argues that (ia) is three-way ambiguous, as indicated by the translations in (ib-d).

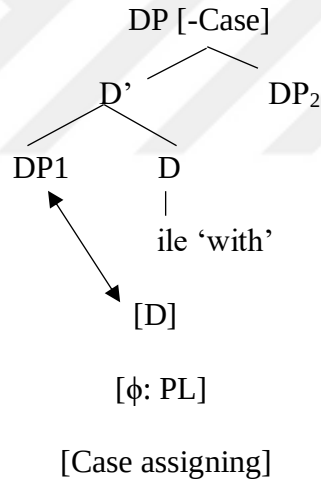
- i. a. Hasanla sinemaya gittik.
Hasan-WITH cinema-DAT go-PAST-1PL
b. 'Hasan and I went to the movies.'
c. 'Hasan and we went to the movies.'
d. 'We went to the movies with Hasan.'

- (106) *Benim öğretmenim güzel ile zeki. Turkish
 1POSS teacher beautiful with smart
 Int. ‘My teacher is beautiful with smart.’

The interesting thing is that the only difference between sentences in (104) and (105) is the agreement on the verb and it cannot be understood whether *ile* ‘with’ heads a prepositional phrase (*Ahmet ile ben* ‘I with Ahmet’) or functions as a coordinator (*Ahmet ile ben* ‘Ahmet and I’) until the end of the sentence. This creates an ambiguity for the readers, which is only resolved once the verb is encountered.

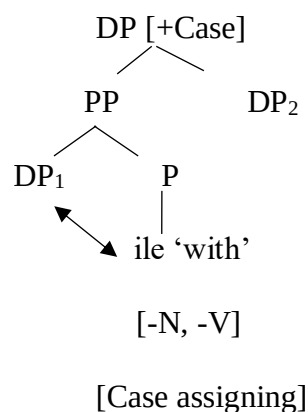
Following Zhang (2007), two different syntactic trees may be drawn for the two interpretations presented above. I adopted Zhang’s (2007) structures, shown in (107), adapting them to Turkish being a head-final language.²⁰

- (107) a) Symmetrical Comitative



²⁰ Another syntactic representation of a comitative construction was proposed by Kornfilt (2018). She took Aissen’s (1989) syntactic representation as her starting point, but she argued that the subject comitative construction with plural agreement can receive one of three possible syntactic structures: two in which the subject is a coordinate phrase and one in which the sole subject is the 1st person plural *pro* with a PP headed by *ile* ‘with’ being external to the subject. For the sake of this thesis, I adopted Zhang’s representation as it indicates case assigning relationship explicitly.

b) Asymmetrical Comitative



3.1.5.1. Diagnostics of Turkish symmetrical or asymmetrical comitative construction

Just like in other languages, comitatives in Turkish can be differentiated according to several criteria. The most obvious evidence for whether the comitative structures is used symmetrically or asymmetrically is the agreement on the verb.

In Turkish, regular coordinator *ve* 'and' generally requires plural agreement. When one of the phrases in a coordinated structure is 1st person singular or 2nd person singular, the verb necessarily shows plural agreement, as in (108a) and (108b).

- (108) a) Ben ve Ayşe sinema-ya git-ti-k/*git-ti. *Turkish*
 I and Ayşe.NOM cinema-DAT go-PAST-1PL/*3SG
 'Ayşe and I went to the cinema.'
- b) Sen ve Ayşe sinema-ya git-ti-niz/*git-ti.
 you and Ayşe.NOM cinema-DAT go-PAST-2PL/*3SG
 'You and Ayşe went to the cinema.'

However, agreement behaves differently when the coordinated phrases are 3rd person singular; the preferred agreement in this case is singular, as shown in (109a), although plural agreement is possible, as illustrated in (109b).

- | | | | | | | | |
|-------|----|------------------------------------|-----|----------|------------|-------------|----------------|
| (109) | a) | Ali | ve | Ayşe | sinema-ya | git-ti. | <i>Turkish</i> |
| | | Ali.NOM | and | Ayşe.NOM | cinema-DAT | go-PAST-3SG | |
| | | ‘Ali and Ayşe went to the cinema.’ | | | | | |
| | b) | ?Ali | ve | Ayşe | sinema-ya | git-ti-ler. | |
| | | Ali.NOM | and | Ayşe.NOM | cinema-DAT | go-PAST.-PL | |
| | | ‘Ali and Ayşe went to the cinema.’ | | | | | |

The preference for singular agreement with 3rd person subjects is not specific to coordination, but is attested more generally, as shown in (110), where the subject is 3rd person plural phrase *çocuklar* ‘children’.²¹

- (110) Çocuklar sinema-ya git-ti/?git-ti-ler.
Children cinema-DAT go-PAST-3SG/go-PAST-3PL
'The children went to the cinema.'

However, when the DP is inanimate, the plural agreement becomes not only dispreferred, but ungrammatical, as shown in (111).

- (111) Belgeler gitti/*gittiler. Turkish
document.PL go.PAST.3SG/*go.PAST.3PL
‘*Documents is gone.’

In terms of agreement, the symmetrical comitative coordination behaves the same as the regular coordination: when one of the coordinated phrases is 1st or 2nd person singular, the verb necessarily shows plural agreement, as shown in (112a-b). If both phrases are 3rd person singular, as in (113), then the preferred agreement on the verb is singular, as shown in (113).

- (112) a) Ayşe ile ben sinema-ya gittik/*gitti/*gittim.
Ayşe.NOM with I cinema-DAT go-PAST-1SG/*go-PAST-3SG/*go-PAST-1SG
'Ayşe and I went to the cinema.'

²¹ See Section 1.1. Subject-Verb Agreement in Turkish for further information.

- b) Ayşe ile sen sinema-ya gittiniz/*gitti/*gittin.
 Ayşe.NOM with you cinema-DAT go-PAST-2PL/*go-PAST-3SG/*go-PAST-2SG
 ‘You and Ayşe went to the cinema.’
- (113) Ayşe ile Ali sinema-ya git-ti/?git-ti-ler.
 Ayşe.NOM with you cinema-DAT go-PAST-3SG/?go-PAST-3PL
 ‘Ayşe and Ali went to the cinema.’

- (114) a) Ayşe ile ben sinema-ya git-ti-m. [asym] Turkish
Ayşe.NOM with I cinema-DAT go-PAST.1SG
'I went to the cinema with Ayşe.'
- b) Ayşe ile ben sinema-ya git-ti-k. [sym]
Ayşe.NOM with I cinema-DAT go-PAST-1PL
'Ayşe and I went to the cinema.'
- (115) a) Ayşe ile sen sinema-ya git-ti-n. [asym]
Ayşe.NOM with you cinema-DAT go.PAST.2SG
'You went to the cinema with Ayşe.'
- b) Ayşe ile sen sinema-ya git-ti-niz. [sym]
Ayşe.NOM with you cinema-DAT go-PAST-2PL
'You and Ayşe went to the cinema.'
- (116) a) Ali ile Ayşe sinema-ya git-ti. [asym] or [sym]
Ali.NOM with Ayşe.NOM cinema-DAT go-PAST-3SG/ go-PAST-3PL
'Ayşe went to the cinema with Ayşe.'
- b) Ali ile Ayşe sinema-ya git-ti-ler. [sym]
Ali.NOM with Ayşe.NOM cinema-DAT go-PAST-3PL
'Ali and Ayşe went to the cinema.'

(119) Ben, Ahmet ile Ali'ye soru sor-du-m.
I, Ahmet NOM with Ali.NOM.DAT question ask.PAST.1SG
'I asked a question to Ahmet and Ali.'

- (119) Ben, Ahmet ile Ali'ye soru sor-du-m.
I, Ahmet NOM with Ali.NOM.DAT question ask.PAST.1SG
'I asked a question to Ahmet and Ali.'

(120) a) Ahmet ve ben sinema-ya git-ti-k.
 Ahmet.NOM and I cinema-DAT go-PAST-1PL
 ‘Ahmet and I went to the cinema.’
 b) *Ahmet ve sinema-ya gittik ben.
 *Ahmet.NOM and cinema-DAT go-PAST-1PL I
 ‘*Ahmet and went to the cinema.’

- (120) a) Ahmet ve ben sinema-ya git-ti-k.
Ahmet.NOM and I cinema-DAT go-PAST-1PL
'Ahmet and I went to the cinema.'
- b) *Ahmet ve sinema-ya gittik ben.
*Ahmet.NOM and cinema-DAT go-PAST-1PL I
'*Ahmet and went to the cinema.'

(121) a) Ahmet sinema-ya gitti.

- (121) a) Ahmet sinema-ya gitti.

‘Ahmet went to the cinema.’

Cinema-DAT go-PAST-3SGAhmet.NOM

‘Ahmet went to the cinema.’

(122) a) Ahmet ile ben sinema-ya git-ti-k. *Turkish*

Ahmet.NOM with I cinema-DAT go-PAST-1PL

‘Ahmet and I went to the cinema.’

b) *Ahmet ile sinema-ya git-ti-k ben.

Ahmet.NOM with cinema-DAT go-PAST-1PL I

(122b) violates the Coordinate Structure Constraint (CSC). Therefore, this diagnostics could be also an argument that Turkish comitative construction with plural agreement is symmetrical.

The criterion referred to above is valid for the sentences with plural agreement. When the agreement is singular, extraction is possible, as in (123a and (123b.

(123) a) Ahmet ile ben sinema-ya git-ti-m. Turkish

Ahmet.NOMwith I cinema-DAT go-PAST-1SG

‘I went to the cinema with Ahmet.’

b) Ahmet ile sinema-ya git-ti-m ben.

Ahmet.NOM with cinema-DAT go-PAST-1SG I

I went to the cinema with Ahmet.

3.2. The Significance of the Study

Discussions regarding the comitative coordination construction have been done on a variety of languages, such as European languages: Russian, Polish, Czech; some Oceanic languages; and Romance languages: Spanish, Portuguese (Al Khalaf, 2018; Creissels, 2016; Ojutkangas, 2017; Sokolova, 2019; Trawinski, 2012). Prior research has thoroughly investigated the theoretical and empirical background of the comitative, but there is still no consensus on whether comitative coordination is a regular coordination construction or not. Some contend that comitative and coordination constructions display the same semantic and syntactic properties because comitative coordination is a hybrid construction (Haspelmath, 2004; McNally, 1993; Stassen, 2000; Zhang, 2010) while others purport that they are semantically and syntactically different from one another (Abdoulaye, 2004; Al Khalaf, 2018).

This study aims to establish which reading of the comitative construction is easier to process by the native speakers of the target language, Turkish, when the two readings are disambiguated exclusively through the agreement on the verb. In this respect, this study is unique since there is no literature examining comitative constructions from experimental perspective.

3.2.1. Research Questions

- 1) How are Turkish symmetrical and asymmetrical comitative constructions processed; is one easier to process than the other?
- 2) Do the properties of the singular agreement controller in the comitative construction make one of the two readings more likely?

3.2.2. Expectations

As to the first research question, the lack of experimental evidence regarding the processing of comitatives makes it impossible for me to base my expectations on

anything that was previously found in the literature. However, given that Turkish is an AND-language, which has a coordinator other than *ile* ‘with’, I expect that *ile* ‘with’ is primarily interpreted as a preposition, and only then as a coordinator because of the presence of a true coordinator *ve* ‘and’ in Turkish. Accordingly, I expect the comitative construction featuring *ile* ‘with’ to be initially interpreted as a prepositional phrase and to be processed faster than the comitative coordination structure. In other words, the singular agreement will be preferred to plural agreement.

As to the second research question, the null hypothesis is that the properties (in particular, the person feature) of the singular agreement controller should not have an effect on the interpretation of the comitative construction in Turkish.

3.3. Experiment

Experiment II tested the processing of Turkish comitative construction, characterized by the use of the preposition *ile* ‘with’ (*Bilge ile Deniz* ‘Deniz with/and Bilge’). As stated above, comitative constructions can be interpreted symmetrically, as a coordinated structure, or asymmetrically, as containing a prepositional phrase (Dalrymple et al., 1998; Feldman, 2001; Haspelmath, 2004; Holmberg, 2019; Moravcsik, 2003; Stassen, 2000). If a comitative construction is interpreted as a coordinated structure, then the phrase *Bilge ile Deniz* means ‘Bilge and Deniz’ denotes a *plural* entity, which if used as the subject behaves accordingly, i.e., induces plural agreement on the predicate. If, on the other hand, a comitative construction is interpreted as a prepositional phrase, then *Bilge ile Deniz* means ‘Deniz, with Bilge’. In this case, only the noun *Deniz* is the subject of the sentence, while *Bilge ile* ‘with Bilge’ acts as a modifier. This experiment tested which reading is easier to process in Turkish by manipulating number agreement on the verb: singular agreement indicated that the comitative is analyzed as a prepositional phrase and plural agreement indicated that it is analyzed as a coordinated structure.

