Hacettepe University Graduate School of Social Sciences

Department of English Linguistics

English Linguistics Programme

PROCESSING OF OBJECT ORDERING IN TURKISH DITRANSITIVE CONSTRUCTIONS

Buse Şen Erdoğan

Ph.D. Dissertation

Ankara, 2026

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KABUL VE ONAY

Buse ŞEN ERDOĞAN tarafından hazırlanan “Processing of Object Ordering in Turkish Ditransitive Constructions” başlıklı bu çalışma, 25.06.2026 tarihinde yapılan savunma sınavı sonucunda başarılı bulunarak jürimiz tarafından doktora tezi olarak kabul edilmiştir.

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Yukarıdaki imzaların adı geçen öğretim üyelerine ait olduğunu onaylarım.

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Buse ŞEN ERDOĞAN

For my daughter, Rüya, who arrived in the middle of this journey and gave it a whole new meaning.

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ABSTRACT

ŞEN ERDOĞAN, Buse. *Processing of Object Ordering in Turkish Ditransitive Constructions*, Ankara, 2026.

This study aims to compare the processing of two object orders in Turkish ditransitive constructions based on several factors. In particular, it investigates how these object orders interact with the effects of givenness, syntactic complexity, and animacy of dative and accusative objects, and how these factors influence processing of ditransitivites. To this end, a self-paced reading experiment was employed. The participants of the study were 156 native Turkish speakers. Their reading times of the ditransitive sentences were measured as they read these sentences presented in a segmented, region-by-region format. Four experiments were conducted to reveal the effects of givenness, syntactic complexity and animacy of the object NPs. The results of the first experiment produced no significant difference in reading times between ACC>DAT and DAT>ACC object orders. Instead, a consistent first-object position advantage was observed, whereby the object appearing in the initial position was processed more easily regardless of its case marking. The second experiment examined the effect of givenness of the object NPs, demonstrating that given objects were processed more easily when they appeared in the first-object position. However, this effect was limited to the object regions and did not extend to overall sentence processing. The third experiment demonstrated that syntactic complexity modulated the first-object position advantage. Structurally longer and therefore more complex objects reduced this advantage when they appeared in the first-object position, and increased structural complexity of the first object made the overall sentence harder to process. In contrast to these factors, animacy of the objects did not show a systematic effect on processing. Overall, the findings suggest that sentence processing in Turkish ditransitive constructions is shaped by the interaction between object order and discourse-related factors such as givenness, as well as syntactic complexity. In contrast, animacy was found to have a more limited influence on processing. These results indicate that processing is influenced by both structural properties and distributional patterns in the language. Givenness and syntactic complexity, which appear to be more strongly represented in the distributional system than animacy, have a more consistent impact on processing. The absence of a clear advantage for a particular object order may be attributed to the flexible word order and rich case marking system of Turkish. In conclusion, sentence processing in Turkish ditransitive constructions can best be explained as the interaction between production-driven distributional patterns and real-time processing mechanisms.

Keywords

Turkish ditransitive structures, sentence processing, givenness, syntactic complexity, animacy, dative object, accusative object

ÖZET

ŞEN ERDOĞAN, Buse. *Türkçe'deki Çift Nesneli Yapılarda Nesne Sırası Değiştiriminin İşlemlenmesi*, Doktora Tezi, Ankara, 2026.

Bu çalışma, Türkçedeki çift nesneli yapılarda nesne sıralamasının işlemleme güçlüğünü çeşitli etmenler açısından karşılaştırmayı amaçlamaktadır. Çalışmada nesne sıralamasının, yönelme durumu ve belirtme durumu taşıyan nesnelerin yeni/eski bilgi ifade etmesi, sözdizimsel karmaşıklık ve canlılık özellikleriyle nasıl etkileşime girdiği ve bu etmenlerin işlemlemeyi nasıl etkilediği araştırılmıştır. Bu amaç doğrultusunda öz ilerlemeli okuma yöntemi kullanılmış ve anadili Türkçe olan 156 katılımcının, çift nesneli tümceleri bölümlere ayrılmış biçimde okurken okuma süreleri ölçülmüştür. Dört deney gerçekleştirilmiştir. İlk deneyin sonuçları, belirtme durumu > yönelme durumu ve yönelme durumu > belirtme durumu nesne sıralamaları arasında anlamlı bir işlemleme farkı olmadığını göstermiştir. Bununla birlikte, ilk sırada yer alan nesnenin, taşıdığı durum ekinden bağımsız olarak daha hızlı işlemlendiği gözlemlenmiştir. İkinci deney, nesnelerin yeni/eski bilgiyi ifade etme etkisini incelemiş ve eski bilgiyi ifade eden nesnelerin ilk nesne konumunda daha hızlı işlemlendiğini göstermiştir. Ancak bu etki yalnızca nesne bölgeleriyle sınırlı kalmış ve tümcelerin toplam işlemleme süresine yansımamıştır. Üçüncü deney, sözdizimsel karmaşıklığın ilk nesne konumu avantajını etkilediğini göstermiştir. Yapısal olarak daha uzun ve dolayısıyla daha karmaşık nesneler, ilk nesne konumunda yer aldıklarında bu avantaj azaltmıştır. Ayrıca, ilk nesnenin sözdizimsel olarak daha karmaşık olması tümcelerin işlemleme süresini artırmıştır. Bu iki etmenden farklı olarak, nesnelerin canlılık özelliğinin işlemleme üzerinde istatistiksel bir etkisi gözlemlenmemiştir. Genel olarak bulgular, Türkçedeki çift nesneli yapılarda tümce işlemenin tek bir faktör tarafından belirlenmediğini, nesne sıralaması ile söylem temelli bir etmen olan yeni/eski bilgi ifade etme durumu arasındaki etkileşimin ve sözdizimsel karmaşıklığın birlikte işlemlemeyi şekillendirdiğini göstermektedir. Buna karşın, canlılık etmeninin işlemleme üzerindeki etkisinin daha sınırlı olduğu bulunmuştur. Bu sonuçlar, çift nesneleri tümcelerin işlemesinin hem yapısal özelliklerden hem de dildeki dağılımsal örüntülerden etkilendiğini göstermektedir. Dağılımsal örüntülerde canlılığa kıyasla daha güçlü biçimde temsil edilen yeni/eski bilgi olma durumu ve sözdizimsel karmaşıklık, işlemleme üzerinde daha tutarlı etkiler göstermektedir. Belirli bir nesne sıralaması için açık bir işlemleme üstünlüğünün bulunmaması, Türkçenin esnek sözcük dizimi ve zengin durum eki sistemiyle açıklanabilir. Sonuç olarak, Türkçedeki çift nesneli yapılarda tümce işleme, üretim temelli dağılımsal örüntüler ile gerçek zamanlı işlemleme mekanizmalarının etkileşimi çerçevesinde en iyi şekilde açıklanabilir.

Anahtar Sözcükler

Türkçe çift nesneli yapılar, tümce işlemleme, eski/yeni bilgi, yapısal karmaşıklık, canlılık, belirtme durumu, yönelme durumu

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ABBREVIATIONS

1SG	First Person Singular
1PL	First Person Plural
2SG	Second Person Singular
3SG	Third Person Singular
3PL	Third Person Plural
ABL	Ablative
ACC	Accusative
BUF	Buffer Consonant
CAUS	Causative
DAT	Dative
DECL	Declarative
DEM	Demonstrative
DO	Direct Object
DOM	Differential Object Marking
ERP	Event-Related Potentials
EVID	Evidential
FUT	Future Tense
GEN	Genitive
HNPS	Heavy NP Shift

HORT	Hortative
IC	Immediate Constituent
INF	Infinitive
INS	Instrumental
IO	Indirect Object
IQR	Interquartile Range
L1	First Language
L2	Second Language
LMEM	Linear Mixed-Effects Model
LOC	Locative
NLP	Natural Language Processing
NOM	Nominative
NP	Noun Phrase
PASS	Passive
PART	Participle
PDC	Production-Distribution-Comprehension
PL	Plural
POSS	Possessive
PST	Past Tense
PROG	Progressive
REL	Relative Clause

RT	Reading Time
SOV	Subject-Object-Verb
SPR	Self-paced Reading
VP	Verb Phrase
WWW	World Wide Web

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INTRODUCTION

Human beings use their cognitive abilities in the process of interpretation of linguistic expressions. Chomsky (2002) proposes that people employ the same cognitive abilities even if their languages differ. This view leads to the idea that there is a universal grammar that is shared by all languages.

The process of interpretation and procession of linguistic structures is studied in psycholinguistics, which focuses on how language works in the human mind (Harley, 2013). This field deals with the mental processes that make it possible for people to comprehend and produce language, involving listening, reading, speaking, and writing. It also examines how language is acquired and how it relates to other cognitive abilities. In addition, it examines various linguistic constructions in different languages to understand the cognitive mechanisms behind these structures.

Psycholinguistic studies are mainly divided into the following three fields: language production, language comprehension and language development. In language comprehension, potential study topics include word processing and sentence processing. Papadopoulou (2006) argues that the aim of the studies on sentence processing is to understand the way people arrive at the intended meaning of a sentence. This component of psycholinguistics is known as the study of human language processor. There are various approaches concerning sentence processing. Most of these approaches assume that sentence processing is an incremental procedure (Altmann & Kamide, 1999). Specifically, this approach argues that when people encounter a new word or a linguistic construction, they continuously integrate this new information into their developing sentence analysis. During this analysis, they employ the process of parsing which refers to the syntactic analysis of a sentence. Through this process, they can comprehend the syntactic role of words and other constructions that they come across while listening or reading. This syntactic analysis requires semantic and pragmatic information to arrive at a possible and appropriate

meaning. It is still under discussion that whether syntactic and semantic/pragmatic analyses occur simultaneously or separately as distinct processes (Boland, 1997). In short, sentence processing deals with the structure of human parser, the universality of human parser, and the type of information people use to compute a syntactic analysis of a sentence. The last two topics are closely related to the aim of this study.

This study is a psycholinguistic analysis on the processing of ditransitive sentences in Turkish. As it is known, verbs have several categories. Major types of verbs are intransitives and transitives that produce distinct argument structures. For instance, intransitive sentences do not require a direct object (DO), whereas transitive sentences must have one. Both verb types have subtypes. Intransitive verbs are classified into unaccusatives and unergatives. There are two subtypes of transitive verbs: ditransitives and complex transitives. Of them, ditransitives are analyzed in the study in terms of their processing. Ditransitive verbs require two objects obligatorily: a direct object (DO) and an indirect object (IO). An example of Turkish ditransitive sentences is as follows:

(1) a. Çocuk şeker-i arkadaş-ı-na ver-di.[1]
Child.NOM candy-ACC friend-POSS-DAT give-PST.3SG
'The child gave the candy to her friend.'

b. Çocuk arkadaş-ı-na şeker-i ver-di.
Child.NOM friend-POSS-DAT candy-ACC give-PST.3SG
'The child gave her friend the candy.'

As can be seen in (1), the order of objects is flexible in ditransitive sentences in Turkish and in other languages. This flexibility of the object order is one of the reasons for extensive studies on the comprehension and production of these sentences. More specifically, these object phrases may appear in one of the following ways: (i) DO > IO as in (1a), and (ii) IO > DO as in (1b). Although Turkish ditransitive sentences like others in distinct languages are open to these object

[1] The Leipzig Glossing Rules are used whenever it is required.

orders, their processing difference has not been investigated in detail. There are only a limited number of experimental studies investigating this phenomenon such as Kahraman (2013), Kahraman et al. (2010), Kurt and Bakay (2021). Existing studies have analyzed these sentences without considering the effects of various factors such as syntactic complexity and givenness status of the objects on the order of DOs and Ios that are examined in the current study. In addition, these studies have not taken into consideration the potential effects of context on the processing of Turkish ditransitive constructions. Therefore, this study aims to provide more comprehensive analysis of these sentences focusing on the factors such as givenness, syntactic complexity/weight, and animacy on the processing of two object orders.