3.3.1. Participants

A total of 134 participants (97 females) took part in the experiment. All participants had normal vision or corrected-to-normal vision and hearing. They did not have any language or reading disorder. They were all native Turkish speakers, and they studied English as a foreign language. Their level of English was determined at the beginning of the semester via an in-house placement test, and their level was A1. The reason for choosing the lowest learner group of English for the experiment was to minimize any effect of their English background. They all studied in the preparatory school of a Turkish private university as undergraduate students. Their last completed educational degree was high school. Their ages ranged between 18 and 22 ($M=19.15$, $SD=0.88$).

3.3.2. Instruments

A total of 24 experimental items were designed. In all experimental items, the subject was a comitative construction (e.g., *benle sen* ‘you with me’). All comitative constructions contained two singular DPs. Moreover, one of those DPs was always either the first person singular (1SG) pronoun *ben* ‘I’ or the second person singular (2SG) pronoun *sen* ‘you’. The reason for this choice is the following: Turkish marks number agreement only in 1st and 2nd person. Thus, the (a) examples differ from the (b) examples in (124) and (125).

(124) a) *Ben gel-di-m.*

I come-PAST-1SG

‘I came.’

b) *Biz gel-di-k.*

we come-PAST-1PL

‘We came’

(125) a) *Sen geldin.*

you.SG come.PAST.2SG

‘You came.’

b) *Siz gel-di-niz.*

you.PL come-PAST-2PL
 ‘You came’

However, if the subject is 3rd person, as in (126a-b), then singular agreement is preferred in both singular and plural.

- (126) a) O gel-di.
 He come-PAST-3SG
 ‘He came.’
 b) Onlar gel-di/ler.
 they come-PAST-3SG/3PL
 ‘They came.’

The fact that one of the DPs in a comitative was always 1st or 2nd person singular made certain that different analyses of the comitative (symmetrical versus asymmetrical) would result in different agreement morphology on the verb, as illustrated in Table 7.

Table 7. *Agreement Types in Comitative Coordination in Turkish*

Comitative phrase	Agreement required on coordination analysis (symmetrical reading)	Agreement required on PP analysis (asymmetrical reading)
1SG ile 2SG	1PL	2SG
1SG ile 3SG	1PL	3SG
2SG ile 1SG	1PL	1SG
2SG ile 3SG	2PL	3SG
3SG ile 1SG	1PL	1SG
3SG ile 2SG	2PL	2SG

All experimental items started with a comitative construction. The comitative construction was followed by an adverbial of place marked by locative (e.g., *teknede* ‘on the boat’), ablative (e.g., *sokaktan* ‘along the street’) or dative (e.g., *denize* ‘to the sea’). The next item in the sentence was the verb with a singular or a plural agreement.

The item ended with a time adverbial (*uzun zaman önce* ‘a long time ago’). A complete set of experimental items is given below.

- (127) a) Ben-le sen karanlık sokak-tan geç-iyor-du-n/geç-iyor-du-k
I-with you dark street-ABL pass-PROG.PAST-1SG/1PL
uzun zaman önce.
long time ago
‘You were passing through the dark street with me a long time ago.’
‘You and I were passing through the dark street a long time ago.’
b) Ben-le polis karanlık sokak-tan geç-iyor-du-/geç-iyor-du-k
I-with police dark street-ABL pass-PROG.PAST-3SG/1PL
uzun zaman önce.
long time ago
‘The police was passing through the dark street with me a long time ago.’
‘The police and I were passing through the dark street a long time ago.’
- (128) a) Sen-le ben resim sergisin-de gez-iyor-du-m/-k
with you I exhibition-LOC visit-PROG.PAST-1SG/1PL long
uzun zaman önce.
long time ago
‘You were visiting the painting exhibition with me a long time ago.’
‘You and I were visiting the painting exhibition a long time ago.’
b) Sen-le öğretmen resim sergisin-de gez-iyor-du/gez-iyor-dun-uz
with you teacher exhibition-LOC visit.-PROG.PAST-3SG/2PL
uzun zaman önce.
long time ago
‘The teacher was visiting the painting exhibition with you a long time ago.’
‘The teacher and you were visiting the painting exhibition a long time ago.’
- (129) a) Kaptan-la ben yelkenli tekne-de kal-ıyor-du-m/ kal-ıyor-du-k
with captain I sailboat-LOC stay-PROG.PAST-1SG/1PL
uzun zaman önce.
long time ago.
‘I was staying on a sailboat with the captain a long time ago.’

‘The captain and I were staying on a sailboat a long time ago.’

b) Kaptan-la sen yelkenli tekne-de kalı-yor-dun-/nuz

with captain you sailboat-LOC stay-PROG.PAST-2SG/ 2PL x

uzun zaman önce.

long time ago

‘You were staying on a sailboat with the captain a long time ago.’

‘You and the captain were staying on a sailboat a long time ago.’

The experimental items were written with six verbs (*kalmak* ‘to stay’, *gezmek* ‘visit’, *geçmek* ‘pass’, *kaçmak* ‘run away’, *girmek* ‘enter’, *çıkma* ‘go on’).

The reason why all the experimental items ended with the same adverbial was that the differences in processing of the sentence were expected to be observed in these regions. Another region where a significant difference was expected to emerge was the verb. However, this difference could be the result of the length of the verb because verbs marked with plural agreement are longer than verbs marked with singular agreement. Therefore, two spillover regions following the verb, which were *uzun* ‘long’ and *zaman* ‘time’, were treated as the critical regions. An example of an experimental item divided into regions is given in (130).

- (130) R1 R2 R3 R4 R5 R6 R7 R8
Benle / polis / karanlık / sokak-tan / geç-iyor-duk / uzun / zaman / önce.
with me/police / dark / street-ABL / pass-PROG.PAST-1PL / long/ time / ago./
‘The police and I were passing through the dark street a long time ago.’

The experimental items were distributed across four lists with six experimental items each, mixed with 12 filler items, and pseudorandomized so that two experimental items did not appear consecutively. All fillers were grammatical and they included the same number of words as the experimental items. This was meant to eliminate any effect on processing caused by differences in length. Fillers also started with a subject containing two parts, which was followed by a two-word object of the sentence. The verb followed the object and preceded a time adverbial, as show in (131) and (132).

(131) Hevesli öğretmen renkli kağıt-lar-ı zımbal-ıyordu daha
 enthusiastic teacher colored papers-ACC staple-PROG.PAST-3SG just
 geçen gün.

last day.

‘Enthusiastic teacher was stapling colored papers just the other day.’

(132) Benim annem nakış kursu-na gid-iyor-du daha dün gece.
 1SG.POSS mother embroidery course-DAT go-PROG.PAST-3SG just last night

‘My mother was going to the embroidery course last night.’

Every item was followed by a comprehension question. The comprehension questions were either wh-questions or yes-no questions, equal in number. Care was taken that the comprehension question contained no agreement marking on the predicate that would bias the participants to interpret the comitative as coordination or a preposition phrase. The comprehension questions are illustrated in (133), (134) and (135).

(133) Benle polis karanlık sokak-tan geç-iyordu-k uzun zaman önce.
 with me police dark street-ABL pass-PROG.PAST-1PL a long time ago
 ‘The police and I were passing through the dark street a long time ago.’

Sokak karanlık mıydı?

YES-NO QUESTION

street dark Q. PAST?

‘Was the street dark?’

(134) Senle ben resim sergisin-de gez-iyordu-m uzun zaman önce.
 with you I exhibition-LOC visit-PROG.PAST-1SG a long time ago

‘You were visiting the painting exhibition with me a long time ago.’

Gez-il-en ne sergisi-ydi? 1) Heykel 2) Resim

Visit-PASS-SRC. what exhibition-COP-PAST? 1) Sculpture 2) Painting

‘What was the exhibition that was visited?’ 1) Sculpture 2) Painting

WH- QUESTION

(135) Hevesli öğretmen renkli kağıtları zımbalıyordu daha geçen gün.
 enthusiastic teacher colored papers. ACC staple.3SG.PROG.PAST just last day.

‘Enthusiastic teacher was stapling colored papers just the other day.’

Kağıt-la-rı	zımbalay-an	kim-di?	1) Asker	2) Öğretmen
Paper-PL-ACC	staple-SRC	who- COP-PAST?	1) Soldier	2) Teacher
Who was the one who stapled the papers?			1) Soldier	2) Teacher

WH- QUESTION

Demographic information was collected at the beginning of the first experiment. After the break, the participants assured to continue using the same computer they used in the first experiment. Thus, it was not requested for a second time.

3.3.3. Procedure

A self-paced reading task (SPRT) was used in this experiment, as in Experiment I. A SPR task measures the participants' real-time reading times. This experiment also used a non-cumulative moving-window technique, in which a word is first represented with the dashes on the screen, with each dash masking a word in the sentence. With every press, a word appears, and the previous one disappears. This way, SPRT measures the time passing between two presses and gives the reading time for this word.

The reason for why SPRT was selected for this study was to discover whether any significant difference would occur between the two readings of Turkish comitative construction (the prepositional phrase; the coordinated structure). Given that the analysis assigned to the comitative is indicated by the agreement on the verb (singular indicating the asymmetrical analysis, plural indicating the symmetrical analysis), a significant difference between participants' reading times of singular versus plural verbs or vice versa would indicate which reading of the comitative construction is preferred by native speakers.

The data were collected via Ibex Farm Program, which is an on-line platform used for on-line tasks such as self-paced reading, acceptability judgment or the tasks with flashed sentences (Drummond, 2016). The reason why Ibex Farm was used for this experiment was its ease of accessibility via a link on any browser and providing a data-collection environment including more than one participant. In the task, all of the

sentences and questions were placed in black letters on a papaya-whip background in a pre-set 24-point font. Data were collected in the same computer lab following Experiment I. The participants took the experiment in groups of 15, under the supervision of the researcher and all the participants completed the task on the same kind of computer (Dell Vostro 3670 Intel Core i5). After the participants completed Experiment I, they were given a ten-minute break. After the break, they started with five new practice items to remember the structure of the experiment. After they completed their task, they waited for their peers to finish and they were informed about the aim of these two experiments. The same procedure was implemented for ten different groups.

3.3.4. Data Analysis

The number of correct answers on the comprehension questions was calculated, and the participants whose accuracy was less than 70% of all the comprehension questions were excluded from the study. This caused the exclusion of four participants from the analysis.

The same data trimming process as in Experiment I was performed. Firstly, in order to eliminate extreme values, the reading time of 100 ms was accepted as the low cut-off point and that higher than 3000 ms was referred to as the high cut-off point. Reading times lower than the low cut-point (0.05%) and higher than the high cut-off point (0.2%) were removed and replaced by the mean of that region in that condition.

Secondly, to increase the effect of parametric tests by eliminating outliers, a detailed cleaning was performed. Data were transformed through Lg10 transformation. To detect outliers, standard deviation (SD) was calculated for each item and the RTs above 2.5 SD were removed (Beauprez et al., 2020; Carreiras et al., 2010; Sabourin & Vinerte, 2019; Tun & Wingfield, 1999). These values were replaced by the mean of this region of this specific item. It caused the loss of 4% of the data.

The dependent variable was the reaction time while the independent variables were the agreement on the verb and the second element in the comitative construction (the phrase that controls agreement on the prepositional phrase analysis), henceforth *singular agreement controller*. The agreement variable consisted of two levels (plural and singular) and the singular agreement controller variable had three levels: 1st person (*ben* ‘I’: 1ST), 2nd person (*sen* ‘you’: 2ND), and 3rd person (*o* ‘he/she’: 3RD). The mean RTs for each item were calculated.

To answer my two research questions, two different analysis were conducted. The first analysis was to see which reading is easier to process: asymmetrical (prepositional phrase) or symmetrical (coordinating) structure. Recall also that the verb itself was not considered to be a critical region because the differences in length due to the different agreement morphology may have interfered with reading time differences caused by the agreement type. That is why post-verbal regions: Region 6 and Region 7 were taken as the critical regions. For that, a paired samples t-test was conducted by participant and by item on Region 6 and Region 7.

Secondly, to see possible the effect of the singular agreement controller, a Repeated Measures ANOVA was conducted: F₂ analysis (i.e. by item) had one between subject variable: the singular agreement controller (three levels) and one within subject variable: the agreement (two levels). 2x3 Repeated-Measures ANOVA was conducted with a between subject factor, which was the agreement type on the verb (plural and singular) and a between subject variable, which was the singular agreement controller (1ST, 2ND, 3RD). This analysis was done to see the main effects of agreement and the singular agreement controller on the processing of the comitative construction. Based on the results of Repeated Measures ANOVA, post hoc comparison using the Bonferroni correction were conducted. The final data set was analyzed using Statistical Package for the Social Sciences (SPSS version 26.0) software.

3.3.5. Results

As shown in (136) in the previous section, the experimental items were divided into eight regions. The distribution of regions is repeated below. Recall that the verb itself was not the critical region because the differences in length between singular and plural verbs may have had an effect on the RTs. Thus, Region 6 and Region 7, containing the first two words of the adverbial, were taken as the critical regions.

(136)	R1	R2	R3	R4	R5	R6	R7	R8
	Benle	/ polis	/ karanlık	/ sokak-tan	/ geç-iyor-duk	/ uzun	/ zaman	/ önce.
	with me/police	/ dark	/ street-ABL	/ pass-PROG.PAST-1PL	/ long/ time	/ ago./		
	‘The police and I were passing through the dark street a long time ago.’							

3.3.5.1. Symmetrical Interpretation vs. Asymmetrical Interpretation

To see how symmetrical and asymmetrical comitative constructions are processed and which one is easier to process than the other, the following analysis was conducted.

3.3.5.1.2. Descriptive Analysis

Mean reading times (RTs) for each region in each condition: asymmetrical (indicated by singular agreement) and symmetrical (indicated by plural agreement) were calculated. Figure 7 shows the mean raw RTs by region of comitative construction sentences on asymmetrical and symmetrical reading.

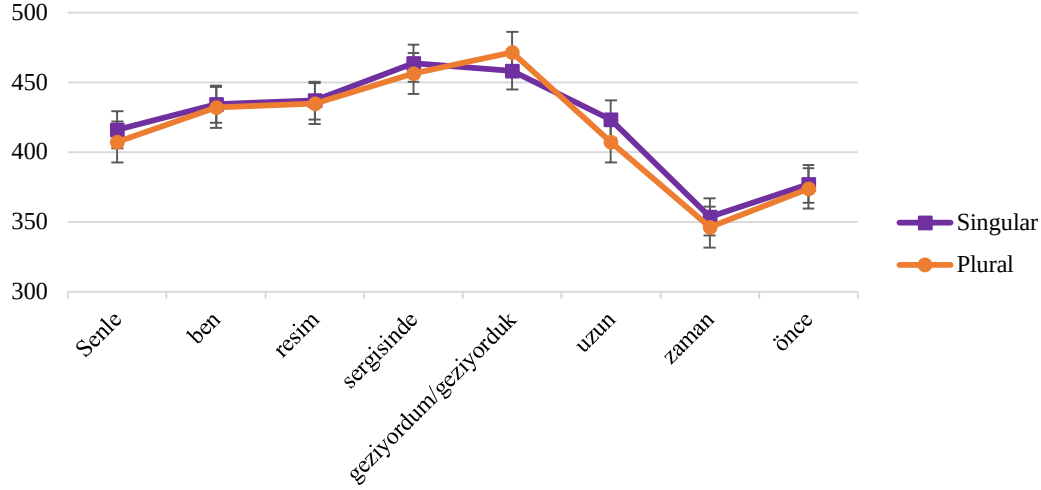


Figure 7. Mean Raw Reading Times of Comitative Construction with Singular and Plural Agreement

3.3.5.1.2. Comparisons

To answer the first research question: Which reading of the comitative construction is easier to process: the asymmetrical or symmetrical, a paired samples t-test was conducted. In Region 6, there was a significant difference between singular agreement ($M=423.4$, $SD=79.54$) and plural agreement ($M=407.4$, $SD=72.44$) ($t_1(129)=3.3$, $p=.001$, $t_2(11)=1.09$, $p=.299$). It demonstrated that plural agreement (symmetrical comitative construction) is easier to process than singular agreement (asymmetrical comitative construction). The reason why the significant difference did not exist in the item analysis may be because of the number of items. On the other hand, the same difference did not occur on Region 7 between singular agreement ($M=353.5$, $SD=65.72$) and plural agreement ($M=346.2$, $SD=65.6$) ($t_1(129)=1.7$, $p=.090$, $t_2(11)=0.44$, $p=.665$). It may be because the first critical region was Region 6 and this was the region that the difference was expected to occur. However, in following region, the surprise effect created by unexpected agreement morphology may have disappeared.

3.3.5.2. Singular Agreement Controller

To see whether the properties of the singular agreement controller in the comitative construction makes one of the two readings more likely, following analysis was conducted.

3.3.5.2.1. Descriptive Analysis

Mean reading times (RTs) for each region in each condition were calculated. Figure 8 shows the mean raw RTs by region of comitative construction sentences with 1st person, as a function of the singular agreement controller and Figure 9 shows the mean raw RTs by region of comitative construction sentences with 2nd person, as a function of the singular agreement controller. Lastly, Figure 10 shows 3rd person, as a function of the singular agreement controller.

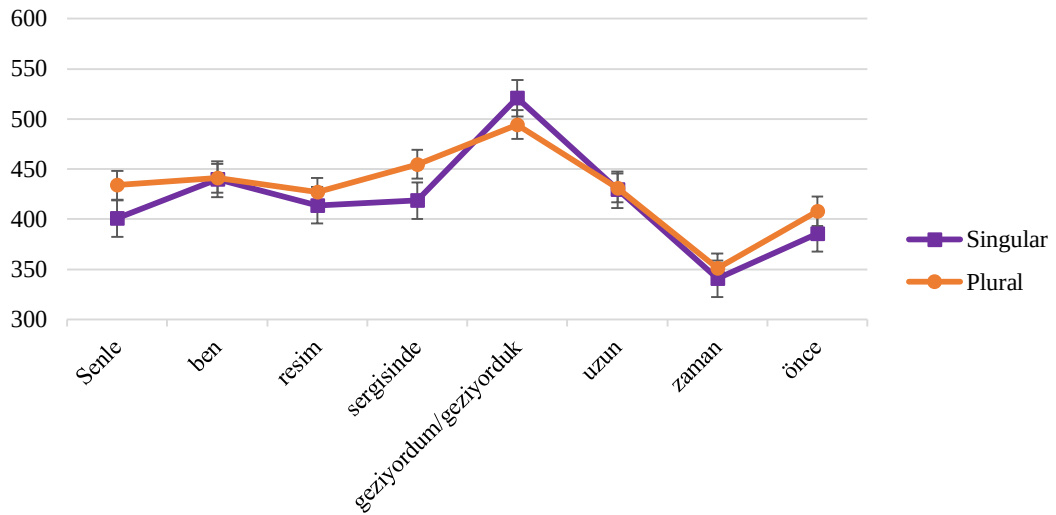


Figure 8. Mean Raw Reading Times of Comitative Construction with 1st as the Singular Element Controller

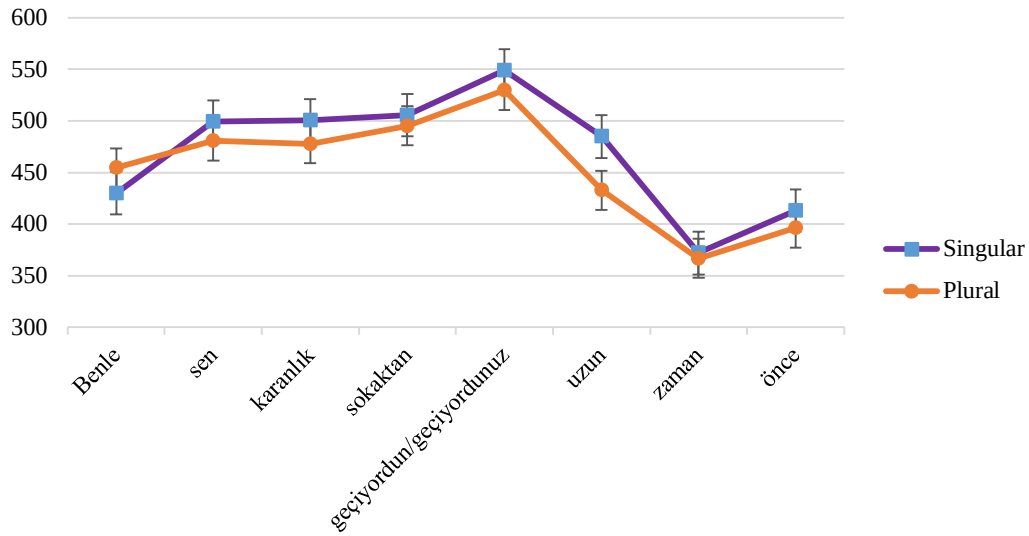


Figure 9. Mean Raw Reading Times of Comitative Construction with 2nd as the Singular Element Controller

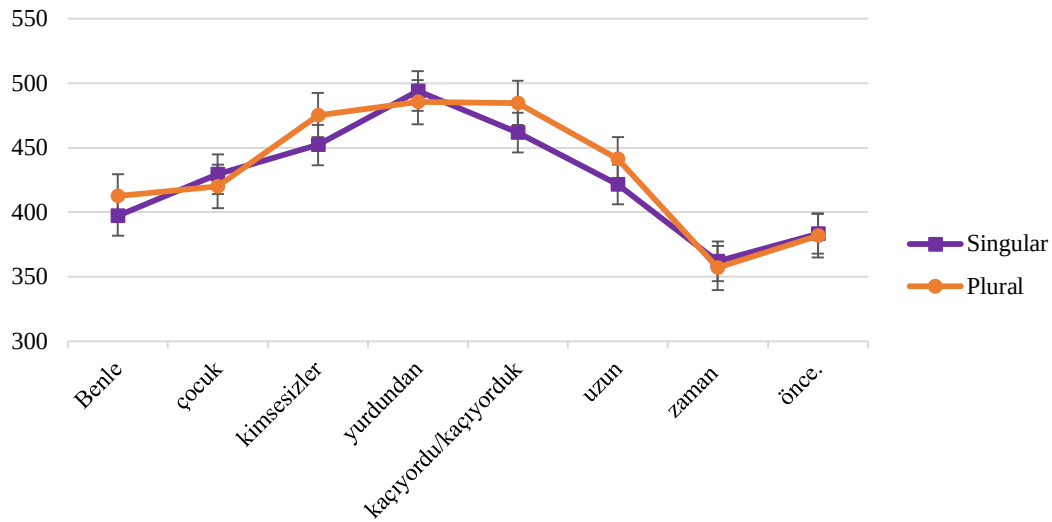


Figure 10. Mean Raw Reading Times of Comitative Construction with 3rd as the Singular Element

2.3.5.2.2. Comparisons

On Repeated-Measures ANOVA Analysis, a Greenhouse-Geisser Adjustment was used when the sphericity assumption was violated. If the sphericity assumption was met, the sphericity assumed adjustment was utilized. First of all, to see any effect of

One-way Repeated-Measures ANOVA was conducted with a within subject factor: agreement type (singular and plural) and a between subject factor: the singular agreement controller (1ST, 2ND, or 3RD). This analysis showed that there was no significant main effect of the agreement type [$F_2(1, 9) = 2.1, p=.177$], but there was a significant main effect of the singular agreement controller [$F_2(1, 9) = 6.6, p=.017$], as well as a two-way interaction between agreement type and the singular agreement controller [$F_2(2, 9) = 5.4, p=.028$] in Region 6. Post hoc comparisons using the Bonferroni correction were conducted because of the significant effect of the singular agreement controller factor. They showed a significant difference between 2ND and 1ST (*sen* ‘you’ and *ben* ‘I’) and a difference between 2ND and 3RD (*sen* ‘you’ and *o* ‘he/she’) ($p<.05$), with items in which the singular agreement controller was *sen* ‘you’ were processed significantly slower than the others and the other two levels (1ST and 3RD) were processed at the same pace.

Another one way Repeated measure ANOVA was conducted to see the effect of agreement type on the other critical region, Region 7. This analysis showed that there was no significant effect of agreement [$F_2(1, 9) = .19, p=.677$], and no significant effect of the singular agreement controller was observed [$F_2(2, 9) = 1.2, p=.338$]. No interaction between agreement type and the second element [$F_2(2, 9) = 0.66, p=.542$]. The reason why no significant effect of the agreement or the second element was found could be because of the low observed power.

Region 8 was not taken into consideration because of the possible effect of the wrap-up effect.

3.3.6. Discussion and Conclusion

In this chapter, I discuss these findings of my experiment in light of the previous literature. I mention possible future research topics. I end the chapter with the limitations of the experiment.

3.3.6.1. Discussion

My interest in this experiment was to compare the processing of symmetrical and asymmetrical interpretations of Turkish comitative construction and to discover the effect of a singular agreement controller on the agreement type from a processing perspective. Therefore, my discussion consists of two parts based on my two research questions:

- 1) How are Turkish symmetrical and asymmetrical comitative constructions processed; is one easier to process than the other?
- 2) Do the properties of the singular agreement controller in the comitative construction make one of the two readings more likely?

3.3.6.1.1. Symmetrical Interpretation vs. Asymmetrical Interpretation

Regarding the question of which reading of the comitative construction (symmetrical and asymmetrical) is easier to process, the only significant difference between the two interpretations was found in Region 6 in the analysis by participant. In other words, I did not find any difference in Region 7, and no difference was found in the by item analysis. Nevertheless, I will discuss the result based on the difference in Region 6 because I believe that in the by item analysis, this difference did not show up because of the low power of the analysis. The explanation for why no significant difference between the reading times of singular and plural agreement emerged in Region 7 may be that the first place where the structure of the subject was disambiguated was the verb region, Region 5, but the differences in this region could not be relied upon because of the difference in the length of the verb in different agreement conditions. So, Region 6 was, in fact, the first *spillover* region so that the surprise effect, first created in Region 5, may have disappeared by Region 7. Therefore, my discussion will rely on this significant difference in Region 6.