CHAPTER 1

BACKGROUND OF THE STUDY

This chapter presents the problem of the study, and the aims of the study along with the research questions. Then, it outlines the significance of the study and states its potential limitations. Lastly, it sets out the organization of the remaining sections of the study.

1.1. STATEMENT OF THE PROBLEM

The study of ditransitive structures in various languages is a topic of interest due to their flexibility regarding the object noun phrases (NPs). There are numerous psycholinguistic studies on ditransitive sentences. Some of these studies deal with their comprehension in English (Clifton & Frazier, 2004), Danish (Kizach & Balling, 2013) and Norwegian (Velnić & Anderssen, 2021). The production of ditransitive sentences is also examined in different languages like English (Arnold et al., 2000), Danish (Kizach, 2017), Russian and Ukranian (Mykhaylyk et al., 2013), Norwegian (Anderssen et al., 2014), French (Thuilier et al., 2021), German (Köhne et al., 2014), Korean (Yamashita & Chang, 2001), and Persian (Faghiri et al., 2014, Faghiri & Samvelian, 2020).

These studies demonstrate the effects of several factors on the comprehension, processing and production of these sentences. These factors include discourse givenness, syntactic complexity, animacy, definiteness and pronominalization. One of the goals of these studies is to understand whether these factors have congruous results in distinct languages.

Studies on Turkish ditransitive structures are relatively limited. Existing studies are generally theoretical and descriptive (Öztürk, 2005, 2006; J. Öztürk, 2008; Kornfilt, 2003). Some studies focus on the acquisition of these sentences (Sofu & Ertekin Sucak, 2018; Turhan, 2023). There is also one study that examines the focus position in these structures (Kurt & Dinçtopal Deniz, 2023). However, there are limited number of psycholinguistic studies investigating Turkish ditransitive sentences (Kahraman, 2013; Kahraman et al., 2010). One of these studies

examines the processing of ditransitive sentences by focusing primarily on the role of animacy in determining object order (Kahraman et al., 2010). The other one investigates the production of Turkish ditransitives (Kahraman, 2013). Animacy is one of the factors influencing sentence processing in many languages due to its relation to the thematic prominence and accessibility (Yamamoto, 1999). However, it is not the sole factor affecting the processing of ditransitive constructions. Instead, there are other factors that affect object order preferences and the processing of ditransitives. These factors have not been studied in relation to Turkish ditransitive sentences. One of these factors is givenness, which concerns whether a noun is already known or accessible in the present discourse context (Prince, 1981). It is reported that those objects that are given are processed more easily (Arnold et al., 2000). The other factor is syntactic complexity or weight, which is often associated with the relative length of linguistic constituents (Wasow, 1997). Regarding syntactic complexity, speakers tend to place shorter constituents before longer ones, while longer and heavier constituents are often postponed to later positions (Wasow, 1997; Bresnan et al., 2007).

Therefore, the current findings on the processing of Turkish ditransitive sentences are incomplete. A comprehensive investigation that focuses on the effects of givenness, syntactic complexity, and animacy on this topic is necessary to offer a more complete account of the factors shaping object order preferences and processing in Turkish ditransitive constructions.

1.2. AIM OF THE STUDY

This study aims to investigate the processing of the different object orders in Turkish ditransitive constructions focusing on the givenness, syntactic complexity, and animacy of the direct and indirect objects through self-paced reading experiments. Therefore, the goal is to examine whether there is a processing difference between given and new objects, less complex and more complex objects, and animate and inanimate objects in Turkish ditransitive sentences when presented in context.

1.3. RESEARCH QUESTIONS

Based on the aims given above, the following research questions guides the study:

1. How do object order variations (ACC>DAT or DAT>ACC) produce processing difference in Turkish ditransitive structures presented in context?
2. What are the effects of givenness of the object NPs on the processing of Turkish ditransitive structures presented in context?
3. What are the effects of syntactic complexity of the object NPs on the processing of Turkish ditransitive structures presented in context?
4. What are the effects of animacy of the object NPs on the processing of Turkish ditransitive structures presented in context?

1.4. LIMITATIONS OF THE STUDY

This study is testing processing and therefore, does not deal with the production of ditransitive structures although givenness as saliency, syntactic complexity and animacy are stated as active factors in sentence production too. To be able to offer insights on the universal features of human language mechanism, it would be better to carry out production studies and corpus studies related to ditransitive structures. Given that Turkish ditransitives are among the understudied topics, more studies are needed to have much more comprehensive understanding of their structural properties.

In addition, it only focuses on givenness, syntactic complexity and animacy factors while disregarding pronominalization and definiteness factors because of the feasibility of the current study. The other factors may be the topic of future research.

To present non-given dative and accusative objects, these objects are modified with Turkish indefinite marker *bir* ‘a/an’ in target sentences. In addition, to equalize the number of words in sentences, given objects are modified with the demonstrative pronoun *o* ‘that’. It may have reduced the naturalness of target sentences, but it is not possible to identify whether a dative object is given or non-

given without using *bir* ‘a/an’ before the noun. This situation results from the lack of a dedicated marker for definiteness and specificity for objects in Turkish, and the approach adopted here represents the most appropriate way of addressing this issue.

In addition, this study is conducted with university students which can be considered an educated and cognitively developed population in a society. Since this is a psycholinguistic study which aims to reach general conclusions about language processing, other populations should also be studied in future to offer broader views about the processing of Turkish ditransitive structures.

Lastly, the self-paced reading task is employed as the data collection tool. Although it is an effective tool used in many processing studies, it also has certain limitations. First, the linguistic stimuli are prepared and controlled by the researcher, which may reduce the naturalness of the data compared to authentic language use. Second, participants must press a button to reveal each segment of the sentence, so reading times may not exactly represent real-time processing. Other methods such as eye-tracking and event-related potentials (ERP) can provide more detailed information about online sentence processing. Therefore, future studies may benefit from using these methods together with self-paced reading.

1.5. SIGNIFICANCE OF THE STUDY

There is no study encountered so far which investigates givenness as saliency and syntactic complexity effect on the processing of Turkish ditransitive object order although these issues are studied in many languages. Psycholinguistic studies generally try to explain the universal features of the languages or cross-linguistic differences among languages in terms of comprehension, production, or acquisition so it is possible to say that this study will contribute to the literature in this regard about a language which has not been studied so far. At the end of this study, linguists can find some insights about the effects of givenness and syntactic complexity on the processing of Turkish ditransitives.

The animacy effect is investigated in Karaman et al.'s study (2010) related to the canonical ditransitive word order preference of Turkish native speakers. This study is different from it since it equalizes the animacy of the dative and accusative objects. This way we may see pure animacy effect on the processing.

Also, the changes in the object order of Turkish ditransitives can also help teachers of Turkish as a second or foreign language since they can take this information as a guide while teaching these constructions. Teachers of Turkish may arrange their curriculum design according to the results of this study about which factors are significant in ditransitive structure processing and they may start with the easier word order and move onto the harder one in their classes.

Finally, this study might be beneficial for the fields of education, communication, media etc. which use language to reach a group of audiences or readers. For example, if researchers who use Turkish as the language of their study pay attention to processing differences in structures related to word order, their target readers can comprehend the gist of the study easier. Similarly, writers, politicians, professionals working in marketing, creating web sites and applications might benefit from this study and they can promote their work better by using Turkish ditransitive structures and word order in general more effectively in the light of this and possible future studies.

1.6. OUTLINE OF THE STUDY

The remaining chapters of the study are organized as follows: Chapter 2 describes ditransitive structures in general and gives information related to the general structure of Turkish, focusing on word order and case marking and Turkish ditransitive constructions. Later, the factors influencing the processing of ditransitives such as givenness, syntactic complexity/weight and animacy are explained with related research on various languages. In addition, the studies on ditransitive structures in Turkish and other languages are also included in the literature review.

In Chapter 3, the methodology of the study is presented, including both the pilot experiment and the main experiments. This chapter provides information about the participants, research materials, data collection tool PsychoPy (Peirce et al., 2019), and the data collection procedure for each experiment seperately. It also presents the details of the data analysis for each experiment.

Chapter 4 includes the results and discussion of the study. The findings of the study are presented in line with the research questions. First, the results on the reading time of the object order variants are presented collapsing the following effects: givenness, syntactic complexity and animacy and discussions related to Experiment 1 is presented. Secondly, the results on the correlations between reading times and the givenness feature of the objects are given with relevant discussions. Next, the results on the connections between the reading times and the syntactic complexity of the objects are introduced and the discussion of the findings are presented. Lastly, the results on the effects of the animacy of the objects on the reading times are displayed with its discussions. Chapter 4 also includes the general discussion of the four experiments making references to the existing findings on the topic.

The last part concludes the study by answering the four research questions. It also covers the limitations and potential implications of the study. The study is concluded with the suggestions for future research and for some methodological points.

CHAPTER 2

LITERATURE REVIEW

This chapter provides an overview of the theoretical and empirical background relevant to the study. First, the key notion of language processing is introduced, with a particular focus on incremental sentence processing, which assumes that sentences are interpreted word by word as they unfold. This is followed by a discussion of different views on the central mechanisms involved in the comprehension of linguistic input. The Production-Distribution-Comprehension (PDC) Account is discussed in some detail, with particular attention to its predictions for processing preferences.

The following sections first introduce ditransitive constructions and their general structural properties across languages. Later, the structural properties of Turkish, including its word order flexibility and case marking system, are presented. This is followed by a discussion of Turkish ditransitive constructions and their object ordering patterns. Finally, linguistic factors that have been proposed to influence object ordering in ditransitive constructions are reviewed together with findings from previous studies. These factors include givenness, syntactic complexity, and animacy.

Finally, a broader overview of psycholinguistic research on ditransitives across languages is presented highlighting common patterns and questions in the literature. This includes studies on givenness, syntactic complexity, and animacy, as well as the limited number of psycholinguistic studies on Turkish ditransitive structures.

2.1. LANGUAGE PROCESSING

In sentence processing, there are mainly two distinct models that are proposed. One of them is an encapsulated model which assumes that language processing system is not unitary, but it is divided into distinct modules and for each module, human sentence processor has some domain-specific decision principles

(Trueswell & Tenenhaus, 1994). The other model is called interactive or constraint-based model, and it suggests that language processor benefits from information within and across domains and it does not appeal to domain-specific principles.

Two-stage models are categorized under encapsulated, that is, modular models. Syntactic-ambiguity resolution is the most studied topic to understand the structure of the processing mechanism. Related to how people resolve the syntactically ambiguous sentences, two-stage models such as garden-path model propose that human processor first employs only syntactic information and creates only one interpretation of that sentence. Later, the mechanism also employs other types of information such as semantic, phonetic, discoursal and so on and if the later interpretation contradicts with the first one, the initial structure is revised by the processor (Trueswell & Tenenhaus, 1994).

Unlike two-stage models, interactive or constraint-based models claim that human language processor employs different types of information at the same time based on the strength and relevancy of that information and at the end, an interpretation is accomplished based on the strongest constraints. In other words, syntactic, semantic, lexical, discoursal, phonological and other types of information all contribute to the interpretation of the sentence, and more than one interpretation is available at first but the one that satisfies more constraints wins and becomes the ultimate interpretation. The reason for the syntactic complexity is attributed to the conflicting cues.

While these models provide important insights into how sentence processing operates, they do not fully account for how language processing is shaped by all the components of the linguistic system. In particular, they tend to treat language comprehension, production, and acquisition as largely independent domains.