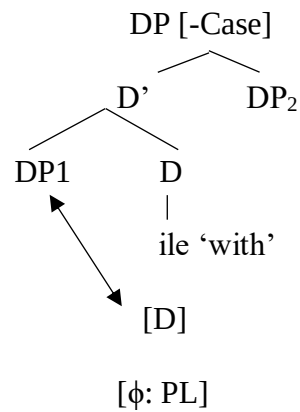
A difference between asymmetrical, in (137a), and symmetrical interpretation, in (137b), is found in favor of the symmetrical interpretation.

- (137) a) Ayşe ile ben sinema-ya git-ti-m. [asym] Turkish
 Ayşe.NOM with I cinema-DAT go-PAST-1SG
 ‘I went to the cinema with Ayşe.’
 b) Ayşe ile ben sinema-ya git-ti-k. [sym]
 Ayşe.NOM with I cinema-DAT go-PAST-1PL
 ‘Ayşe and I went to the cinema.’

In other words, the participants found plural agreement easier to process. They tended to interpret the comitative as a coordination structure, which is very surprising because the main function of a comitative is to provide an accompaniment function, but without affecting the agreement between the subject and the verb. In that sense, plural agreement on the verb represents an *agreement mismatch*. Previous literature indicated that a mismatch in a comprehension task slows down the speakers as it does not fit their expectation (Lago et al., 2015; Lago et al., 2019; Nicol et al., 1997; Pearlmuter et al., 1999, Wagers et al., 2009). My experiment showed the opposite since faster reading times were observed in the mismatch condition (plural agreement). Given the predictive model of subject-verb agreement processing (Tanner & Bulkes, 2015, Wagers et al., 2009), my results indicate that when the participants saw the comitative construction at the beginning of the sentence, they predicted to see plural morphology on the verb. In other words, they interpreted the subject in a way that makes both participants of the construction equally responsible for the action.

Preference for the mismatched agreement morphology means that the comitative construction in Turkish is primarily analyzed as a coordination phrase. This is surprising because in Turkish, there is another (unambiguous) coordinator, *ve* ‘and’. If Zhang’s (2007) analysis, repeated in (138) below from (107), is correct, my results may be taken to indicate that the adjunction structure is harder to process than a complement-and-a-specifier structure, i.e., that (138a) is easier to process than (138b).

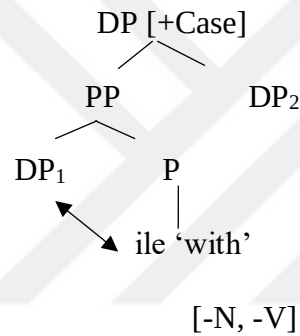
(138) a) Symmetrical Comitative



[ϕ : PL]

[Case assigning]

b) Asymmetrical Comitative

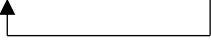


[-N, -V]

[Case assigning]

Another possible reason for why participants dispreferred the asymmetric interpretation of a comitative may be a possibility that the word order observed when a comitative construction is interpreted as asymmetric is a derived word order. Thus, an asymmetric comitative construction not only involves an adjunction structure, but may also be a result of movement, as shown in (139). If movement places additional demands on the processing of sentences, this may be the reason why the participants needed more time to read asymmetric than symmetric comitatives.²²

²² I thank Prof. Dr. Özgür Aydın for this suggestion.

- (139) [Ayşe ile] ben _____ sinema-ya git-ti-m.

Ayşe.NOM with I cinema-DAT go-PAST-1SG
‘I went to the cinema with Ayşe.’

2.3.6.1.2. Singular Agreement Controller

The second research question was to reveal whether the properties of the singular agreement controller in the comitative construction make one of the two readings more likely.

Recall that the Turkish comitative construction may be utilized to express accompaniment, as indicated in (104), repeated here as (140). In (140), *ile* ‘with’ appears between two DPs [Ahmet *ile* ben ‘Ahmet-with I/Ahmet and me’]. However, the verb only agrees with the second DP *ben* ‘I’. It is an indication that the subject comitative construction is interpreted asymmetrically, as a prepositional phrase, with only the second DP, *the singular agreement controller*, controlling the agreement.

- (140) Ahmet ile *ben* sinema-ya git-ti-m. *Turkish*
Ahmet.NOM with I cinema-DAT go-PAST-1SG
‘I went to the cinema with Ahmet.’

When the singular agreement controller is investigated, only one of the singular agreement controllers: the second person *sen* ‘you’, illustrated in (141b), was processed slower than the others.

- (141) a) Kaptanla ben yelkenli teknede kalıyordum/ kalıyorduk
 with captain I sailboat.LOC stay.1SG/1PL.PROG.PAST
 uzun zaman önce.
 long time ago.
‘I was staying on a sailboat with the captain a long time ago.’
‘The captain and I were staying on a sailboat a long time ago.’

- b) Kaptan-la sen yelkenli tekne-de kalı-yor-dun-/nuz
 with captain you sailboat-LOC stay-PROG.PAST-2SG/ 2PL x
 uzun zaman önce.
 long time ago
 ‘You were staying on a sailboat with the captain a long time ago.’
 ‘You and the captain were staying on a sailboat a long time ago.’

For some reason, an asymmetrical comitative construction is hardest to process when the singular agreement controller is *sen* ‘you’. When it comes to person hierarchy, in the traditional account, it is believed that first person is followed by the second and the third person ($1^{st} > 2^{nd} > 3^{rd}$) (Filimonova, 2002). However, later a split between the $1^{st}/2^{nd}$ person and the 3^{rd} person has been suggested, and the 3^{rd} person is dominated by 1^{st} and 2^{nd} person ($1^{st}/2^{nd} > 3^{rd}$) (Filimonova, 2002; Silverstein, 1985). Thus, the person hierarchy cannot explain my results since it predicts that the processing of the comitative construction will be easier when the singular agreement controller is *sen* ‘you’ or *ben* ‘I’ compared to *o* ‘he/she’, contrary to fact.

Besides, my findings indicated that the comitative construction in which the second DP is 2^{nd} person singular *sen* ‘you’ is hardest to process in *both symmetrical and symmetrical interpretation*. This was unexpected because in the existing person hierarchy proposals, although the relationship between 1^{st} and 2^{nd} person is varied, 3^{rd} person is always dominated by both 1^{st} person and 2^{nd} person, so I would expect to see that the 3^{rd} person would be the hardest to process. However, the results were opposite. 1^{st} person and 3^{rd} person were processed at equal ease and 2^{nd} person was harder than both. I do not know what could be the motivation for this processing difficulty, but one avenue to explore is to consider both semantic and morphological factors. I can say that as 3^{rd} person is not marked on the verb, it may lessen its processing load and when it comes to the 1^{st} person, as Filimonova (2002) first suggested, it is higher in the hierarchy and so it is not surprising to see its easiness of processing. Also, the increased difficulty with which 2^{nd} person was processed in my experiment is entirely mysterious; at present, I do not have an adequate explanation for it. It could be worthwhile to examine the processing of *sen* ‘you’ in other subject-verb agreement

configurations (perhaps regular coordination) as well as non-agreeing constructions (e.g., subject relative clauses), to see whether the results I obtained are linked to agreement exclusively or to the properties of 2nd person singular outside of the agreement as well.

3.3.6.2. Conclusion

As this is the first study investigating the processing of Turkish comitative construction, there has been no literature to cite or to compare the results with. According to my experimental results, when symmetrical and asymmetrical interpretations of comitative construction are compared, the symmetrical interpretation is easier to process. The speakers tend to interpret the comitative construction as a coordination phrase. Secondly, when the singular element controller is investigated, it was observed that the second person (both with singular and plural agreement) is harder to process than others.

3.3.6.3. Limitations and Suggestions for Further Research

One of the methodological limitations of the present study was the lack of the participant analysis for the effect of the singular agreement controller on the reading times with different verbal agreement morphology. The analysis was not performed because of the inequality in the number of the items across the experimental lists. This caused an obstacle for the analysis by participant. In future research, I plan to equate the number of the items across the lists to be able to conduct a by-participant analysis. Moreover, the reason behind the absence of a significant difference between agreement patterns in the by item analysis may be the low power in the analysis. If the number of items is increased, this limitation will be eliminated, too.

In the future, we can conduct this study by controlling for the second languages that participants know. In particular, it would be interesting to see what would happen if we had a group of participants whose second language(s) admit(s) symmetrical

comitatives and a group of participants whose second language(s) do(es) not allow the symmetrical comitative.

Lastly, for further investigation, an acceptability judgment task may be prepared, and the acceptability rating of a comitative coordination may be determined. So, the result of this experiment can be supported.



CHAPTER 4

GENERAL DISCUSSION AND CONCLUSION

In this chapter, I summarize the findings from two experiments: the processing of Turkish comitative construction and the processing of numerally quantified subjects in Turkish. Then, I discuss the results and finalize the thesis with a general standpoint based on the findings of both experiments.

This thesis investigated the processing of agreement mismatches in Turkish. Previous literature has examined agreement mismatches that cause ungrammaticality; for example, in agreement attraction studies (Bock & Miller, 1991; Bock et al., 1999; Lago et al., 2015; Lago et al., 2019; Pearlmutter et al., 1999; Vigliocco et al., 1996, among others). What makes my experiments unique is the fact that the experimental items remained grammatical despite the existence of an agreement mismatch. This is true of both experiments: an agreement mismatch did not signal ungrammaticality, but rather, the existence of a different grammatical option in the choice of agreement morphology. In particular, the mismatch in subject-verb agreement was indicative of an internal syntactic structure of the subject, not necessarily obvious from the surface string. I examined which of the two grammatical agreement options will be preferred and what could be the motivation for this specific choice.

I investigated two specific cases in which verbal agreement morphology mismatched the subject: one, when the subject was numerally quantified and one when the subject was a comitative construction. In Turkish, numeral quantifiers typically require 3rd

person singular agreement morphology on the verb, or optionally, 3rd person plural agreement morphology. This is shown in (142).

- (142) Üç kişi gel-di-Ø/(ler).
three person come-PAST-3SG/3PL
'Three persons came.'

My hypothesis was that when a Turkish speaker encounters a numerally quantified subject, they expect to see one of these two agreement morphology options on the verb: 3SG or 3PL. This expectation was based on the fact that the string *iki kişi* 'two persons' most faithfully corresponds to the syntactic representation which is morphologically marked as 3SG (there is no plural marker), but is interpreted as 3PL. A subject-verb mismatch with such a numerally quantified subject occurs when the verb carries 1PL as in (143a) or 2PL, as shown in (143b).

- (143) a) Üç kişi gel-di-k.
three person come-PAST-1PL
'We came as a group of three.'
b) Üç kişi gel-di-niz.
three person come-PAST-2PL
'You came as a group of three.'

Such plural morphology on the verb suggests that the subject has a more elaborate syntactic structure, which contains the source of the 1st and 2nd person that is not obvious from the surface string. A possible structure, suggested by Göksel and Kerslake (2004) and Özyıldız (2017) is given in (144) and according to this analysis, the numerally quantified subject contains a converbial *olarak* 'being/as' with the PRO subject, controlled by a null, 1PL or 2PL *pro*, which is the true subject of the sentence. In this case, 1PL and 2PL agreement on the verb is the consequence of the verb agreeing with *pro*, rather than with the numeral quantifier.

- (144) a) Biz_i [PRO_i üç kişi ~~olarak~~] bu havuz-da yüz-üyor-du-k

- we three person this pool-LOC swim-PROG-PAST-1PL
daha geçen hafta.
just last week.
‘We were three people to swim in this pool just last week.’
- b) ~~Siz~~ [PRO_i üç kişi olarak] bu havuz-da yüz-üyor-du-nuz
you three person this pool-LOC swim-PROG-PAST-2PL
daha geçen hafta.
just last week.
‘You were three people to swim in this pool just last week.’

Given the close match between the surface string of quantified subjects (e.g., *iki kişi* ‘two persons’) and the syntactic representation of the subject that triggers 3rd person morphology on the verb, I expected speakers to find 1PL and 2PL agreement on the verb surprising. Accordingly, I expected the processing speed to decrease in such surprising conditions. However, I found that the participants did *not* show sensitivity towards the mismatch condition. In fact, they processed 1PL agreement morphology on the verb – an agreement mismatch – the fastest. This suggests that the structure of the phrase that participants initially posited for a numerally quantified subject is the one in (143a). This in turn suggests that Turkish speakers readily interpret phrases with relatively simple surface string as containing more underlying structure than meets the eye. This is further corroborated by the fact that I did not find a difference in the processing of 1PL and 2PL agreement between numerally quantified subjects and numeral pronouns, shown in (145a-b). Numeral pronouns contain overt indication of the person and number feature that trigger 1PL and 2PL agreement; in other words, they are not syntactically ambiguous. This absence of ambiguity was the reason why no processing difficulties were expected with numeral pronouns whatsoever.

- (145) a) Üçümüz geldik.
three of us come.PAST.1PL
‘Three of us came.’
- b) Üçünüz geldiniz.
three of you come.PAST.2PL

‘*Three of you came.’

My experimental findings can be explained in the following three ways:

- For some reason, apparently simple quantified phrases, like *iki kişi* ‘two persons’, can readily be given an elaborate, although not obvious underlying structure, which triggers 1PL and 2PL agreement;
- The structure of numerally quantified subjects when they trigger 1PL and 2PL agreement morphology is not as complicated as in (143) (Göksel and Kerslake, 2004; Özyıldız, 2017), but is complexity-wise closer to the transparent structure that triggers 3SG/3PL agreement;
- Alternatively, the structure of numerally quantified subjects when they trigger 3SG and 3PL agreement morphology is equally complex as the structure that triggers 1PL and 2PL agreement morphology; in other words, examples like (142) should also be given the analysis in (144), as shown in (146).

(146) ~~Önlar~~ [PRO_i üç kişi ~~olarak~~] bu havuz-da yüz-üyor-du-(lardı)
they three person this pool-LOC swim-PROG-PAST-3SG (3PL)
daha geçen hafta.
just last week.
‘They were three people to swim in this pool just last week.’

My second experiment investigated the agreement mismatch between the subject noun phrase containing the comitative construction and the verb. A comitative construction can be interpreted asymmetrically, in which case the two nouns in the comitative construction do not have equal rank in the event, or it can be interpreted symmetrically, in which case they do. In the asymmetrical reading, illustrated in (147a), the verb carries singular morphology, because agreement is controlled by a singular subject (*ben* ‘I’), modified by an adjunct PP (*Ayşe ile* ‘with Ayşe’). In the symmetrical reading, shown in (147b), the comitative is interpreted as coordination and the verb, agreeing with the entire coordinated phrase, carries plural morphology.

(147) a) Ayşe ile ben sinema-ya git-ti-m. [asym] Turkish

Ayşe.NOM with I cinema-DAT go-PAST.1SG

‘I went to the cinema with Ayşe.’

b) Ayşe ile ben sinema-ya gittik. [sym]

Ayşe.NOM with I cinema-DAT go-PAST-1PL

‘Ayşe and I went to the cinema.’

This thesis compared the processing of the two constructions in (146a-b) to find out which one is easier to process. Following the reasoning behind my expectations in Experiment I, I expected that the asymmetrical reading of the comitative construction (indicated by singular agreement) will be easier to process than the symmetrical one. Since Turkish possesses a “regular” coordinate construction, which employs the bona fide conjunction *ve* ‘and’, I expected that the lexical item *ile* ‘with’ will primarily be interpreted as a preposition (rather than as a coordinator), heading a PP that modifies the true singular subject (e.g., *ben* ‘I’ in (146a)). This analysis yields the asymmetrical reading of the comitative. This is why marking the verb with plural morphology was considered to be the *mismatch* condition.

The most striking result of this experiment is that in real-time processing, the mismatch condition (the symmetrical reading of the comitative, indicated by the plural agreement) was preferred compared to the match condition (the asymmetrical reading of the comitative, indicated by the singular agreement).²³ Assuming that the two readings of the comitative, symmetrical and asymmetrical, dovetail with different syntactic structures (Zhang, 2007) the results of my experiment show that the structure that underlies the symmetrical interpretation (where the two DPs are the complement and the specifier of a comitative head) is easier to process than the structure that underlies the asymmetrical interpretation (where the PP headed by the preposition *ile* ‘with’ is adjoined to the subject DP).

When the findings of the two experiments are compared, both indicated that the agreement mismatch, which does not cause ungrammaticality, does not lead to any

²³ I also found that none of the three possible singular agreement controllers (*ben* ‘I’, *sen* ‘you’, *o* ‘he/she/it’) is more likely to force the asymmetrical (or symmetrical) reading of the comitative than any other.

extra processing load or any increase in the reading time. By contrast, in both experiments, mismatches are actually preferred to match conditions, contrary to the findings of previous literature, which indicated speakers' sensitivity towards agreement mismatches (Bock & Miller, 1991; Bock et al., 1999; Lago et al., 2015; Lago et al., 2019; Pearlmutter et al., 1999; Vigliocco et al., 1996). However, since in the previous literature a mismatch entailed ungrammaticality, the fact that my findings, which tested mismatches as *grammatical* options, contrast with the previous literature is not that surprising. Nevertheless, my results do indicate that Turkish native speakers quickly and easily accommodate analyses of subject phrases that are not obvious given the surface representation (both when the subject is a numeral quantifier and when it is a comitative construction). It is possible that this is a peculiarity of Turkish, in which speakers quite commonly have to “fill in the blanks” due to, for example, pervasive argument drop (Özsoy, 1987; Taylan, 1986; Turan, 1998), but it is also possible that the reason for this lies in the nature of the particular constructions that I examined, namely, numeral quantifiers and the comitative construction. In order to further investigate these possibilities, more research is needed both in Turkish (comparing these constructions to other ambiguous phenomena) and in other languages (comparing the processing of different readings of numeral quantifiers and the comitative construction). I hope that this thesis not only shed some light on the processing of the two phenomena investigated here, but that its findings can also inform theoretical research of the syntactic make-up of numerally quantified phrases and the comitative construction.

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APPENDICES

A. FULL ITEM LIST OF THE EXPERIMENT I / DENEY I ÖGE LİSTESİ

Experimental Items
1. Üç kişi bu havuzda yüzüyordu daha geçen hafta.
2. Üç kişi bu havuzda yüzüyorlardı daha geçen hafta.
3. Üç kişi bu havuzda yüzüyordunuz daha geçen hafta.
4. Üç kişi bu havuzda yüzüyorduk daha geçen hafta.
5. Üçünüz bu havuzda yüzüyordunuz daha geçen hafta.
6. Üçümüz bu havuzda yüzüyorduk daha geçen hafta.
7. İki kişi bu sınıfta konuşuyordu daha geçen hafta.
8. İki kişi bu sınıfta konuşuyorlardı daha geçen hafta.
9. İki kişi bu sınıfta konuşuyordunuz daha geçen hafta.
10. İki kişi bu sınıfta konuşuyorduk daha geçen hafta.
11. İkiniz bu sınıfta konuşuyordunuz daha geçen hafta.
12. İkimiz bu sınıfta konuşuyorduk daha geçen hafta.
13. Dört kişi bu ormanda koşuyordu daha geçen hafta.
14. Dört kişi bu ormanda koşuyorlardı daha geçen hafta.
15. Dört kişi bu ormanda koşuyordunuz daha geçen hafta.
16. Dört kişi bu ormanda koşuyorduk daha geçen hafta.
17. Dördünüz bu ormanda koşuyordunuz daha geçen hafta.
18. Dördümüz bu ormanda koşuyorduk daha geçen hafta.
19. Üç kişi bu sokakta yürüyordu daha geçen hafta.
20. Üç kişi bu sokakta yürüyorlardı daha geçen hafta.
21. Üç kişi bu sokakta yürüyordunuz daha geçen hafta.
22. Üç kişi bu sokakta yürüyorduk daha geçen hafta.
23. Üçünüz bu sokakta yürüyordunuz daha geçen hafta.

24. Üçümüz kişi bu sokakta yürüyorduk daha geçen hafta.
25. Üç kişi bu sahada oynuyordu daha geçen hafta.
26. Üç kişi bu sahada oynuyorlardı daha geçen hafta.
27. Üç kişi bu sahada oynuyordunuz daha geçen hafta.
28. Üç kişi bu sahada oynuyorduk daha geçen hafta.
29. Üçünüz bu sahada oynuyordunuz daha geçen hafta.
30. Üçümüz kişi bu sahada oynuyorduk daha geçen hafta.
31. Dört kişi bu ofiste çalışıyordu daha geçen hafta.
32. Dört kişi bu ofiste çalışıyorlardı daha geçen hafta.
33. Dört kişi bu ofiste çalışıyordunuz daha geçen hafta.
34. Dört kişi bu ofiste çalışıyorduk daha geçen hafta.
35. Dördünüz bu ofiste çalışıyordunuz daha geçen hafta.
36. Dördümüz bu ofiste çalışıyorduk daha geçen hafta.
37. İki kişi bu odada uyuyordu daha geçen hafta.
38. İki kişi bu odada uyuyorlardı daha geçen hafta.
39. İki kişi bu odada uyuyordunuz geçen hafta.
40. İki kişi bu odada uyuyorduk geçen hafta.
41. İkiniz bu odada uyuyordunuz geçen hafta.
42. İkimiz bu odada uyuyorduk geçen hafta.
43. İki kişi bu mezarlıkta ağlıyordu daha geçen hafta.
44. İki kişi bu mezarlıkta ağlıyorlardı daha geçen hafta.
45. İki kişi bu mezarlıkta ağlıyordunuz daha geçen hafta.
46. İki kişi bu mezarlıkta ağlıyorduk daha geçen hafta.
47. İkiniz bu odada uyuyordunuz geçen hafta.
48. İkimiz bu odada uyuyorduk geçen hafta.

Comprehension Questions for Experimental Items		
1. Bu gölde yüzen üç kişi miydi?	Evet	Hayır
2. Bu sınıfta konuşan kaç kişiydi?	İki	Üç
3. Koşan dört kişi neredeydi?	Okul	Orman
4. Yürüyen iki kişi miydi?	Evet	Hayır
5. Sahada oynayan dört kişi miydi?	Evet	Hayır
6. Ofiste çalışan kaç kişiydi?	Dört	Üç
7. Uyuyan dört kişi neredeydi?	Ofiste	Odada

8. Ağlayan iki kişi mezarlıkta mıydı?	Evet	Hayır
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Filler Items
1. Genç adam bu evde oturuyordu üç ay önce.
2. Ünlü ressam sevdiği tabloyu inceliyordu son bir saattir.
3. Evli kadın güzel çiçekler yetiştiriyordu çok zaman önce.
4. Güzel kadın bu evde yaşıyordu çok daha önce.
5. Şu adam tozlu odada hapsiriyordu çok dün gece.
6. Diş hekimi yeni klinikte yoruluyordu çok son zamanlarda.
7. Ev hanımı yeni evini temizliyordu son bir haftadır.
8. Sinirli adam sert içki içiyordu çok geçen yıl.
9. Genç kız küçük kediye bakıyordu birkaç gün önce.
10. Deneyimli doktor felçli hastayla ilgileniyordu daha dün gece.
11. Çalışkan öğrenci zor soruyu çözüyordu son bir saattir.
12. Yaramaz çocuk parktaki trambolinde zıplıyordu üç gün önce.
13. Yeni müdür okuldaki işleri aksatıyordu son bir yıldır.
14. Kıdemli asker yeni erlere bağıriyordu çok son zamanlarda.
15. Karşı komşu üç çocuğunu büyütüyordu son yirmi senedir.
16. Yaşlı sanatçı son şarkısını söylüyordu üç saat önce.

Comprehension Questions for Filler Items		
1. Bu evde oturan kimdi?	Genç adam	Yaşlı adam
2. Tabloyu inceleyen ressam ünlü müydü?	Evet	Hayır
3. Güzel çiçekler yetiştiren kadın bekar mıydı?	Evet	Hayır
4. Bu evde yaşayan kadın güzel miydi?	Evet	Hayır
5. Hapşırان adam neredeydi?	Odada	Ofiste
6. Yeni klinikte yorulan kimdi?	Göz doktoru	Diş hekimi
7. Evini temizleyen kişi ev hanımı mıydı?	Evet	Hayır

8. İki ien adam sakin miydi?	Evet	Hayır
9. Kediye bakan kız gen miydi?	Evet	Hayır
10. Doktorun ilgilendiėi hasta felli miydi?	Evet	Hayır
11. Zor soruyu zen kimdi?	ğretmen	ğrenci
12. Zıplayan ocuk neredeydi?	Yatakta	Parkta
13. İřleri aksatan kimdi?	Mdr	İři
14. Yeni erlere baėıran kimdi?	Kıdemli asker	Komutan
15. ocuėunu byten kimdi?	Arkadař	Komřu
16. řarkı syleyen sanati gen miydi?	Evet	Hayır



**B. FULL ITEM LIST OF VERB FREQUENCY TEST / FİİL SIKLIK TESTİ
ÖGE LİSTESİ**

Experimental Items
1. yüzmek
2. konuşmak
3. koşmak
4. yürümek
5. oynamak
6. çalışmak
7. uyumak
8. ağlamak

Fillers
9. Imrenmek
10. Laflamak
11. Yudumlamak
12. Umursamak
13. Ürkemek
14. Tütmek
15. Hapşırarak
16. Savrulmak
17. Sömürmek
18. Incitmek
19. Kaynamak
20. Süpürmek
21. Haşlamak
22. Zıplamak
23. Tapmak
24. hıçkırmak

C. PARTICIPANT BACKGROUND QUESTIONNAIRE / KATILIMCI BİLGİ ANKETİ

Yaş:

Cinsiyet: ☐ Erkek ☐ Kadın

Anadiliniz nedir?: ☐ Türkçe ☐ Kürtçe ☐ Diğer ise lütfen belirtiniz:

.....