The studies of language acquisition, comprehension and production generally analyze the issues related to human cognitive system separately. Psycholinguists mostly assume that there are distinct language comprehension, production and acquisition processes which address the needs of listeners, speakers, and

learners respectively and most probably this is the reason why the studies of these areas are isolated from each other. MacDonald (1999) states that this separation causes some limitations in these areas and that is why she proposes an account which looks at language comprehension, production, and acquisition as interrelated processes. The main idea behind the account is that language comprehension is affected by the constraints that are proposed in language production research, and these constraints are acquired while children are acquiring the grammar of their language. This account is named as Production-Distribution-Comprehension (PDC) account, and is explained in later sections, since the present study also aims to understand how factors or constraints that are effective in language production influence the comprehension of Turkish ditransitive structures.

Before going into the details of the PDC account, it is also important to consider how sentence processing works, particularly in terms of incremental sentence processing, which provides a general mechanism underlying real-time language comprehension.

2.1.1. Incremental Sentence Processing

Incremental sentence processing can be defined as the continuous integration of linguistic information from the beginning in the sentence. In other words, comprehenders do not wait until the end of the sentence to construct the meaning; rather, they begin integrating each word into the developing structure as soon as it is encountered (Altmann & Kamide, 1999). As a result, the processor produces partial representations based on the incoming input by rapidly integrating multiple sources of information, including syntactic, semantic, and contextual cues (Trueswell & Tanenhaus, 1994). These representations are continuously updated as new words are encountered, and sentence interpretation evolves dynamically throughout the processing of the sentence.

Incremental sentence processing is based on predictions. The processor integrates the incoming word into the structure and predicts the rest of the structure based on what has been encountered so far. These predictions are

probabilistic and based on prior experience (Levy, 2008). Thus, the words at the beginning of the sentence are great indicators of the structure and they affect the structure stronger than the ones that come later due to incremental commitment. The human parser bases its predictions about the sentence to the earlier words in the sentence. Initial input strongly constrains interpretation. Verb is a very strong predictor of the structure especially in head initial languages where the verb is placed early in the sentence. Possible objects are anticipated based on the information provided by the verb (Altmann & Kamide, 1999). In head-final languages where the verb is generally at the end, other indicators such as the case markers on the nouns can fulfill this anticipatory job of the verb since case marking also provides predictive information similar to verbs. Thanks to this early commitment feature of the parser, processing gets faster although this may lead to temporary misinterpretations.

Incremental sentence processing is advantageous considering that it saves time by predicting the rest of the sentence, but it is also risky since it may cause reanalysis because of early and premature commitment to a structure. The coming input may not be compatible with the predicted structure, and this causes reanalysis of the existing structure. When reanalysis is required, the existing structure is revised or abandoned completely to arrive at a new and suitable structure. This situation increases the time spent for processing and causes extra effort. The need for reanalysis arises as a direct consequence of the predictive and incremental nature of the parser, which commits to an initial interpretation based on limited early input. Processing difficulty increases when a structure is revised. Garden-path model exemplifies this reanalysis mode effectively. The processor builds the structure based on the syntactic information provided by the earlier placed words in the sentence according to the model. However, when this structure does not reflect the reality provided by the rest of the sentence especially in ambiguous sentences, the parser goes back and rebuilds the structure again (Frazier & Rayner, 1982). This process is called garden-path, and it is a costly process for human cognitive mechanism since it requires extra time and cognitive effort by creating processing load. Trueswell and Tanenhaus (1994) argue that reanalysis is not always a necessity. Context may provide

valuable information and can build a structure which does not require reanalysis. Context can influence the structure from the onset of the sentence and moderate the effect of syntax. Alternatively, MacDonald (1994) proposes that processor builds multiple analyses rather than a single initial analysis based on various cues and these analyses compete. Coming information supports one of the alternatives at the end and that becomes the ultimate interpretation of the sentence.

Taken together, these approaches suggest that sentence processing can be described as a dynamic and incremental process in which multiple sources of information are integrated. Rather than relying solely on syntactic structure, the processor benefits from semantic, lexical, and contextual cues to build interpretation as the sentence continues. This integration of multiple constraints allows for efficient and flexible processing but also makes the system sensitive to the distributional properties of the input. As a result, processing preferences and difficulties are not only determined by structural factors, but also by the frequency and likelihood of particular constructions encountered in language use. This perspective highlights the importance of considering language processing in relation to broader patterns of language use, an idea that is further developed in the PDC account discussed in the following section.

2.1.2. Production-Distribution-Comprehension Account (PDC)

The PDC account states that language planning and memory limitations affect language production and consequently language comprehension too. It is not claimed that all the language comprehension difficulty can be attributed to the constraints of language production, but the study of these constraints related to both language production and comprehension can shed some light into the issues that are unresolved in isolated language production and language comprehension studies (MacDonald, 2013).

The first step in language production is language planning, and it starts before execution. The process of language production is claimed to be incremental which means that part of the language planning, execution and the rest of the

planning are linked together and work simultaneously. How much planning is done before the production is under the control of speaker's strategy. This incremental process which allows execution to start before the complete planning of the utterance is only possible when parts of the planning is able to catch up with the execution. Since planning an utterance requires the items in the sentence to be retrieved from the long-term memory, the production process is disturbed when there is a problem with this retrieval.

MacDonald (2013) suggests that there are three types of constraints or biases which facilitate the planning of an utterance by helping the retrieval of the items from the memory. These are named as easy first, plan reuse and reduce interference biases. These constraints are explained briefly below but the easy first bias is discussed in more detail since in this dissertation, the effects of animacy, givenness and syntactic complexity are being examined, and these are some aspects under the easy first constraint.

Easy first bias is a way to understand why some items are placed before the others in the sentence when word order flexibility is possible. Basically, it states that the items, whether words or phrases, that are easier to retrieve are the ones placed in earlier and to the more prominent positions in a sentence. Easier items are more accessible or more available in the memory, so incremental sentence production process starts with these easier words or phrases to allow more time for the harder ones while execution is ongoing. In this context, 'easy' or 'accessible' refers to the items that are either more frequent, or short in terms of words or syllables, or more salient in the context, or previously mentioned, or animate and so on. Bock (1982) also claims that these factors which affect the ease of retrieval from the long-term memory have an effect on the word order preferences in the sentence. These findings indicate that there is an interaction between lexical and syntactic processing. This easy first principle is not limited to language planning, but it also applies to motor and action planning which are also incremental and require subplans to be ordered in the correct way while the action is ongoing (MacDonald, 2013). PDC account defends the view that word order alternations are very valuable for language production research since they help

us understand how language producers change the order of words in a sentence to raise the fluency just like in action planning mechanism.

Plan reuse is again related to the speakers' choice of easy but this time the item that is easy is not the word or the phrase; it is the sentence structure. Just like in priming studies, the claim is that speakers prefer to use the sentence structure which they heard or read recently. For example, when they are exposed to the passive structure, they generally continue with the passive structure although active sentence structure is the basic one. The last bias is reduce interference, which is related to the memory limitations at the time of planning rather than bringing the information from long-term memory. It states that items which are connected semantically, phonologically or in other dimensions cause difficulty in planning and might result in late production or errors. To illustrate, using couch and chair in the same sentence close to one another raises the probability of production error. MacDonald (2013) points out that these three production biases shape sentence production. Consequently, speakers of a language produce sentences which follow these biases. PDC account goes a little bit further and claims that children's acquisition of that language is also affected by production biases and connects language production and language acquisition. Based on this view, children also have these production biases and that is why they acquire some structures easier than the others. At the end, this shapes language typology.

When it comes to the comprehension difficulties of some structures compared to the others, PDC account connects these difficulties to the distributional differences among structures. Since some structures are produced more in a language in connection with the language production biases stated earlier, those structures are encountered by the speakers of that language more often. PDC account states that comprehenders are sensitive to these frequency differences and that is why they comprehend the structures which are more available in that language easier than others. Thus, instead of explaining the comprehension difficulties with some universal syntactic principles, PDC account explains these difficulties with the same constraints in language production. In short, easy first,

plan reuse and reduce interference constraints affect the distribution of structures in a language and consequently, this influences the language comprehension.

In this study, the assertions of the PDC account are tested in relation to the easy first bias. Previous research has shown that various factors such as givenness, syntactic complexity, and animacy may influence the ordering of objects in ditransitive constructions (Bresnan et al., 2007). These factors are closely related to the notion of accessibility proposed within the PDC account and have been examined in both language production and language comprehension studies. However, before discussing these factors in detail, it is necessary to introduce ditransitive constructions and the structural properties of Turkish that are relevant to the present study.

2.2. DITRANSITIVE CONSTRUCTION

In ditransitive sentences, the verb requires two objects: one direct object (DO) and one indirect object (IO). While the DO typically bears the thematic role of theme, the IO may have a recipient, beneficiary, possessor or source role (Levin & Rappaport Hovav, 2005). Ditransitive structures are mostly associated with verbs of transfer such as *give*, *send*, *offer*, and *show*. These verbs describe a transfer event in which an entity is transferred from an agent to a recipient. For this reason, the semantic roles of theme and recipient are often taken as the prototypical roles in ditransitive constructions (Haspelmath, 2015). For example, in (2a) below, *a book* is the theme, which is the transferred object, whereas *the man* is the receiver of the book, namely the recipient.

Ditransitive constructions allow alternative object orders in many languages, as shown in the following examples from English (2), Korean (3) and Turkish (4):

(2) a. Mary gave a book to the man.
b. Mary gave the man the book.

(3) a. Sumi-ka ku-ai-tul-eykey chayk-ul cwu-ess-ta.
Sumi-NOM DEM-child-PL-DAT book-ACC give-PST-DECL*
'Sumi gave the children a book.'

b. Sumi-ka ku-chayk-ul ai-tul-eykey cwu-ess-ta.
Sumi-NOM DEM-book-ACC child-PL-DAT give-PST-DECL
'Sumi gave the book to the children.'

(Park, 2018: 2)

(4) a. Ayşe kitab-ı adam-a ver-di.
Ayşe.NOM book-ACC man-DAT give-PST.3SG
'Ayşe gave the book to the man.'

b. Ayşe adam-a kitab-ı ver-di.
Ayşe.NOM man-DAT book-ACC give-PST.3SG
'Ayşe gave the man the book.'

As illustrated above, ditransitive constructions are open to two different object orders. This phenomenon has been a topic of interest for many researchers considering that it provides a useful domain for investigating the interaction of syntactic, semantic, discourse-related, and processing factors. The following section is related to the structural properties of Turkish, particularly word order and case marking, which are directly related to the analysis of Turkish ditransitive constructions.

2.2.1. Structure of Turkish

Before going into the details of Turkish ditransitive structures, it is necessary to explain word order and case system of Turkish, which are highly related to the Turkish ditransitives. Turkish is one of the Altaic languages that is mostly spoken in the Republic of Turkey. Some of the most basic morphological and syntactic characteristics of Turkish are its head-final structure with relatively flexible Subject-Object-Verb (SOV) word order, its agglutinative nature allowing extensive suffixation, and its rich morphological system.

In Turkish, canonical order is SOV as can be seen in the sentences (5) and (6). On the other hand, it is possible to change the order of the constituents in the sentence depending on information status, stress, focus and topicality.

(5) SUBJECT OBJECT VERB
Ben kitab-ı oku-du-m.
I.NOM book-ACC read-PST-1SG
'I read the book.'

(6) SUBJECT OBJECT VERB
Anne-m dizi izli-yor.
mother-1SG.POSS.NOM TV.series watch-PROG.3SG
'My mother is watching a TV series.'

Göksel and Kerslake (2004) state the features of the Turkish canonical order as follows:

(i) The predicate is at the end.

(ii) The subject is at the beginning.

(iii) A non-case-marked direct object, or any indefinite constituent with the occasional exception of an animate subject, occurs immediately before the verb.

(iv) An oblique object is placed immediately before the verb.

(v) Modal adverbials occur either at the very beginning of the sentence, or after the subject.