En son tamamladığınız eğitim dereceniz nedir? : ☐ İlköğretim ☐ Lise ☐ Önlisans

☐ Lisans ☐ Yüksek Lisans ☐ Doktora

D. CONSENT FORM / İZİN FORMU

Bu araştırma, ODTÜ Yabancı Diller Eğitimi Bölümü öğretim elemanlarından Prof. Dr. Martina Gračanin Yüksek danışmanlığında yüksek lisans öğrencisi Ayşe Gül Özay'ın yüksek lisans tez deneyidir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.

Çalışmanın Amacı Nedir?

Araştırmanın amacı, Türkçede yer alan cümlelerin nasıl işlendiğini göstermektir.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırmaya katılmayı kabul ederseniz, sizden beklenen bilgisayar ortamında hazırlanan anketi tamamlamanız. Bu çalışmaya katılım ortalama olarak 20 dakika sürmektedir.

Sizden Topladığımız Bilgileri Nasıl Kullanacağız?

Araştırmaya katılımınız tamamen gönüllülük temelinde olmalıdır. Ankette, sizden kimlik veya kurum belirleyici hiçbir bilgi istenmemektedir. Cevaplarınız tamamıyla gizli tutulacak, sadece araştırmacılar tarafından değerlendirilecektir. Katılımcılardan elde edilecek bilgiler toplu halde değerlendirilecek ve bilimsel yayımlarda kullanılacaktır. Sağladığınız veriler gönüllü katılım formlarında toplanan kimlik bilgileri ile eşleştirilmeyecektir.

Katılımınızla İlgili Bilmeniz Gerekenler

Anket, genel olarak kişisel rahatsızlık verecek sorular içermemektedir. Ancak, katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta serbestsiniz. Böyle bir durumda anketi uygulayan kişiye, anketi tamamlamadığınızı söylemek yeterli olacaktır.

Araştırmayla ilgili daha fazla bilgi almak isterseniz

Anket sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Bu çalışmaya katıldığınız için şimdiden teşekkür ederiz. Çalışma hakkında daha fazla bilgi almak için Ayşe Gül Özay (E-posta: ayse.ozay@metu.edu.tr) ile iletişim kurabilirsiniz.

Çalışmaya katılmayı kabul ediyorsanız aşağıdaki butona tıklayarak devam edebilirsiniz.

☐ Kabul ediyorum

E. FULL ITEM LIST OF EXPERIMENT II / DENEY II ÖGE LİSTESİ

Experimental Items
1. Benle sen karanlık sokaktan geçiyordun uzun zaman önce.
2. Benle sen karanlık sokaktan geçiyorduk uzun zaman önce.
3. Benle polis karanlık sokaktan geçiyordu uzun zaman önce.
4. Benle polis karanlık sokaktan geçiyorduk uzun zaman önce.
5. Benle sen lise yurdundan kaçıyordun uzun zaman önce.
6. Benle sen lise yurdundan kaçıyorduk uzun zaman önce.
7. Benle Emre lise yurdundan kaçıyordu uzun zaman önce.
8. Benle Emre lise yurdundan kaçıyorduk uzun zaman önce.
9. Senle ben resim sergisinde geziyordum uzun zaman önce.
10. Senle ben resim sergisinde geziyorduk uzun zaman önce.
11. Senle öğretmen resim sergisinde geziyordu uzun zaman önce.
12. Senle öğretmen resim sergisinde geziyordunuz uzun zaman önce.
13. Senle ben sıcak denize giriyordum uzun zaman önce.
14. Senle ben sıcak denize giriyorduk uzun zaman önce.
15. Senle çocuk sıcak denize giriyordu uzun zaman önce.
16. Senle çocuk sıcak denize giriyordunuz uzun zaman önce.
17. Kaptanla ben yelkenli teknede kalıyordum uzun zaman önce.
18. Kaptanla ben yelkenli teknede kalıyorduk uzun zaman önce.
19. Kaptanla sen yelkenli teknede kalıyordun uzun zaman önce.
20. Kaptanla sen yelkenli teknede kalıyordunuz uzun zaman önce.
21. Rehberle ben şehir gezisine çıkıyordum uzun zaman önce.
22. Rehberle ben şehir gezisine çıkıyorduk uzun zaman önce.
23. Rehberle sen şehir gezisine çıkıyordun uzun zaman önce.

24. Rehberle sen şehir gezisine çıkıyordunuz uzun zaman önce.

Comprehension Questions for Experimental Items

1. Sokak karanlık mıydı?	Evet	Hayır
2. Gezilen ne sergisiydi?	Mumya	Resim
3. Tekne yelkenli miydi?	Evet	Hayır
4. Kaçılan üniversite yurdu muydu?	Evet	Hayır
5. Deniz soğuk muydu?	Evet	Hayır
6. Rehber şehir gezisine çıktı mı?	Evet	Hayır

Filler Items

1. Benim annem nakış kursuna gidiyordu daha dün gece.
2. Yeni işçiler yığılmış kutuları düzenliyorlardı son bir haftadır.
3. Süslü kadın sütlü kahve içiyordu bir saat önce.
4. Hevesli öğretmen renkli kağıtları zımbalıyordu daha geçen gün.
5. Genç adam kıvrıcık saçlarını tarıyordu son bir saattir.
6. Enerjik genç çikolatalı şekerleri yutuyordu daha az önce.
7. Bilim insanı önemli deneyler gerçekleştiriyordu haftanın her günü.
8. Benim oğlum banyoda tıraş oluyordu iki gün önce.
9. Annemin halası ölüm döşeginde kıvranıyordu son bir senedir.
10. Erkek berberi çocuğun sakalını kesiyordu birkaç dakika önce.
11. Çirkin sekreter anlamsız notlar alıyordu birkaç saat önce.
12. Yaşlı kadın kötü dedikodular yapıyordu çok eskiden beri.

Comprehension Questions for Filler Items

1. Nakış kursuna giden kimdi?	Annem	Babam
2. Kutuları düzenleyen eski işçiler miydi?	Evet	Hayır
3. Kahve içen kadın süslü müydü?	Evet	Hayır
4. Kağıtları zımbalayan kimdi?	Asker	Öğretmen
5. Saçlar düz müydü?	Evet	Hayır

6. Şekerleri yutan genç enerjik miydi?	Evet	Hayır
7. Önemli deneyler yapan kimdi?	Hemşire	Bilim insanı
8. Tıraş olan kişi neredeydi?	Tuvalette	Banyoda
9. Son bir senedir kıvranan kimdi?	Annemin halası	Annemin teyzesi
10. Sakalı kesilen çocuk muydu?	Evet	Hayır
11. Notlar alan sekreter güzel miydi?	Evet	Hayır
12. Dedikodular yapan erkek miydi?	Evet	Hayır



F. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER



ORTA DOĞU TEKNİK ÜNİVERSİTESİ
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12 Aralık 2019Konu:

Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Prof.Dr. Martina GRACANİN

Danışmanlığını yaptığınız Ayşe Gül ÖZAY'ın "Mismatches in Subject-Verb Agreement" başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülmüş ve 488 ODTU 2019 protokol numarası ile onaylanmıştır.

Saygılarımızla bilgilerinize sunarız

Doç.Dr. Mine MISIRLISOY

Başkan

Prof. Dr. Tolga CAN

Üye

Doç.Dr. Pınar KAYGAN

Üye

Dr. Öğr. Üyesi Ali Emre TURGUT

Üye

Dr. Öğr. Üyesi Şerife SEVİNÇ

Üye

Dr. Öğr. Üyesi Müge GÜNDÜZ

Üye

Dr. Öğr. Üyesi Süreyya Özcan KABASAKAL

Üye

G. TURKISH SUMMARY / TRKE ZET

ZNE YKLEM UYUMUNDAKİ UYUMAZLIKLAR: İLEMLENME PERSPEKTİFİ

Genel Giri

Uyum (agreement), isimler ve sıfatlar arasındaki veya zne ve yklem arasındaki uyumu ifade eden veya belirleyen diller arasında gerekleen geni aplı bir olaydır (Chomsky, 2000). Uyumda iki ge yer alır: *sonda* (probe) ve *hedef* (goal). *Sonda* uyumun amacı roln stlenirken, hedef uyumun denetlendiđi gedir. *Biz geldik* cmlesinden yola ıkarsak, *geldik* bir *sonda* iken, *biz* ise *hedef*tir. Bu uyumda znenin uyum zellikleri, ykleme kopyalanır. Ancak bazı durumlarda bu kopyalama ilemi gereklemese bile bir uyum olayı gerekleir ve bu durum uyum uyumazlıđı olarak adlandırılır.

Uyum uyumazlıkları konusu daha nce literatrde geni yer edinmi ve pek ok aratırmacı tarafından alıılmıtır (Bock & Miller, 1991; Lago ve diđerleri, 2015; Lago ve diđerleri, 2019; Nicol ve diđerleri, 1997; Pearlmutter ve diđerleri, 1999, Wagers ve diđerleri, 2009). Bu uyumazlıklar genelde belirleyici (determiner) ve isim arasında oluan belirleyici bek zerinde gerekletirilmitir. Bock ve Miller (1991) bu konuda birok makalede kaynak gsterilen bir alıma yapmıtır. Bu alıma bir cmle tamamlama testi ile gereklemitir. Aratırmacıların rnekleri aađıda gsterildiđi gibi cmleciklerle balamıtır:

- (1) a) The key to the cabinets ...
‘Dolapların anahtarı ...’
- b) The keys to the cabinets ...
‘Dolapların anahtarları ...’

c) The key to the cabinet ...

‘Dolabın anahtarı ...’

d) The keys to the cabinet ...

‘Dolabın anahtarları ...’

Katılımcılar dilbilgisel hataları belirleyici ve isimler arasında uyum uyumsuzluğu olduğu durumda yapmışlardır ve bu çalışma katılımcıların uyum uyumsuzluklarına karşı olan hassasiyetlerini ortaya çıkarmıştır. İngilizcede yapılan çeşitli çalışmalara ek olarak Türkçede de buna benzer çalışmalar gerçekleştirilmiştir. Lago ve diğerleri (2019) uyum uyumsuzluklarını Türkçe ve Almanca tek dilli ve çift dilli konuşmacılar ile bir çalışma gerçekleştirdi. Bu çalışmada iki deney yapıldı. Bu tezin ilgilendiği deney olan ikinci deneyde katılımcılara bir anlama testi verildi. Bu çalışmada (2)’de yer alan cümleciklere yer verildi ve bazı cümleler dilbilgiselliğe uygun yüklem uyumu sağlanırken bazı öğelerde ise özne-yüklem uyumu dilbilgiselliğine aykırı cümleler verildi.

(2) a) Şarkıcının vokalisti ...

b) Şarkıcıların vokalisti ...

Katılımcılar tamlayan niteleyici çoğul olduğunda dilbilgiselliğe aykırı cümlelerin daha çok kabul etmiştir. Ancak baş isim ve takip eden niteleyici tekil olduğunda dilbilgisel olmayan cümleleri daha az kabul etmiştir. Bu da katılımcıların uyum uyumsuzluklarına olan hassaslığını göstermiştir.

Bu tezde ise uyum uyumsuzlukları özne ve yüklem arasında oluşmuş ve dilbilgiselliğe aykırı bir durum yaratmamıştır. Bu tezde işleme perspektifinden iki deney yapılmıştır. Birinci deneyde sayısal niceleyiciler (örn. *üç kişi*) özne konumundayken ikinci deneyde ise komitatif yapılar özne konumundadır. Bu iki farklı tür öznenin yüklemle arasında olan uyum uyumsuzluğunun ayrıntıları ve deneyler sonraki bölümlerde ayrıntılarıyla açıklanmıştır.

Deney 1

Giriş

Türkçede olan sayısal niceleyiciler literatürde sıfat olarak isimlendirilmektedir (Göksel & Kerslake, 2004; Kornfilt, 1997; Koşaner, 2006; Lewis, 1967; Özyıldız, 2007).

Türkçede sayısal niceleyicilerin ardından gelen isimler tekil olmak zorunda ve çoğul olduklarında dilbilgiselliğe aykırı düşen bir durum oluşur. Bu durum (3)'te gösterilmiştir.

- (3) a) üç kitap
b) *üç kitaplar

Sayısal niceleyicilerin yer aldığı özneler, yüklem üzerinde üçüncü tekil veya çoğul kişi uyumu gerektirmektedir ve bu yüzden üçüncü kişi eşleşme durumu olarak kabul edilmiştir (Göksel & Kerslake, 2004; Kornfilt, 1997).

- (4) Üç kişi geldi/geldiler.

Buna ek olarak sayısal niceleyiciler birinci ve ikinci çoğul kişi ile uyum sağlayabilmektedir ve bu durumda uyum uyumsuzluğu olarak kabul edilmiştir.

- (5) Üç kişi geldik/geldiniz.

Literatür, (5)'te yer alan cümlelerin altında yatan başka bir yapının olduğundan ve bu cümlede sessiz özne ve yüzeyde kaybolan bir *olarak*'ın varlığından bahsetmektedir. Bu yapı (6)'te gösterilmiştir.