(vi) Sentence stress falls on the constituent before the predicate in verbal and affirmative existential sentences, on the subject complement in affirmative linking sentences, on *değil* in negative linking sentences and on *yok* in negative existential sentences.

(Göksel & Kerslake, 2004: 337-338)

From the features indicated above points (i), (ii) and (iv) are very important for the aims of this study. In the first experiment, we are trying to explain what the canonical object order is in Turkish ditransitive structures. That is why the subject is placed at the beginning and the predicate is at the end and only the order of the objects is altered in the experimental sentences. Depending on the point (iv), Subject > DO > IO > VERB order is expected to be the canonical order in Turkish ditransitive structures, since oblique objects are stated to placed immediately

before the verb. In ditransitive structures, dative objects are oblique objects, and this makes ACC>DAT order canonical based on Göksel and Kerslake (2004). One of the aims of the study is to determine whether this order is indeed the default order in Turkish and that is why DO>IO and IO>DO are compared in this study while the places of the subject and verb remain constant.

Since Turkish is one of the scrambling languages, it is possible to have various orders depending on pragmatic and semantic conditions (Erguvanlı-Taylan, 1987). The sentence in (5) repeated as (7) below for convenience can be expressed with six different orders.

(7) a. Ben kitab-ı oku-du-m.
I.NOM book-ACC read-PST-1SG

b. Kitab-ı ben oku-du-m.
book-ACC I.NOM read-PST-1SG

c. Ben oku-du-m kitab-ı.
I.NOM read-PST-1SG book-ACC

d. Kitab-ı oku-du-m ben.
book-ACC read-PST-1SG I.NOM

e. Oku-du-m ben kitab-ı.
read-PST-1SG I.NOM book-ACC

f. Oku-du-m kitab-ı ben.
read-PST-1SG book-ACC I.NOM
'I read the book.'

As illustrated in (7), all these options are available. The preference of one word order over the others order largely depends on the context and discoursal-pragmatic requirements. For instance, Göksel and Kerslake (2004) argue that (7b) and (7c) are interchangeable and both emphasize the subject. (7e) and (7f) are about the action of reading taking place rather than the subject or object. (7b) and (7d) are also indicated as the alternatives which have close meanings.

Göksel and Kerslake (2004) state that there are three main reasons behind changing the order of constituents. These are called focusing, backgrounding and topicalization. Focusing can be described as the emphasis on a particular constituent in the sentence. Backgrounding is in a way de-emphasizing a constituent. Topicalization is making a constituent the center point in the sentence. These operations make the sentence a scrambled sentence in which constituents are placed in different places than their canonical positions. In the examples (7), the canonical order is (7a) and others are considered scrambled orders.

Word order in Turkish ditransitive constructions also allows scrambling, and the canonical order is still debated. While some researchers argue that ACC>DAT is the canonical or more frequent order (Kornfilt, 1997, 2003; Kural, 1992; Underhill, 1972; İşsever, 2006), others propose an underlying DAT>ACC order (Georgala, 2011) or suggest that object order varies depending on the semantic properties of the dative object (Öztürk, 2005, 2006).

Another important characteristic of Turkish relevant to ditransitive constructions is its case marking system. Turkish has five case suffixes (Göksel & Kerslake, 2004). This variability of Turkish case markers contributes to the relatively flexible word order in Turkish, including ditransitive sentences. Case markers in Turkish are exemplified in Table 2.1.

Table 2.1 Case Markers in Turkish

Name	**Marker**	**Example**
Accusative Case	*-(y)I*	*Ali elma-**yı** aldı.* 'Ali took the apple.'

Dative Case	*-(y)A*	*Annem Edirne'-**ye** gitti.* 'My mother went to Edirne.'
Locative Case	*-DA*	*Dün hastane-**de** kaldım.* 'Yesterday, I stayed in the hospital.'
Ablative Case	*-Dan*	*Üniversite-**den** arkadaşım gelecek.* 'My friend from college will come.'
Genitive Case	*-(n)In/-Im*	*Kız-**ın** eşi çok kibar.* 'The girl's spouse is very kind.'

Of these case markers, two are relevant for the object NPs in ditransitive sentences: accusative case and dative case. In other words, the objects of Turkish ditransitive sentences are marked with these cases. Of them, accusative case-marked objects function as a direct object and those marked with dative case function as an indirect object. In Turkish ditransitive structures, the theme is always marked with the accusative case, whereas the goal or the recipient is inflected with the dative case (Öztürk, 2005).

The accusative case is the only structural case in Turkish, specifying the direct object of the sentence. Göksel and Kerslake (2004) state that the direct object must be definite to be inflected with the accusative case.

(8) Bütün arkadaş-lar-ımız-ı çağır-alım.
all friend-PL-1PL.POSS-ACC invite-HORT.1PL
'Let's invite all our friends.'

(Göksel & Kerslake, 2004: 156)

Indefinite direct objects can be non-case-marked.

(9) Bu konu-da kitap(-lar) oku-muş.
this subject-LOC book(-PL) read-EVID.3SG
'It seems he has read books on this subject.'

(Göksel & Kerslake, 2004: 155)

There are different functions of dative case suffix that is described as one of the oblique cases. As can be seen in (10), dative case-marked constituents can act as adverbials, indicating recipient or beneficiary. Such objects may indicate destination or target, the price of something and purpose as in (11). These NPs can be oblique objects of some verbs such as *sevin-* 'be pleased (about)', *benze-* 'resemble', *inan-* 'believe' etc. as in (12). These dative case-marked NPs can also be the complements of certain bare postpositions and adjectives as shown in (13). Lastly, these constituents appear to be the cause of a causative structure as in (14). Some examples to these structures are given below:

(10) Aysel-e anahtar ver-di-m.
Aysel-DAT key give-PST-1SG
'I gave Aysel a key/keys.'

(11) [Sen-i gör-me]-y-e gel-di-m.
you-ACC see-INF-BUF-DAT come-PST-1SG
'I came to see you.'

(12) [Ayşe-nin gel-eceğ-in]-e sevin-di-k.
Ayşe-GEN come-FUT-3SG.POSS-DAT be.glad-PST-1PL
'We were glad that Ayşe would come.'

(13) Saat iki-ye kadar çalış-tı-k.
hour two-DAT until work-PST-1PL
'We worked until two o'clock.'

(14) Filiz bütün ev iş-ler-in-i
Filiz.NOM all house work-PL-3SG.POSS-ACC
koca-sı-na yap-tır-ıyor.
husband-3SG.POSS-DAT do-CAUS-PROG.3SG
'Filiz makes her husband do all the housework.'

(Göksel & Kerslake, 2004: 157-158)

Kornfilt (2003) argues that oblique cases like dative case is always overt in Turkish and oblique case-marked NPs such as *sinemaya* 'to the cinema' are ambiguous between specific or nonspecific interpretations. In addition, these objects can scramble to different positions in a sentence although the canonical place for the oblique objects is claimed to be preverbal.

There are other cases like locative, ablative, and genitive case in Turkish with different functions. Locative case indicates the location of something as shown in (15), whereas ablative case expresses separation or departure from somewhere as in (16). Genitive case, on the other hand, shows the possessor of something as illustrated in (17). These case markings are exemplified below:

(15) Anahtar yer-in-de değil.
key.NOM place-3SG.POSS-LOC not
'The key is not in its place.'

(16) Ali oda-dan çık-tı.
Ali.NOM room-ABL leave-PST.3SG
'Ali left the room.'

(17) Ayten-in iki kız kardeş-i var.
Ayten-GEN two girl sibling-3SG.POSS exist
'Ayten has two sisters.'

(Göksel & Kerslake, 2004: 158-160)

In this study, we are dealing with ditransitive constructions which require two types of objects. As stated above, in such sentences, direct object is inflected with the accusative case, and indirect object attaches the dative case.

2.2.2. Ditransitive Constructions in Turkish

Turkish is a scrambling language under certain conditions. It also allows different object orders in ditransitive constructions as exemplified in (18):

(18) a. Ali kitab-ı Ayşe-ye ver-di. (ACC>DAT)
Ali.NOM book-ACC Ayşe-DAT give-PST.3SG
'Ali gave the book to Ayşe.'

b. Ali Ayşe-ye kitab-ı ver-di. (DAT>ACC)
Ali.NOM Ayşe-DAT book-ACC give-PST.3SG
'Ali gave Ayşe the book.'

(Öztürk, 2006: 392)

Some scholars such as Kornfilt (1997, 2003), Kural (1992), and Underhill (1972) argue that the canonical order in Turkish is NOM>ACC>DAT. This order corresponds to a theme-before-recipient or DO>IO order, since the theme is typically realized as the accusative-marked direct object and the recipient as the dative-marked indirect object. Similarly, İşsever (2006) notes that the ACC>DAT order is more frequently used by native speakers of Turkish, although both object orders are generally judged to be acceptable.

Georgala (2011) notes that Turkish has often been treated as a counterexample to approaches assuming an underlying IO>DO order in double object constructions. However, she argues that Turkish is not a genuine counterexample and proposes that IO>DO is also the underlying order in Turkish. Georgala (2011) adds that the apparent preference for ACC>DAT can be derived through movement operations, and evidence from depictive stranding supports an underlying IO>DO configuration. Related examples are as follows:

(19) a. Orhan turist-e bira-yı$_i$ ılık$_i$ servis et-ti.
Orhan.NOM tourist-DAT beer-ACC lukewarm serve do-PST.3SG
'Orhan served the tourist the beer lukewarm.'

b. Orhan$_i$ turist-e bira-yı çıplak$_{i/*j}$ servis et-ti.
Orhan.NOM tourist.DAT beer.ACC naked serve do-PST.3SG
'Orhan served the tourist the beer naked.'

c. Arkadaş-lar-ımız$_i$ Münih'-ten yorgun$_i$ dön-dü.
friend-PL-POSS.1PL.NOM Munich.ABL tired return.PST.3PL
'Our friends came back from Munich tired.'

d. Bira$_i$ garson tarafından ılık$_i$ servis edildi.
beer.NOM waiter by lukewarm serve PASS-PST
'The beer was served lukewarm by the waiter.'

(Georgala, 2011: 111)

Examples in (19) above illustrate that while *lukewarm* can be associated with *beer* (accusative object), *naked* cannot be linked with *tourist* (dative object). It suggests that accusative object is structurally closer to the depictive, which supports the view that IO>DO is the base order in Turkish (Georgala, 2011). The unaccusative and passive movements in (19c) and (19d) respectively, exemplify how depictives stay in the position where they are predicated of DOs before the A movement. This position is lower and closer to the verb in Turkish.

Although Göksel and Kerslake (2004) mainly state that oblique objects like dative objects are placed after the direct objects marked with accusative case, they also point out that there is no certain position for two case-marked objects when they are both definite. The order of the objects can change according to the predictability of them. This suggests that Göksel and Kerslake (2004) relate object order in ditransitives to the information structure.

Öztürk (2005, 2006) offers another account on the canonical order of Turkish ditransitive constructions, which is based on a study conducted on Japanese

ditransitives by Miyagawa and Tsujioka (2004). She argues that there are two different positions for the goal in Turkish ditransitives. One is called high possessive goal and the other is low locative goal.

(20) high goal$_{Possessive}$ theme low goal$_{Locative}$

It is noted that high goal expressing a possessive relation is structurally higher than the theme, so it comes before the theme in the sentence. Related examples are presented in (21):

(21) a. Her adam-a$_i$ resm-i-ni$_{i/j}$ ver-di-m.
every man-DAT picture-3SG.POSS-ACC give-PST-1SG
'I gave every man his picture.'

b. Resm-i-ni$_{*i/j}$ her adam-a$_i$ ver-di-m.
picture-3SG.POSS-ACC every man-DAT give-PST-1SG
'I gave every man his picture.'

(Öztürk, 2006: 154)

However, when the goal is low, expressing a locative relation, theme precedes it in the neuter order.

(22) a. Resm-i$_i$ çerçeve-si-ne$_{i/j}$ koy-du-m.
picture-ACC frame-3SG.POSS-DAT put-PST-1SG
'I put the picture in its frame.'

b. Çerçeve-si-ne$_i$ resm-i$_{*i/j}$ koy-du-m.
frame-3SG.POSS-DAT picture-ACC put-PST-1SG
'I put the picture to his/*its frame.'

(Öztürk, 2006: 154-155)

As mentioned in Chapter 1, these studies are descriptive, focusing on identifying the canonical or underlying object order in Turkish ditransitive structures from a syntactic perspective.

There are also psycholinguistic studies which examine word order patterns of Turkish ditransitives such as Kahraman et al. (2010) and Kahraman (2013). Kahraman et al.'s self-paced reading study (2010) focuses on the processing of ditransitive word order while Kahraman (2013) studies production of ditransitive sentences. In both studies, results show that animacy status of the goal is the determiner of its thematic role and ultimately, the position of the dative object. Basically, animate dative objects have possessor interpretations. These objects are produced before accusative objects and processed faster in the first-object position. Inanimate dative objects, on the other hand, are the locative goals and follow an opposite pattern.

Ditransitive verbs are mainly associated with the verbs of transfer which require a theme realized as an accusative object and a recipient or benefactive realized as a dative object. However, this definition is relatively narrow. Turkish studies on ditransitives have adopted broader understanding of these constructions. For example, Öztürk (2005, 2006) distinguishes between two types of goals in Turkish double object constructions: high possessive goals and low locative goals, as discussed above. In this analysis, goals are not limited to animate recipients but may also include inanimate locative goals. Psycholinguistic studies on Turkish ditransitives also follow this broader understanding. For instance, Kahraman et al. (2010) and Kahraman (2013) include verbs of location and placement in their experiments and treat these structures as ditransitive constructions.

This broader understanding is also supported by J. Öztürk (2008), who argues that verbs taking both an accusative-marked and a dative-marked elements obligatorily can be classified as ditransitive verbs. Based on this view, the important criterion is not only whether the dative argument is a recipient in the strict sense, but whether the verb requires both an accusative and a dative argument as part of its argument structure. J. Öztürk (2008) explicitly includes verbs such as *at-* "throw", *bırak-* "leave", *sal-* "release", *sok-* "put into", *tak-* "attach", *ser-* "spread", *sapla-* "stick", and *ver-* "give" among Turkish ditransitive verbs. This is important for the present study because some of the experimental

sentences involve verbs of location or placement rather than only verbs of transfer. In the present study, the term ditransitive is used for constructions in which the verb requires two objects, one marked with accusative case and the other marked with dative case. Within this framework, both recipient/possessor goals and locative goals are included. The reason behind the preference of broader definition is related to the fact that one of the factors studied in the study is animacy, which requires inanimate objects and this can only be accounted with verbs of location. The experimental sentences are prepared in line with the assertions of Öztürk (2005, 2006), J. Öztürk (2008), Kahraman et al. (2010), and Kahraman (2013).

The studies reviewed above provide different accounts of the underlying order of Turkish ditransitive structures. While some researchers argue that ACC>DAT represents the canonical order, others propose DAT>ACC as the underlying order or suggest that both orders may be available depending on the semantic properties of the dative argument. Psycholinguistic studies further indicate that the interpretation and processing of Turkish ditransitives may vary according to the animacy and thematic role of the dative object. Taken together, these findings demonstrate that the nature of object ordering in Turkish ditransitive constructions remains an open question and requires further investigation.

2.3. LINGUISTIC FACTORS INFLUENCING DITRANSITIVE OBJECT ORDERING

As stated in Section 2.1.2, according to PDC account, speakers place easy constituents early in their utterances so that they can spare more time for planning of the rest of the sentence which might include harder words or segments. This tendency is referred to as the easy first bias. The question of what is easy in a sentence is discussed before (Bock, 1982, Bock & Warren, 1985, MacDonald, 2013) and some factors such as frequency, saliency, givenness, concreteness, animacy, syntactic or phonological complexity are identified based on previous studies. Now, the question is which of these factors is influential in the word order of ditransitive structures. Regarding this issue, various studies are conducted, and their proposed claims are summarized in this part.

This flexibility in the order of accusative and dative objects is often attributed to different factors. In general, the constructional approach and the lexical approach claim that the two variants have slightly different meanings (Goldberg, 1995; Gropen et al., 1991; Levin, 2006).

(23) ‘x causes y to have z’ (possessive) ⇒ NP V NP NP
(24) ‘x causes z to go to/be at y’ (allative) ⇒ NP V NP [to NP]

(Bresnan & Nikitina, 2009: 3)

Based on semantic approaches, some verbs in English, such as *to throw*, allow both possessive and allative meanings, whereas other verbs, such as *to lower*, permit only one of these meanings. Therefore, verbs that can express both meanings may participate in object alternation, as in (25a) and (25b), while others can occur only in one type of structure, as in (26a) and (26b).

(25) a. I threw the box to John.
b. I threw John the box.

(26) a. I lowered the box to John.
b. *I lowered John the box.

(Bresnan & Nikitina, 2009: 4)

Bresnan and Nikitina (2009) argue that this approach faces a problem, since both ditransitive orders can be used in repetition while expressing the same meaning. In such cases, the two structures are used to repeat the same concept, as illustrated in (27) below:

(27) “You don’t know how difficult it is to find something which will please everybody—especially the men.”
“Why not just give them cheques?’ I asked.
“You can’t give cheques to people. It would be insulting.”

(Bresnan & Nikitina, 2009: 5)

Furthermore, semantic approaches argue that verbs and constructions are associated with certain meanings and syntactic structures. For example, Levin (2006) distinguishes different subclasses of communication verbs, including verbs of instrument of communication and verbs of manner of speaking. While the former can occur in both Verb–Noun Phrase–Prepositional Phrase (V–NP–PP) and Verb–Noun Phrase–Noun Phrase (V–NP–NP) structures, as in (28a) and (28b), the latter are restricted to the V–NP–PP structure, as shown in (29a) and (29b).

Verbs of instrument of communication:

(28) a. Susan cabled/emailed/faxed/phones/telegraphed/… Rachel the news.
b. Susan cabled/emailed/faxed/phones/telegraphed/… the news to Rachel.

(Bresnan & Nikitina, 2009: 7)

Verbs of manner of speaking:

(29) a. *Susan whispered/yelled/mumbled/barked/muttered/… Rachel the news.
b. Susan whispered/yelled/mumbled/barked/muttered/… the news to Rachel.

(Bresnan & Nikitina, 2009: 7)

Bresnan and Nikitina (2009) provide counter examples to this generalization from the World Wide Web (WWW) as in (30) where a manner of speaking verb is used in V–NP–PP structure.

(30) Shooting the Urasian a surprised look, she muttered him a hurried apology as well before skirting down the hall.

(Bresnan & Nikitina, 2009: 7)

They propose that the semantics of verbs or constructions are not sufficient by themselves to explain this alternation, contrary to the claims of semantic approaches such as Levin (2006), Goldberg (1995), and Gropen et al. (1991).

The other approaches explaining this flexibility accept that these two variants have the same truth conditional meaning. Bresnan and Nikitina's research (2009) on English ditransitives is one of the studies which does not completely support the semantic explanation behind ditransitive object alternation based on the examples like (27) and (30) instead they look at the issue from an informational perspective.

Various linguistic and discourse-related factors are proposed to explain different syntactic orders of the objects in ditransitive constructions in previous studies (Arnold et al., 2000; Bresnan et al., 2007; Ozón, 2009; Prat-Sala & Branigan, 2000; Primus, 1998).

Bresnan et al. (2007) analyze English ditransitive structures which are taken from Switchboard collection of recorded telephone conversations related to fourteen variables that might influence the choice of ditransitive object order. They summarize the factors which are found effective in ditransitive object order with a model. Based on this model, a discourse given object, whether it is the DO or IO, comes before a non-given object. A pronoun object comes before an object which is not a pronoun. An animate object comes before an inanimate object. A definite object comes before an indefinite object. Lastly, when the dative object is shorter than the accusative object, it comes first but when it is longer, it comes later.

This model is called harmonic alignment with syntactic position and is reported as follows: (a) discourse given > non-given; (b) pronoun > nonpronoun; (c) animate > inanimate; (d) definite > indefinite; and (e) recipient shorter than theme > recipient longer than theme (Bresnan et al., 2007: 16). Interactions between these features in English ditransitive sentences are illustrated in the following examples:

(31) a. I gave the book to a man.
b. I gave a man the book.

(32) a. I gave the man some books.
b. I gave some books to the man.

(33) a. I gave him a book.
b. *I gave a book to him.

(34) a. I gave it to a man.
b. *I gave a man it.

(35) a. I sent a man a letter.
b. I sent a letter to a man.

(36) a. I sent the dog to the village.
b. *I sent the village the dog.

(37) a. I sent the man a letter.
b. I sent a letter to the man.

(38) a. I sent the letter to a man.
b. I sent a man the letter.

(39) a. I sent the man the letter which was written by my mother.
b. I sent the letter which was written by my mother to the man.

Examples (31) and (32) show the effect of givenness on the order of objects in ditransitives. Whether the dative object or the accusative object is given, it is placed before the non-given object. Pronominal objects are mostly placed before the non-pronominal objects as in (33a) and (34a), the other order is even considered ungrammatical in English as can be seen in (33b) and (34b). Animacy is another influential factor. Animate objects come before the inanimate ones like in (35a) and (36a). Examples (37a) and (38a) exemplify the definiteness effect where the definite object is located before the indefinite object. Lastly, shorter dative objects are generally placed right after the verb as in (39a) while the longer objects are placed near the end of the sentence. These findings of Bresnan et al.'s study (2007) are tested in various languages to understand their effects on

language production and comprehension and there are different results depending on the language.

In the following sections, the features of givenness, animacy and syntactic complexity/weight (relative length of the objects) are explained using previous findings on their effects from various languages because this study focuses on these three factors in Turkish ditransitive constructions.

2.3.1. Givenness

As mentioned in Sections 1.2 and 1.3, this study focuses on givenness effect on the comprehension of Turkish ditransitives. Therefore, in this section, givenness is discussed, with its various definitions. Givenness is related to the accessibility of the referent. The *Given-before-New* principle (Clark & Clark, 1977) mainly states that given information comes before the new information. This principle is proposed as an explanation for different linguistic phenomena including the object ordering in ditransitive constructions. Based on this principle, people place the given object before the new object, and they also comprehend the sentences with given object-new object linearization easier than new object-given object linearization.

Arnold et al. (2013) describe different approaches to information status as part of the linguistic system. Based on their classification, there are categorical approaches which divide information status into categories such as given-new, topic-focus, rheme-theme, proposition-focus and there are gradient representations of information status. In gradient representations, there is a scale of accessibility or saliency of the referents, so the referents are hierarchically ordered according to different factors such as givenness, syntactic prominence or recency. For example, an NP which is mentioned recently in the previous discourse is more prominent than another NP which is mentioned a while ago. Mainly, Ariel (1988, 1990, 2001) and Givón (1983) defend this type of representation. However, Arnold et al. (2000) state that categorical representation is very beneficial and adequate in experimental studies since it provides a simple coding technique. That is why this study employs a binary

categorical representation of information structure as given and non-given entities.

Instead of using the terms old and new, the terms given and non-given are used in this study since it is dealing with the referents which are mentioned or not mentioned in the previous context.

This given and non-given distinction in this study is mainly based on Prince (1981, 1992). Prince (1981) states that the customization of an utterance by a sender to the specific expected needs of the intended receiver seems to be the most important aspect. In other words, the way information is presented in natural language reflects the sender's theories about the preconceptions, ideas, and strategies of the recipient.