- (6) a) Üç kişi bu havuzda yüzüyordunuz daha geçen hafta.
b) Siz_i [PRO_i üç kişi ~~olarak~~] bu havuzda yüzüyordunuz daha geçen hafta.

Buna ek olarak Türkçede, sayısal zamirler yer almaktadırlar. Bu sayısal zamirler üzerlerinde açık bir ek taşırlar ve bu ek herhangi bir uyum uyumsuzluğunun önüne geçer, anlam bulanıklığını engeller. Sayısal zamirlere örnek bir cümle (7)'de sunulmuştur.

- (7) a) Üçümüz parkta yürüdük/*yürüdü.
b) Üçünüz parkta yürüdünüz/*yürüdü.

Araştırma Soruları

Bu deneyde aşağıdaki araştırma soruları yer almaktadır:

- 1) Sayısal niceleyicilerin özne konumunda yer aldığı uyum uyumsuzluklarının (örneğin, özne = 3SG ve fiil = 1PL) işlemlenmesi, uyumsuzlukların olmamasından (özne = 3SG ve fiil = 3SG) daha mı zor?
- 2) Sayısal zamirlere sahip öznelerin işlemlenmesi (morfolojik ve anlamsal olarak belirsiz) sayısal niceleyici öznelerin işlemlenmesinden (anlamsal olarak belirsiz) önemli ölçüde farklı mıdır?

Çalışmanın Önemi

Bu çalışma, Türkçede yer alan sayısal niceleyici öznelerin kişi (ve sayı) uyum uyumsuzluklarını ilk kez işlemlenme perspektifinden incelemektedir. Ayrıca bu çalışma, sayısal niceleyici özneleri içeren cümlelerin işlenmesine yönelik içgörüler sağlamanın yanı sıra, Türkçedeki sayısal niceleyici cümlelerin altında yatan sözdizimsel yapıya ilişkin teorik önerilere de kaynak sağlayabilir.

Metot

Bu kısımda ilk deneyde yer alan katılımcılar, veri toplama aracı, yöntem ve veri analizi kısaca özetlenmiştir.

Katılımcılar

Bu çalışmaya 134 denek katılmıştır (97 Kadın). Deneklerin hepsi bir vakıf üniversitesinde hazırlık sınıfı öğrencileridir. Katılımcıların hepsinin ana dili Türkçedir ve yabancı dil olarak İngilizce öğrenmektedirler. Deneklerin İngilizce seviyesi A1 düzeyinde olanlardan seçilmiştir. Bunun sebebi Türkçe yorumlama yetisi üzerinde olası bir ikinci dil etkisini önlemektedir. Denekler en son bitirdikleri eğitim kurumu lisedir ve yaşları 18 ve 22 arasındadır.

Veri Toplama Araçları

Bu deney için 48 deneysel cümle hazırlanmıştır. Bu cümlelerin 36'sında sayısal niceleyiciler özne konumundayken 12'sinde sayısal zamirler özne konumundadır. Bu cümlelerle 6 liste oluşturulmuştur. Sayısal niceleyici özneler bir sayısal niceleyici ve *kişi* kelimesinden oluşmuştur. Özne, işaret zamiri *bu* ve bir dolaylı tümleç tarafından takip edilmiştir. Daha sonra cümlelerin kritik bölgesi yüklem yer almıştır. Yüklem zaman zarfı tarafından takip edilmiştir. Aşağıda deneyde yer alan 6 araştırma koşulunu bulabilirsiniz.

- | | | |
|------|--|--------------------|
| (8) | Üç kişi bu havuzda yüzüyordu daha geçen hafta. | Üçüncü tekil kişi |
| (9) | Üç kişi bu havuzda yüzüyorlardı daha geçen hafta. | Üçüncü çoğul kişi |
| (10) | Üç kişi bu havuzda yüzüyordunuz daha geçen hafta. | İkinci çoğul kişi |
| (11) | Üç kişi bu havuzda yüzüyorduk daha geçen hafta. | Birinci çoğul kişi |
| (12) | Üçünüz bu havuzda yüzüyordunuz daha geçen hafta. | İkinci çoğul kişi |
| (13) | Üçümüz bu havuzda yüzüyorduk daha geçen hafta. | Birinci çoğul kişi |

Cümleler toplamda yedi bölgeye bölünmüştür. Kritik bölgeler beşinci ve altıncı bölgelerdir. Dördüncü bölge yani fiil bölgesinin kritik bölge olarak kabul edilmemesinin sebebi bu bölgedeki kelimelerin cümleler arasında uzunluk bakımından farklı olmasıdır. Bu kelimelerdeki uzunluk farkının tepki süresinde bir etkisi olmaması için bu iki bölge kritik bölge seçilmiştir. Bölgeler aşağıdaki gibidir:

(14) R1 R2 R3 R4 R5 R6 R7
Üç kişi / bu / havuzda / yüzüyordu / daha / geçen / hafta.

Deneyde sekiz oldurgan fiil kullanılmıştır. Bu fillerin sıklık dereceleri bir test aracılığıyla denetlenmiştir ve bu test fiillerin sıklık bakımından fark etmediğini göstermiştir. Her cümle bir anlama sorusu tarafından takip edilmiştir. Bu soruların amacı deneklerin cümleleri dikkatli okuyup okumadığını ölçmektir. Ayrıca bu sorularda uyum ile ilgili herhangi bir ibareye yer verilmemiş ve sorudaki uyum tipinin katılımcıların deneysel cümleler hakkındaki yargılarını etkilemesinin önüne geçilmiştir.

Yöntem

Veriler Ibex Farm platformunda yürütülen Kendi-Hızıyla Okuma deneyi ile bir bilgisayar laboratuvarında toplanmıştır (Drummond, 2016). Katılımcılar 15'şerli gruplar halinde gelmiş olup araştırmacı deney boyunca öğrencilere eşlik etmiştir.

Veri Analizi

Verilerde öncelikle 100 ms'tan düşük değerler ve 3000 ms'ın üstündeki tepki süreleri kaldırılmış ve yerlerine ortalamalar yerleştirilmiştir. İkinci olarak uç değerler MAD yöntemiyle belirlenmiş ve bu değerler ortalama sürelerle değiştirilmiştir. Analiz için SPSS 26 kullanılarak tekrarlı ölçümler ANOVA kullanılmıştır.

Bulgular ve Tartışma

Bu çalışma iki araştırma sorusu üzerine yoğunlaşmaktadır. İlki sayısal niceleyicilerin özne olduğunu cümlelerle özne ve yüklem ilişkisi durumu (üçüncü tekil veya çoğul kişi) ve uyum uyumsuzlukları durumunun (birinci veya ikinci çoğul kişi) karşılaştırılmasıydı. Eşleşme durumunun diğer durumdan daha kolay bir şekilde

işlemlendiğini ve uyum uyumsuzluklarının altında yatan yapının (15) numaralı cümlede yer verildiği gibi olduğu tahmin edilmiştir.

(15) a) Üç kişi bu havuzda yüzüyordunuz daha geçen hafta.

b) Siz [PROi üç kişi olarak] bu havuzda yüzüyordunuz daha geçen hafta.

Bulgular göstermiştir ki kritik olmayan bölgelerin uyum tipi üzerinde herhangi bir etkisi bulunmamaktadır. İlk kritik bölge olan fiil bölgesinde beklenildiği gibi uyum tipinin etkisi görülmüş ve anlamlı bir fark ortaya çıkmıştır. Daha uzun bir fiile sahip olan ikinci çoğul kişi daha uzun sürede işlenmiştir. Ancak bu kritik bölge kelime uzunluklarında farklılıklardan dolayı kritik bölge olarak kabul edilmemiştir. Kritik bölgelerde ise uyum faktöründe anlamlı bir fark oluşmuştur. Bu farkın kaynağını bulmak için gerçekleştirilen analizler şaşırtıcı bir şekilde göstermişlerdir ki birinci çoğul kişi işlenmesi en kolay yapı olmuştur.

Bir diğer taraftan ikinci araştırma sorusu ise aynı uyum tipine sahip sayısal niceleyicilerin ve sayısal zamirlerin işlenme hızları arasında anlamlı bir farklılık bulunup bulunmadığının test edilmesi içindi. Bu soruda ise iki tip arasında tepki süreleri arasında anlamlı bir farklılık bulunması beklenmiştir. Çünkü sayısal zamirler, açık bir kişi eki taşımakta ve bu açık kişi ekini görmek katılımcılara uyum tipi hakkında bilgi vermektedir. Ancak sayısal niceleyicilerde ise özne üçüncü kişi olduğundan yüklem de üçüncü kişi olması beklenmekteydi. Bu yüzden birinci ve ikinci çoğul kişilerde işlenme yükü oluşmasını ve katılımcıların daha uzun sürede tepki göstermelerini beklemekteydim. Bu analiz göstermiştir ki yüklem üzerinde aynı uyum tipine (birinci ve ikinci tekil kişi) sahip sayısal zamirler ve sayısal niceleyiciler arasında anlamlı bir fark bulunmamıştır. Diğer deyişle *üç kişi geldik* ve *üçümüz geldik* yapıları arasında bir farklılık görülmemiştir. Bu bulgulara dayanarak birinci ve ikinci çoğul kişi arasında oluşan farkın kişi özelliğinin doğasından gelmediği ve bunun kaynağının özne olan sayısal niceleyici olduğu anlaşılmıştır.

Bu çalışmada benim uyum uyumsuzlukları diye isimlendirdiğim üçüncü kişi yapısı beklenildiği gibi kısa sürece işlenmemiş. Aksine birinci çoğul kişi diğer bütün

uyum tiplerinden daha kısa sürece işlemlenmiştir. Bu durum bize beklenenin aksine eşleşme durumunun daha az tercih edildiğini göstermiştir. Daha öncesinde de bahsedildiği gibi sayısal niceleyicilerin birinci ve ikinci çoğul kişi ile uyumunda cümlelerin daha karışık bir yapıya sahip olması sebep olarak gösterilmiştir. Ancak üçüncü kişinin de zor işlemlenmesinin sebebinin de sayısal niceleyicilerin üçüncü kişi içeren fiillerle eşleşmesinde de (15) numaralı cümlede olan bir yapının olabileceği öne sürülmüştür. Bu yapı (16)'da gösterilmiştir.

(16) a) Üç kişi bu havuzda yüzüyordu daha geçen hafta.

b) ~~Onlar~~ [PROi üç kişi olarak] bu havuz-da yüzüyordu(lardı) daha geçen hafta.

Çalışmada geliştirilebilecek noktalara değinecek olursak katılımcı sayısı ve test başına düşen cümle sayısı arttırılabilir. Dahası üçüncü kişinin, normal üçüncü kişi öznelerle işlemlenmesi de tekil ve çoğul kişi arasında nasıl bir fark oluşacağını saptamak açısından faydalı olacaktır. Ayrıca sayısal zamirler incelenirken üçüncü kişi sayısal zamiri *üçü* üzerinden çalışılmamıştır. Gelecekte yapılacak çalışmalarda sayısal zamir ve sayısal niceleyici olarak üçüncü kişi karşılaştırılabilir.

Deney 2

Giriş

Komitatif (comitative) terimi vasıta olma (instrumentality) ve eşlik etme ilişkilerini ifade etmek için kullanılan bir şemsiye terimdir (Haspelmath, 2004; McNally, 1993; Stassen, 2000; Stolz ve diğerleri, 2006). Komitatif yapının fonksiyonları aşağıda gösterildiği gibidir:

- (17) a) Eşlik: Aynı yüklem için iki katılımcısı aynı rolü oynar,
b) Vasıta olma: Bir katılımcı, başka bir katılımcının bir eylemi gerçekleştirmesini sağlayan araç görevi görür,
c) Kiplik: bir yüklem için zarfısal bir değişikliğe uğramasını sağlar.

(Stolz ve diğerleri, 2006)

Komitatif yapılar ikiye gruba ayrılmıştır: simetrik ve asimetrik yorum (Zhang, 2007). Asimetrik yorum ile başlayacak olursak, bu yapıda yer alan katılımcılardan biri asıl rolü üstlenirken diğer katılımcı birinci katılımcıya destek durumundadır (Göksel & Kerslake, 2004; Kornfilt, 1997). Sözdizimsel olarak bakıldığında ise *Ali'yle ben* komitatif yapısında *ben*, tekil uyum denetleyicisi olarak adlandırılmıştır. Çünkü *ben* kendi başına cümlelerin öznesi ve isim öbeğidir. Ayrıca tekil uyum denetleyicisi (18)'de gösterildiği gibi özne-yüklem uyumunu tek başına sağlayarak tekil uyum gerektirmektedir. *Ali'yle* kısmı ise ilgeç öbeği (prepositional phrase) olarak görev yapmaktadır. Dahası *ile* edatının ilk fonksiyonu bir ilgeç öbeği oluşturmak olduğundan bu yorum eşleşme durumu olarak kabul edilmiştir.

(18) Ahmet ile ben geçen hafta ödev yaptım.