The given-new distinction is described as having various names in the literature, including old-new, presupposition-new, known-new, and so on. However, Prince (1981) argues that despite multiple attempts to explain this phenomenon, no one is able to agree on a precise definition of the terms because these scholars are focusing on different levels of givenness. That is why she divides givenness into three: givenness as predictability or recoverability ($Givenness_p$), givenness as saliency ($Givenness_s$) and givenness as shared knowledge ($Givenness_k$).

Givenness as recoverability or predictability is defined as follows:

> $Givenness_p$: The speaker assumes that the hearer can predict or could have predicted that as particular linguistic item will or would occur in a particular position within a sentence.
>
> (Prince, 1981: 226)

This type of givenness is associated with delectability from the sentence as in deleting the same subject when two sentences are conjoined. It is also associated with intonation as marked focus for new entities and unmarked focus for either given or new entities. In the following sentence, the pronoun *he* is considered given in terms of predictability because it can be deleted from the sentence.

(40) **John**$_i$ paid Mary and **he**$_i$**/ø** bought himself$_i$ a new coat.

(Prince, 1981: 226)

Givenness as saliency has a different definition which is provided below:

> Givenness$_s$: The speaker assumes that the hearer has or could appropriately have some particular thing/entity in his/her consciousness at the time of hearing the utterance.

(Prince, 1981: 228)

Prince (1981) argues that something must be mentioned in the previous context or should be in the physical context to be categorized as given in terms of saliency. Thus, definite and indefinite entities are both new as long as there is no prior context as in the examples (41) and (42) below:

(41) I saw **your father** yesterday.

(42) I saw **a two-headed man** yesterday.

(Prince, 1981: 229)

Also, even if an entity is inferable from the context, it is not categorized as given in terms of givenness as saliency like in the example (43):

(43) We got some picnic supplies out of the trunk. **The beer** was warm.

(Prince, 1981: 229)

The last type of givenness is called givenness as shared knowledge. It is defined as follows:

> Givenness$_k$: The speaker assumes that the hearer knows, assumes or can infer a particular thing (but is not necessarily thinking about it).

(Prince, 1981: 230)

In this type of givenness, it does not matter whether the speaker explicitly mentions of the entity or not as long as it is thought that the hearer knows or can infer what that entity is. Based on this view, proper names and possessives are considered given.

Prince (1981) notes that Kuno's (1979) From-Old-to-New Principle is closely related to the *Given-before-New* Principle proposed by Clark and Clark (1977) and Gundel (1988), which is based on Givenness_k. These approaches treat givenness as information that is shared between the speaker and the hearer. Therefore, given or old information does not necessarily have to be mentioned in the preceding discourse or be physically present in the context; it may simply be part of the common ground shared by the interlocutors. However, in this experiment it is not possible to have a shared knowledge between the reader and the experimenter, so Givenness_s is the indicator of givenness so given entities are the ones which are explicitly mentioned in the previous context and non-given entities are the ones that are not mentioned at all. However, Givenness_k is considered and tried to be avoided related to the accusative and dative objects in the experimental sentences so that it would not interfere with the results.

There is another broader distinction of given/old entities proposed by Prince (1992). Based on this view, discourse entities can be categorized as either old or new in terms of the hearer as in hearer-old/hearer-new entities. Also, they may be considered as discourse-old or discourse-new, depending on how they relate to the discourse. These two categorizations are partially dependent on one another because while a hearer-new entity must also be discourse-new, a discourse-new entity can be hearer-old.

According to the speaker's assumption, an entity is hearer-old if the speaker thinks the hearer knows the reference of it. The prior context does not need to refer to this entity. As an illustration, even if the reference is not mentioned in the preceding context, the speaker assumes that the listener is aware of who Eric Whitman is in (44). This R-expression in the sentence is regarded as hearer-old. However, in the latter sentence (45), someone must be hearer-new.

(44) I cannot come with you today because I will meet **Eric Whitman** in the afternoon.

(45) I cannot come with you today because I will meet **someone** in the afternoon.

An NP can either evoke an entity that has previously been stated in the prior discourse, or it can point to an entity which has not been addressed before. In the example above, *Eric Whitman* is a discourse-new entity even though it is considered as hearer-old. Therefore, we cannot determine an entity's hearer-status from discourse-newness. However, the fact that an entity is hearer-new would reveal something about its discourse-status since hearers are required to retain the information they have been given.

Discourse-old entities are the ones that are clearly expressed in the previous context. The example (46) below shows what kind of entities are considered as discourse old. The pronoun *him* is a discourse-old entity because it refers to *Eric Whitman* mentioned in the question.

(46) Speaker A: Why are you calling **Eric Whitman** constantly?
Speaker B: Because I am planning to meet **him** this afternoon.

Inferable entities are technically hearer-new (and, therefore, discourse-new), but, unlike hearer-new entities, their existence is assumed to be inferable by the hearer based on some trigger entity which is Discourse-old. An example to this type of entities is provided in (47) below. Even though NP *the door* is not explicitly stated in the previous sentence, the information about which door it is can be understood because the speaker states that he passed by a house and houses have doors, so it is most probably the door of that house.

(47) I walked by your house. The door was open.

The way Prince (1992) describes information structure has two benefits. First, it provides a simple coding technique that is beneficial for empirical studies. An NP is categorized as given if its referent has already been mentioned in the conversation. An NP is categorized as inferable if its referent could be inferred

from another NP in the discourse but has not been explicitly mentioned. NPs are only classified as new if their referents are completely novel to the discourse (Arnold et al., 2000).

In this study, previous context is provided by the researcher, and the researcher is only interested in given and non-given (new) entities not with inferable ones. That is why contexts are prepared in a way that either an entity is mentioned in the paragraph explicitly or is not mentioned and cannot be inferred from the context.

These theoretical distinctions regarding givenness and information structure also form the basis of many empirical studies on constituent ordering and sentence processing. Various psycholinguistic studies have investigated the effect of givenness on language production and comprehension. It is mostly observed that *Given-before-New* tendency exists in many languages, the strength of the effect may change across languages depending on specific structural preferences of the language.

Velnić (2018) publishes four articles based on her dissertation related to the roles of givenness and animacy in Croatian ditransitives. The results of her studies show some discrepancy. In one elicitation task, she states that adults do not show any sensitivity for givenness but in another elicitation task and in an acceptability judgement task, they do. Also, it is found that children's sensitivity to givenness is related to the use of referring expressions not to the object order.

A different study by Velnić and Anderssen (2021) investigates givenness and pronominality effect on Norwegian dative alternation. They employ a speeded acceptability judgement task and realize that both double object and prepositional object constructions are affected by givenness. In short, the given>new object order is processed faster in both structures. However, pronominality affects the two structures differently. Pronoun objects shorten reaction times in double object constructions, whereas they prolong reaction times in prepositional object constructions. Based on these findings, the researchers suggest that different processing biases influence the two alternates.

Choi's study (2009) on Korean is a corpus study, and it focuses on both givenness and heaviness of the objects which is the topic of Experiment 3 in this dissertation. Based on the corpus data, she finds that both factors are influential in Korean ditransitive object ordering and they compete during ditransitive production. When one effect is strong, the other is weakened. It is not possible to explain the preference of Korean ditransitive object order without considering both.

A study of Park (2018) which tests the *Given-before-New* principle with the L1 (first language) English adult L2 (second language) learners of Korean, reports that even though the speakers of both languages follow this principle in their mother tongue, English native speakers prefer the canonical IO>DO order in Korean even when this order does not follow the *Given-before-New* principle. She proposes that the tendency to use canonical word order might be overriding givenness considerations while learning a second language.

Kizach (2017) employs a memory recall experiment to understand whether definite>indefinite or indefinite>definite object ordered sentences are recalled correctly and produced orally more often in Danish. The results indicate that while Danish speakers change the definiteness of the objects more frequently with indefinite>definite order, they comply with the object order when it is definite>indefinite.

In Persian, relative givenness of the objects in ditransitives is found to be an important factor in production by Faghiri et al. (2014). They defend that givenness is only one factor which makes an entity conceptually accessible and propose that a conceptually more salient entity in a sentence is placed before less salient one by Persian speakers.

An Anatolian Turkic language under the influence of Russian is called Caucasian Urum. In a study conducted by Schröter (2021), the effect of givenness on the linearization of objects in ditransitive structures is tested and it is found that while givenness is effective both in Turkish and Russian ditransitive sentence

production, it is not in Caucasian Urum. The speakers of this language generally prefer IO>DO order by ignoring the givenness effect.

Another study by Mykhaylyk et al. (2013) investigates the production of Russian and Ukrainian ditransitive structures by children who are acquiring the language. It is found that children, unlike adults, tend to place the dative object before the accusative object regardless of whether one of these objects is given. This result is interpreted as an indication that children rely more on the underlying syntactic structure rather than on the *Given-before-New* principle.

Anderssen et al. (2014) study the acquisition of ditransitive alternation in Norwegian with respect to the givenness factor. They employ a semi-spontaneous production task in which 24 children and 10 adults describe a series of pictures designed to elicit ditransitive structures. The findings show that although children generally comply with the givenness constraint in their productions, they tend to omit the dative object in contexts where the accusative object is given, unlike adults. Similar to the findings of Mykhaylyk et al (2013), the authors argue that this pattern does not result from children's lack of awareness of pragmatic principles. Instead, they suggest that there is an asymmetry between dative objects and accusative objects. Children may be sensitive to this asymmetry and treat dative objects as more prominent than accusative objects. As a result, they may assume that dative objects are more likely to represent given information and therefore can be omitted. This explanation, rather than children's lack of pragmatic or syntactic knowledge of ditransitives, may account for the unexpected result.

By looking at different languages and different types of studies, we might conclude that givenness is generally an effective factor in the linearization of ditransitive objects. It should be mentioned that there are also some conflicting results in languages such as Norwegian (Anderssen et al., 2014), Russian and Ukranian (Mykhaylyk et al., 2013), Korean (Park, 2018), Caucasian Urum (Schröter, 2021) and Croatian (Velnić, 2018). However, these studies are mostly acquisition studies or they examine a contact language. Overall, previous studies

suggest that givenness may influence the ordering and processing of ditransitive objects across languages.

2.3.1.1. Givenness in Turkish

Givenness in Turkish is not realized as one specific form, rather there are different ways to express given entities. Word order, definiteness, topicalization and demonstrative pronouns can be used as the means of givenness in Turkish. It is suggested by Erguvanlı (1984) that given information or topic is generally placed in the sentence initial position. She also states that the topics are mostly realized as definite NPs in Turkish. Definiteness and referentiality are reported as some of the factors that constraint word order variation in Turkish (Erguvanlı-Taylan, 1987). When indefinite NP is placed in the topic position, the sentence becomes questionable or even ungrammatical considering that indefinite objects tend to occur in the immediately preverbal position in Turkish.

(48) ? Bir kitab-ı Murat aceleyle oku-yor.
a book-ACC Murat.NOM hurriedly read-PROG.3SG
'Murat is reading a book hurriedly.'

(Erguvanlı, 1984: 27)

As can be seen in example (48), sentence-initial placement of the indefinite NP is not accepted by some speakers, and this situation cannot be explained only through syntax; it also requires an explanation in relation to information structure. Since topics are generally associated with already identifiable or discourse-familiar entities, indefinite NPs are not equally acceptable in topic position. This suggests that Turkish word order is sensitive to the information status of NPs.

Göksel and Kerslake (2004) also discuss word order variation in relation to information structure. Similarly, İşsever (2003) argues that constituent order in Turkish is closely related to topic and focus organization. They state that focusing, topicalization and backgrounding are three procedures which may change the order of constituents in the sentence according to the information status. In this respect, an NP may be interpreted as given or topicalized through its position in

the sentence, or it may convey new or focused information by means of word order.

In Turkish, there is no specific definiteness article as in English *the.* On the other hand, there are various methods to express definiteness and specificity, which are other ways of making a NP given or non-given. Enç (1991) states that accusative case is generally used as a specificity marker. On the other hand, in her study related to specificity and differential object marking (DOM) in Turkish wh-phrases, Yarar (2018) points out that nonspecific entities tend to remain caseless as in (49):

(49) a. Ben kedi-yi gör-dü-m.
I.NOM cat-ACC see-PST-1SG
'I saw the cat.'

b. Ben kedi gör-dü-m.
I.NOM cat see-PST-1SG
'I saw a cat.'

(Yarar, 2018: 30)

Kornfilt (1997) and Göksel and Kerslake (2004) also discuss the relationship between case marking and the interpretation of DOs. This relationship is relevant to givenness, since discourse-given entities are generally identifiable, and tend to be expressed through definite or specific NPs. However, definiteness, specificity and givenness should not be treated as identical notions. An NP may be definite because it is identifiable through shared or general knowledge, even if it has not been explicitly mentioned in the previous discourse. For this reason, the present study does not rely only on definiteness in determining givenness.

Demonstratives can also be used for signaling givenness in Turkish. Expressions with the demonstrative determiner *bu* 'this' and *şu/o* 'that' generally refer to entities that are familiar or identifiable in the discourse, whereas expressions with the indefiniteness marker *bir* 'a/an' are often used while introducing new referents into discourse (Göksel & Kerslake, 2004). However, it is not possible to say that

an NP is given just by looking at demonstratives because the important factor is that the referent of the entity should be either mentioned in the previous discourse or known to the hearer in other way. In the example (50), the NP *o kadın* refers to an already introduced discourse entity, whereas *bir kadın* introduces a new referent into discourse.

(50) Dün ev-e güzel bir kadın gel-di.
yesterday house-DAT beautiful a woman.NOM come-PST.3SG
'Yesterday, a beautiful woman came home.'

a. O kadın anne-m-e yardım et-ti.
that woman.NOM mother-1SG.POSS-DAT help do-PST.3SG
'That woman helped my mother.'

b. Bir kadın anne-m-e yardım et-ti.
a woman.NOM mother-1SG.POSS-DAT help do-PST.3SG
'A woman helped my mother.'

The example (50a) shows that the referent of the NP is already accessible since it is mentioned in the previous discourse. On the other hand, (50b) examplifies a new referent and this referent is not mentioned before. In this study, givenness of the referents is established through explicit mention of the referents in the context before the experimental sentences. Givenness is taken as givenness as saliency based on Prince (1981). In addition, demonstrative pronoun *o* 'that' is used to strengthen the interpretation of givenness, whereas indefinite marker *bir* 'a/an' is preferred for non-givenness in addition to not being mentioned in the context. Inferable entities are not included into the dataset because the study aims to compare clearly given and non-given entities.

2.3.2. Syntactic Complexity/Weight

Another factor that is analyzed in Turkish ditransitive sentences is the syntactic complexity of the object NPs. There are different terms proposed for syntactic complexity in the literature such as cognitive complexity, structural complexity, clause complexity, linguistic complexity or grammatical/syntactic weight

(Szmrecsányi, 2004). However, all refer to sentences or phrases or words which are more complex cognitively. Consequently, the acquisition, comprehension and production of these entities are harder. Throughout this study, this concept is referred either as syntactic complexity or weight.

There are three different methods used to measure syntactic complexity in the literature. These are counting the constituent length like number of words, syllables, intonation units etc., counting the number of nodes dominated and counting the number of high complexity indicators dominated.

The first approach to the measure of complexity is the length of the items. Arnold et al. (2000) or Hawkins (1990) define syntactic complexity as the relative difference of items in length. Behaghel (1990) also implied that length is the measure of complexity when she proposed the end weight principle (as cited in Szmrecsányi, 2004). End weight principle can be described as saving the longer and ultimately more complex constituents near the end of a clause. However, Chomsky (1975) and Quirk et al. (1972) treat constituent complexity as distinct from mere constituent length (as cited in Wasow, 1997). Wasow and Arnold's study (2003) used a questionnaire and a corpus to reveal that both simple length and structure dependent complexity affect the constituent order in a sentence in a similar way.

Wasow (1997) points out another difference between the definitions proposed by Behaghel and Quirk et al. While the former focuses on the relative length difference between constituents, the latter deals with the complexity of a single constituent. However, Wasow (1997) supports the first definition and argues that the relative weight difference between constituents is the main determinant of word order in sentences.

As mentioned, the other way of measuring complexity is counting the nodes dominated. Depending on this method, if a constituent is dominated by more phrasal nodes than the other, it is considered more complex. Szmrecsányi (2004) points out that this is a more reliable method since it is supposedly based on

working principle of human parser. However, this method is very demanding compared to word counting since it requires manual coding of nodes.

The last way to calculate syntactic complexity is called an index of syntactic complexity by Szmrecsányi (2004) which is done by counting the high complexity indicators dominated. Based on this approach, the sentences which have subordinating conjunctions such as *because*, *since* etc., WH-pronouns like *who*, *whom*, *which* etc., finite and non-finite verb forms and noun phrases are more complex compared to the simple sentences and coordinated sentences. Furthermore, subordinators and WH-pronouns are claimed to make a sentence more complex compared to verb forms and noun phrases; their effect level is twice higher (Szmrecsányi, 2004). In other words, number of subordinators and WH-pronouns is multiplied by 2 when measuring index of syntactic complexity. As an example of these measures, the complexity of the following sentence is calculated below:

(51) The jury further said in term-end presentments that the City Executive Committee, which had over-all charge of the election, deserves the praise and thanks of the City of Atlanta for the manner in which the election was conducted.
Index of Syntactic Complexity: 21 (1 subordinating conjunction (x2), 2 WH-pronouns (x2), 5 verb forms, 10 NPs)
Sentence Length: 38 (38 words in the sentence)
Node Counting: 68

(Szmrecsányi, 2004: 1035)

Establishing that there are three different ways of measuring syntactic complexity/weight that are employed in various linguistic studies, the question is which one should be preferred. To find an answer, Szmrecsányi's study (2004) compares structural measures of syntactic complexity. He applies these measures of complexity to sentences from two different sources. One is a written and the other is a spoken corpus. The sentences which are taken from the two corpora are annotated syntactically by employing a phrase structure approach. He compares syntactic complexity of sentences based on above mentioned

different measures. At the end, it is found that counting nodes is conceptually and psychologically the most valid measure but counting words or index of syntactic complexity also give similar results as counting the dominated nodes. That is why Szmrecsányi (2004) concludes that any one of these measures can be used depending on their applicability to the relevant research, since they all yield approximate results.

Wasow (1997) also touches upon the same invariance among complexity measures. He also conducts a corpus study by focusing on heavy NP shift (HNPS), dative alternation and particle movement and compares complexity measures of word count, node count and phrasal node count. The results of the study indicate that all three measures are good at measuring syntactic weight/complexity of the constituents since they provide similar results, and they can explain the word order alternation in these constructions.

Beyond the measurement of syntactic complexity, another important issue is why constituent weight influences word order preferences across languages. There are different views proposed regarding the reasons of end weight principle. Some scholars believe that it is related to the parsing difficulty and looks at the issue from the listener's point of view. Others propose that the reason why speakers postpone harder constituents until the near end of a sentence is related to buy some time to construct these constituents. Hawkins's Early Immediate Constituents principle (1994) is the one which connects end weight principle and parsing needs of listeners. Based on this view, constituents tend to occur in particular orders in order to facilitate the rapid and efficient recognition and production of syntactic groupings and their immediate constituents (IC) during language processing. Different constituent orders may therefore lead to differences in the speed of immediate constituent recognition.

Based on this principle, the parser first attempts to identify the ICs within a verb phrase (VP). Processing becomes easier and more efficient when these ICs can be recognized earlier. Hawkins (1994) bases this principle on the word count and relative length of the ICs within the VP. He provides an example from a HNPS construction and argues that sentence in (53) is easier to comprehend than that

in (52). Hawkins (1994) argues that all ICs in (52) can only be identified after 11 words, whereas in sentence (53) these ICs can be identified after only 4 words. While counting these words, he does not include the full NP or PP occurring at the end of a sentence. This is because he assumes that as soon as the hearer encounters the preposition *to* in sentence (52) or the determiner *the* in sentence (53), the hearer figures out it is a ditransitive construction with either V - NP - PP or V - PP - NP order respectively.

(52) I $_{VP}$[gave $_{NP}$[the valuable book that was extremely difficult to find] $_{PP}$[to
1 2 3 4 5 6 7 8 9 10 11

Marry]]

(53) I $_{VP}$[gave $_{PP}$[to Mary] $_{NP}$[the valuable book that was extremely difficult to
1 2 3 4

find]].

(Hawkins, 1994: 57)

Hawkins (1994) mentions that a mirror-image effect is observed with head-final languages where mostly longer constituents come before shorter constituents. He explains this long-before-short order with his early immediate constituent account and says that in head-final languages like Japanese, the domain to recognize all the ICs of the verb is shorter when there is long-before-short order since the verb is at the end in these languages. The example (55) shows that the domain of IC recognition is longer when there is a short-before-long order, whereas it is shorter when there is a long-before-short order as in the example (54) in Turkish, a head-final language.

(54) Ben $_{VP}$[$_{NP}$[bulunması çok güç olan değerli kitabı] $_{PP}$[Ayşe'ye] verdim].
1 2 3

(55) Ben $_{VP}$[$_{PP}$[Ayşe'ye] $_{NP}$[bulunması çok güç olan değerli kitabı] verdim].
1 2 3 4 5 6 7

Unlike Hawkins, who mainly explains end weight through parsing efficiency, Wasow (1997) emphasizes speakers' production needs and utterance planning. In the study, the reasons behind end weight principle are also discussed. Since humans do not plan the whole utterance before speaking, he does not agree with the idea that parsing needs can solely explain this preference. He also points out that it is not really possible to count all the words or nodes or phrasal nodes in a sentence before starting the utterance so that the speaker can produce a sentence which is easily parsable for the listener. Instead, he claims that speakers' needs are also important and maybe even more important. They arrange their utterances in a way that they have more time to plan harder constituents. That is why utterance planning requires easier, less heavy constituents placed before the harder constituents and it happens that this order is mostly the easier one to parse for the listeners. Basically, Wasow's claim (1997) is that speaker's needs for the utterance planning are primary in word order and easing parsing in the meantime is a by-product of this. He concludes that although there are more to explain and discuss regarding end weight principle and weight effect, his findings show syntactic weight/complexity is an important factor affecting the order of constituents in sentence.

MacDonald's (2013) easy first principle, explained in the PDC section, is also consistent with Wasow (1997). MacDonald (2013) similarly argues that speakers tend to place easier constituents earlier in their utterances in order to gain more time to plan and produce more difficult constituents. She further claims that this tendency creates consistent distributional patterns in language and that human beings process frequently encountered structures more easily. Basically, she also suggests that processing advantage of short-before-long structures stems from their production advantage.

There are many studies which investigate the influence of syntactic complexity in different languages.

Wasow's corpus study (1997) finds that direct objects are generally more complex in double object constructions while indirect objects are more complex in prepositional object constructions in English. In short, both constructions show

a short-before-long tendency whether the complexity measure is number of words, nodes or phrasal nodes.

Arnold et al. (2000) also state that long constituents are mostly placed near the end of the sentence in English based on the findings of their study.

Russian also displays short-before-long order. Kizach's corpus study (2012) is another research which supports the view that longer or heavier constituents are placed after the shorter ones. In this study, four structures are analyzed, namely postverbal prepositional phrases, the double object construction, adversity impersonals, and the order of subject, verb, and object in simple sentences. In all four constructions, short-before-long order is more frequent than the reversed order.