Simetrik yapı ise bağlaç olarak ve kullanımına yakın bir anlama sahiptir. Eylemde yer alan iki katılımcı eşit role sahiptir. Uyum tipi, (19)'de de gösterildiği gibi iki katılımcının eşit yer almasından dolayı çoğul olmaktadır. Eşleşme durumu asimetrik yorum tarafından sağlandığından simetrik yapı uyum uyumsuzluğu olarak isimlendirilmiştir.

(19) Ahmet ile ben geçen hafta ödev yaptık.

Stassen (2000) dilleri *ile dilleri* 'and-languages' ve *ile dilleri* 'with-languages' olarak sınıflandırmıştır. *İle dillerinde*, komitatif yapıyı ve koordine anlamını vermek için aynı ifade kullanılmaktadır. Bir diğer deyişle aynı ifade hem simetrik hem asimetrik yorum sağlanırken kullanılır. Bunun bir örneği aşağıda gösterilmiştir:

(20) chin to boj hach Jacaltec (Mayan)
1.TKL go and/with 2.TKL
'Sen ve ben/senle ben gittim/gittik.'

Bir diğerk taraftan *ve dillerinde* ise komitatif anlamı ve koordine anlamını vermek için iki farklı ifade kullanılır. Bu tür dillerde simetrik ve asimetrik yapı da farklı ifadelerle kullanılır. Bu diller içinde İngilizce örnek verilebilir. İngilizce hem *and* ‘ve’ hem de *with* ‘ile’ yapılarına sahiptir. Bir örnek (21)’de gösterilmiştir.

- (21) a) Raaman-um Murukan-um vantaagka Tamil
Raman-ve Murugan-ve come.GEÇMİŞ.3ÇĞL
‘Raman ve Murugan geldiler.’ (Asher, 1982: 67)
b) naan appaa-kuute Cennekki pooreen
1TKL baba-ile Madras go.TKL
‘Babamla ben Madras’a gidiyorum’ (Asher, 1982: 112)

Bu iki net ayrıma ek olarak bazı *ve dillerinde* komitatif yapı çoğul uyumla da kullanılabilir. Bir diğerk deyişle Komitatif yapı hem simetrik hem asimetrik yorum yaparken kullanılır. Bu dillerin *ile dillerinden* farkı koordine yapısı için ayrı bir ifadeye sahip olmalarıdır. Bu dillerden biri de Türkçedir. Aşağıda yer alan (22) numaralı örnekte olduğu gibi Türkçe’de koordine anlamını sağlayan *ve* olmasına rağmen *ile* de koordine yapılarında kullanılır.

- (22) Ahmet ve ben geçen hafta ödev yaptık.
(23) a) Ahmet ile ben geçen hafta ödev yaptık.
b) Ahmet ile ben geçen hafta ödev yaptım.

Bu deneyde (23) numaralı örnekte yer alan iki cümle karşılaştırılmış ve aralarında işlemlenme bakımından herhangi bir fark olup olmayacağı test edilmiştir. Bir sonraki bölümde araştırma sorularına ayrıntılı bir biçimde yer verilmiştir.

Araştırma Soruları

- 1) Türkçede yer alan simetrik ve asimetrik komitatif yapılar nasıl işlemlenir; birinin işlemlenmesi diğerkinden daha mı kolaydır?

2) Tekil uyum denetleyicisinin özellikleri, komitatif yapının iki yorumundan birini daha olası kılıyor mu?

Çalışmanın Önemi

Bu çalışma Türkçedeki komitatif yapıları işleme bakış açısından inceleyen ilk çalışmadır. Bu yüzden deney boyunca alan yazında gösterecek bir kaynak bulunmamaktadır. Ayrıca Türkçe’de yer alan ile komitatif sağlayıcı kelime *ile*’nin koordine eden bir bağlaç mı olduğu sorusu hep belirsiz kalmıştır. Benim çalışmam bu sorunun geçerliliğini destekleyecek veya çürütecektir. Ayrıca bu deney tekil uyum denetleyicisinin bu iki yapı üzerindeki etkisini de deneysel açıdan inceleyecek ilk çalışma olacaktır.

Metot

Katılımcılar

Bu deneyde de Deney 1’e katılan denek grubu yer almıştır.

Veri Toplama Aracı

Bu deney için 24 deneysel cümle hazırlanmıştır ve bu cümleler dört listeye dağıtılmıştır. Deneysel cümleler bir komitatif yapı ile başlamış ve sıfat tarafından takip edilmiştir. Sıfatı bir dolaylı tümleç takip etmiş. Devamında cümlenin yüklemi yer almış ve cümle bir zaman zarfı ile sonlandırılmıştır. Deneysel cümle örnekleri aşağıda verilmiştir:

- (24) a) Benle sen karanlık sokaktan geçiyordun/geçiyorduk uzun zaman önce.
b) Benle polis karanlık sokaktan geçiyordu/geçiyorduk uzun zaman önce.
- (25) a) Senle ben resim sergisinde geziyordum/geziyorduk uzun zaman önce.
b) Senle öğretmen resim sergisinde geziyordu/geziyordunuz uzun zaman önce.
- (26) a) Kaptanla ben yelkenli teknede kalıyordum/kalıyorduk uzun zaman önce.

a) Kaptanla sen yelkenli teknede kalıyordun/kalıyordunuz uzun zaman önce.

Deneysel cümleler sekiz bölgeye ayrılmıştır. Bu bölgeler aşağıda (27)'de gösterilmiştir.

(27)	R1	R2	R3	R4	R5	R6	R7	R8
	Benle	/ polis	/ karanlık	/ sokaktan	/ geçiyorduk	/ uzun	/ zaman	/ önce.

Deney 1'de olduğu gibi bu deneyde de kritik bölgeler fiilin yer aldığı bölge 5 değil, bölge 6 ve 7'dir. Bunun nedeni fiilin yer aldığı bölgenin farklı uyum tiplerinde farklı uzunluklar göstermesidir. Bütün cümleler bir anlama sorusu ile devam etmiştir. Bu soru herhangi bir uyum ibaresi içermeyen soru cümlelerdir.

Yöntem

Veriler IbeX Farm platformunda yürütülen Kendi-Hızıyla Okuma deneyi ile bir bilgisayar laboratuvarında toplanmıştır (Drummond, 2016). Denekler birinci deneyi bitirdikten sonra 5 dakikalık bir ara vermiştir. Sonrasında Deney 2 ile devam etmişlerdir.

Veri Analizi

Verilerde öncelikle 100 milisaniyeden tan düşük değerler ve 3000 milisaniyenin üstündeki tepki süreleri kaldırılmış ve yerlerine ortalamalar yerleştirilmiştir. İkinci olarak uç değerler Lg10 yöntemi ile dönüştürülmüş ve 2,5 standart sapma ile belirlenmiştir. Daha sonrasında uç değerler ortalama ile yer değiştirmiştir. SPSS 26 kullanılarak tekrarlı ölçümler ANOVA ve eşleştirilmiş gruplar t-testi kullanılmıştır.

Bulgular ve Tartışma

İlk olarak asimetrik ve simetrik komitatif yapıları karşılaştırmak amacıyla bir eşleştirilmiş gruplar t-testi yapılmıştır. Bu testte beklediğim sonuç simetrik yapıların

(uyum uyumsuzluğu) asimetrik yapılara (eşleşme) göre daha yavaş işlemlenmesidir. Çünkü eşleşme durumu katılımcıların özneyi gördüklerinde karşılaşmayı bekledikleri yapı olacaktır. Ancak benim çalışmam tam tersini göstermiş ve eşleşme durumunun daha yavaş işlemlendiğini ortaya çıkarmıştır. Bir diğer deyişle katılımcılarımız *ile* yapısını bağlaç olarak görmeyi tercih etmiştir ve simetrik yapıyı daha hızlı işlemlendirmiştir. Türkçenin ve gibi bir bağlaca sahip olduğunu düşündüğümüzde *ile*'nin de bir bağlaç olarak kullanımının daha çok tercih edilmesi beklenmeyen bir durumdur.

İkinci olarak tekil uyum denetleyicisinin simetrik veya asimetrik yorumlardaki etkisi araştırılmıştır. Ve tekil uyum denetleyicisinin bu iki yorum üzerinde herhangi bir etkisi olduğu gözlemlenmemiştir. Ancak birinci, ikinci ve üçüncü kişi, tekil uyum denetleyicisi olarak karşılaştırıldığında ikinci çoğul kişinin iki yorumda da daha yavaş işlemlendiği ortaya çıkmıştır. Bu Filimonova'nın (2002) da ortaya sürdüğü kişi hiyerarşisine ters düşen bir durumdur ($1. > 2. > 3.$). Bu hiyerarşiye göre birinci kişinin daha kolay işlemlenmesi beklenirken, üçüncü kişi için herhangi bir açıklaması bulunmamaktadır.

Bu deney de eşleşme durumunun daha az tercih edildiğini göstermiştir. Simetrik yapı denekler tarafından daha kısa süre işlemlenmiştir. Bu sonuç bir önceki deneyde olduğu gibi beklenmeyen ve şaşırtıcı bir sonuçtur.

Bu çalışmanın metodolojik sınırlamalarından biri, tekil uyum denetleyicisinin farklı yüklem uyum morfolojilerinin tepki süreleri üzerindeki etkisine yönelik katılımcı analizinin olmamasıdır. Deney listelerinde oluşan öge sayısındaki eşitsizlik nedeniyle analiz yapılamadı. Gelecekteki araştırmalarda, katılımcılara göre bir analiz yapabilmek için listelerdeki öğelerin sayısını eşitlemeyi planlıyorum. Ayrıca, ögeye göre analizde uyum çeşitleri arasında önemli bir farklılığın olmamasının nedeni, analizdeki düşük güç olabilir. Öge sayısı artırılırsa, bu sınırlama da ortadan kalkacaktır.

Genel Tartışma

Bu tez Türkçede yer alan iki uyum uyumsuzluğu olayını işleme perspektifinden incelemiştir. Bu iki olayı diğer uyum uyumsuzluklarından farklı kılan şey bu uyumsuzlukların herhangi bir dilbilgisi kuralına aykırı olmamasıydı. İlk deney sayısal niceleyicilerden oluşan öznelerin (örneğin *üç kişi*), yüklem uyumunda üçüncü tekil ve çoğu kişi uyumu araması beklenmiş ve bu durum eşleşme durumu olarak adlandırılmış. Diğer olası iki kalıp ise birinci ve ikinci çoğul kişi olup bu kalıplar uyum uyumsuzluğu olarak adlandırılmıştır. İkinci deneyde ise özneler komitatif yapılardan oluşmuştur (örneğin *Ali'yle ben*). Komitatif öznelerin iki şekilde yorumlanabildiği görülmüştür. İlk yorum asimetrik olandır. Bu yorumda hareketin katılımcısı iki özne eşit rol oynamazlar ve birinin rolü diğerine göre daha baskın olur. Örneğin *Ali'yle ben* yapısında *ben* tekil uyum denetleyicisi olarak adlandırılmıştır ve asimetrik yorumda yüklem üzerine tekil uyum gerektirir. Bu yorum eşleşme durumu olarak isimlendirilmiştir. İkinci yorum olan simetrik yorumda ise iki katılımcı eşit rol üstlenir ve yüklem uyumu çoğul olur. Bu yorum da uyum uyumsuzluğu olarak adlandırıldı.

Bulgular gösterdi ki iki deneyde de eşleşme durumları daha az tercih edildi ve daha uzun sürede işlemlendi. Bir diğer deyişle denekler uyum uyumsuzluklarını eşleşme durumundan daha hızlı işlemlendi. Bu durum önceki literatür tarandığında şaşırtıcıdır. Çünkü önceki literatür bize eşleşme durumlarının eşleşme olmayan durumlara göre daha yavaş işlemlendiğini göstermiştir (Bock & Miller, 1991; Bock ve diğerleri, 1999; Lago ve diğerleri 2015; Lago ve diğerleri, 2019; Pearlmutter ve diğerleri, 1999; Vigliocco ve diğerleri, 1996).

Uyum uyumsuzluklarının altında yatan daha karışık yapılar olmasına rağmen Türkçe ana dil konuşucuları, yüzeysel olarak açıkça verilmeyen özne öbeklerinin analizlerine hızlı ve kolay bir şekilde uyum sağladı. Bu hızlı uyum sağlamanın nedeninin, *katılan düşümünün* (argument-drop) Türkçede yaygın olması ve bu yüzden konuşmacıların Türkçe'de oldukça sık “boşlukları doldurması” gerektiğinden kaynaklanıyor olabileceği öne sürülmüştür (Özsoy, 1988; Taylan, 1986; Turan, 1998).

Bu uyum uyumsuzlukları tercihinin (birden çok seçenek dilbilgisel olduđu zaman) incelediđim iki olaya özgü olup olmadığını keşfetmek için, gelecekte Türkçede yer alan ve dilbilgisi kuralına uyan diđer uyum uyumsuzlukları üzerinde çalışılmalıdır. Bu bize daha geniş bir genelleme yapma fırsatı verecektir.



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