Different than the previously cited languages, long-before-short tendency is observed in an online production experiment conducted by Yamashita and Chang (2001). There are two experiments in the study. The first one is focusing on transitive verbs with long or short subjects and direct objects, and the second one is studying ditransitive verb constructions with long or short direct and indirect objects. They find that native speakers of Japanese place the longer constituents before the short ones in both constructions. Unlike Hawkins (1994), they attribute the reason behind long-before-short order in Japanese to conceptual factors. They state that some languages such as English depend more on form while others such as Japanese depend on conceptual factors such as saliency. Since longer constituents are richer in terms of the lexical information they carry, they are conceptually more salient. For Japanese, this saliency is a more important factor than the complexity of the constituent and that is why longer constituents are placed before the shorter constituents in this type of languages unlike English. The difference between languages like Japanese and English is explained by the typological properties of these languages. Yamashita and Chang (2001) argues that in languages with strict word order, overt noun phrases, and verb-before-complement structures, constituent ordering is influenced more by syntactic structure than by conceptual factors. However, other languages which have rich morphological system with flexible word order and allow for null pronouns are

more influenced by conceptual factors. Also, speakers in head-final languages have greater flexibility in producing their utterances, as long as the intended meaning is preserved. Since verbs are placed at the end of the sentence, they do not constrain their complements from the beginning of the utterance.

In Choi's corpus study (2009), it is also found that in Korean, long-before-short order is preferred more often than short-before-long order. In the discussion part, they argue for three different reasons why this long-first tendency is observed in head-final languages. Two of them are related to Hawkin's Immediate Constituency account (1994) and Yamashita and Chang's conceptual saliency account (2001).

A third explanation discussed by Choi (2009) is that longer or heavier constituents tend to occur at the beginnings or ends of the sentence rather than in medial positions (Dryer, 1980 as cited in Choi, 2009; Wasow, 1997). When long constituents are placed in the middle, processing becomes more difficult, so speakers either place these constituents at the end or at the beginning of the sentence. Since SOV languages cannot easily place the long constituents at the end because of their head-final structure, they tend to prefer long-before-short order.

Similar findings are also reported for Persian, another SOV language with flexible word order. Faghiri and Samvelian (2014) investigate the language in terms of whether it displays long-before-short order or short-before-long order via a corpus study. Their findings support mirror-image effect where longer constituents are placed before the shorter ones. Furthermore, they find that the order of DO and IO in Persian also depends on the degree of determination of the DO. They also investigate the tendency of long-before-short constituent order in Persian with an experimental study (Faghiri et al., 2014). Their study reveals that although in ditransitive constructions with indefinite or bare-modified DOs, the relative length difference is an important factor for the order of objects, in other structures with marked and indefinite DOs, weight difference is not a viable factor. They believe the reason behind this diversification between structures is related to the conceptual accessibility of the constituents. Discourse givenness and lexical

richness are also considered as important factors which inhibit the effect of syntactic complexity in Persian.

All in all, syntactic complexity or weight is one of the important factors which affects the order of DOs and IOs in various languages but whether that language prefers short-before-long or long-before-short order depends on the typological features of the language.

2.3.2.1. Syntactic Complexity in Turkish

Structural complexity of NPs in Turkish increases by means of modification and embedding. Adjectives, determiners, adverbials, genitive constructions, postpositional phrases and relative clauses are some of the structures which make a noun phrase more complex (Göksel & Kerslake, 2004; Kornfilt, 1997). Coordination and additional phrasal materials may also increase the structural complexity of NPs. Although Turkish predominantly employs prenominal modification, certain postnominal modifying constructions are also possible such as *ki*-constructions (Kornfilt, 1997; Göksel & Kerslake, 2004). However, such constructions are considerably less frequent and more marked than prenominal modifiers. Examples of various types of premodifiers (from (56) to (62)) and postmodifier (Example (63)) in Turkish are given below.

(56) güzel çocuk
beautiful child
'beautiful child'

(57) çok güzel çocuk
very beautiful child
'very beautiful boy'

(58) her çocuk
every child
'every child'

(59) kadın-ın çocuğ-u
woman-GEN child-3SG.POSS
'the woman's child'

(60) masa-nın alt-ın-da-ki çocuk
table-GEN under-3SG.POSS-LOC-REL child
'the child under the table'

(61) okul-a gid-en çocuk
school-DAT go-PART child
'the child going to school'

(62) yaşlı ve yorgun çocuk
old and tired child
'the old and tired child'

(63) o çocuk ki dün gel-di.
that child KI yesterday come-PST.3SG
'the child who came yesterday'

The noun *çocuk* 'child' is the simplest form and the noun phrase gets longer and heavier with the help of the modifiers above.

In the present study, syntactic complexity is operationalized mainly through word count rather than node count or high complexity indicator count. Adjectival modifiers, coordinated structures, and phrase-level modifiers were employed to make one object more complex than the other. Relative clauses are not included because they constitute subordinate clauses, and this may affect the complexity of the objects beyond NP complexity. Simple objects include only two words, generally a determiner such as *o* 'that' or *bir* 'a/an' and a noun, whereas more complex objects are composed of five words, three of which involve the modifiers mentioned above. In this respect, the study investigates whether increasing the structural complexity of one object affects the processing of object ordering in Turkish ditransitive constructions.

2.3.3. Animacy

The scale of animacy is a cognitive one which starts from human, continues with animate until inanimate (Yamamoto, 1999). Animacy is generally discussed through hierarchical relations between different types of referents. Yamamoto (1999:27), following Foley and Van Valin (1985), represents the animacy hierarchy as follows:

(64) speaker/Addressee > 3rd Person Pronouns > human proper nouns > human common nouns > other animate nouns > other inanimate nouns

Referents that are higher in the hierarchy are generally considered more cognitively salient. Animate and human entities are generally placed in more prominent syntactic and discourse-related positions in the sentences due to their cognitive saliency. Subjects, for example, are mostly more prominent than objects. Similarly, topicalized constituents in the sentence are more prominent than non-topicalized ones. In addition, earlier positions in the sentence are generally reserved for more accessible and discourse-salient constituents. In this respect, animate entities are frequently used in more structurally prominent positions in various languages. When it comes to ditransitive constructions, recipients are more likely to be animate and human entities, whereas themes are typically inanimate. This asymmetry in animacy may influence object ordering, leading animate recipients to precede inanimate themes in many languages.

Generally, in language studies, distinctions related to animacy are often simplified into binary categories such as animate versus inanimate. Sometimes, human and non-human distinction is also used. However, Yamamoto (1999) claims that this distinction from human through animate to inanimate is not enough to explain the cognitive processes related to animacy. He talks about other factors which affect the animacy of an item such as the hierarchy of person, the individuation scale, semantic roles, and politeness.

The first one is hierarchy of persons which is generally used with the human category rather than with the non-human nouns or inanimates. It is argued that

first person and second person are higher in the animacy rank than third person (Yamamoto, 1999). This relates to the notion of empathy, and it is said that speakers feel more empathy for themselves or for the person to whom they are addressing compared to someone outside of the current context and this puts first and second person referents higher in the animacy hierarchy. In this study, all the objects that are compared in terms of animacy are in the form of third person so that there would be no difference between the rate of animacy between objects.

Individuation is related to how recognizable and specific an entity in the sentence is. The use of singular versus plural nouns, personal pronouns, proper names, and common nouns are some examples of this parameter in animacy hierarchy. For example, referents of singular nouns are generally easy to identify compared to the referents of plural nouns because the referents of plural nouns can be uncertain. When somebody uses the pronoun *we*, it is not easy to understand who the other person is, but when they use *I*, it is certain that that person is the speaker. Another example can be given with proper names and common names. When somebody refers to another person as *John,* it is much clearer who that person is compared to the expression *the assistant,* so some expressions are better at indicating who someone is compared to others and this individuation parameter is also affecting the animacy rate of an entity (Yamamoto, 1999). This study does not include any proper names or any pronouns as the accusative or dative object in experimental sentences. This also equates the animacy of the two objects in terms of individuation.

Semantic roles are also associated with different animacy ranks. For example, agency is closely related to animate entities, and the experiencer role is likewise typically associated with animacy. Agents and experiencers are not compared with other types of semantic roles in this study. Instead, the study mainly focuses on the placement of dative and accusative objects, which typically correspond to goal/recipient and theme roles, respectively. Although these semantic roles are associated with different degrees of animacy, they are necessarily compared in

this study because investigating the ordering of these two object types constitutes the main aim of the research.

Politeness is another parameter affecting animacy. People may prefer to use personal pronouns or common titles such as *Mr. President* to refer respectfully to the addressee. Conversely, they may use third-person pronouns to create social distance from a referent. These aspects can also affect the animacy degree of the referent as pointed out by Yamamoto (1999). However, this parameter is also not a factor affecting the animacy degree of direct and indirect objects in this study because politeness does not change in the expressions used in the experimental sentences.

All in all, this study focuses on animate and inanimate objects in ditransitive structures. The other parameters, like hierarchy of persons, individuation and politeness, are taken into consideration during the preparation of the experimental sentences so that any potential influence on the animacy manipulation was minimized. However, humanness is not considered so both human and non-human, but animate objects are classified as animate. This should be considered while interpreting the results in the discussion part.

Animacy has been argued to play an important role in a wide range of linguistic phenomena across languages. Case marking, number distinction, word order, subject selection, and topicality are identified as some linguistic phenomena which are influenced by the animacy hierarchy (Yamamoto, 1999). Case marking is a phenomenon which is examined often related to animacy. In some languages, animacy functions as a soft constraint, meaning that it influences speakers' preferences in constituent ordering or interpretation without affecting grammaticality. In other languages, however, animacy operates as a hard constraint and may directly affect the grammaticality of the sentence. Especially languages with richer morphological marking tend to be more sensitive to animacy. For example, Navajo is a language which differentiates animacy with morphology. In this language, when the agent is inanimate and the patient is animate, *bi*-form is employed. However, when the situation is reversed, *yi*-form is used. This distinction is exemplified with the following sentences in (65):

(65) a. At'ééd nímasi yi-díílíd.
girl potato burnt
'The girl burnt the potato.'

b. At'ééd nímasi bi-díílíd.
girl potato burnt
'The potato burnt the girl.'

(Zaenen et al., 2004: 2)

Our focus is on word order to stay in the boundaries of this research. It is reported that the constituents in different structures which are higher in the animacy rank are generally placed before the ones that are lower in various languages. English possessive is one of these structures. There are two genitive structures in English like [X's Y] or [the Y of X]. It is found that if X is stronger in terms of animacy, the first structure is preferred to the second. Another structure which is sensitive to animacy hierarchy is the coordinate phrases in the language of Shona. If two NPs are connected via a coordinator, the first is always the one which is higher in the hierarchy. Otherwise, the sentence becomes ungrammatical in this language, which means that animacy is a hard constraint in this language. As an example, (66b) is an ungrammatical sentence while (66a) is grammatical.

(66) a. mùrúmé né ímbẃa
man and dog
'the man and the dog'

b. *ímbẃa né mùrúmé
dog and man
'the dog and the man'

(Swierska, 1988: 59)

Another example is from an Australian language Gunwinggu. In this language, 1st and 2nd person pronouns precede the 3rd person pronouns because these

pronouns are higher in the animacy rank based on the hierarchy of persons as mentioned before.

(67) a. ŋa-be n-bun.
I they-ACC-will.hit
'I'll hit them.'

b. ŋa-n di-bun.
I-ACC they-will.hit
'They'll hit me.'

(Swierska, 1988: 57)

Navajo also displays sensitivity to animacy hierarchy in terms of argument ordering. Higher-animacy arguments must precede the lower-animacy arguments in this language, otherwise the sentence becomes ill-formed. In the example (68) below, the sentence is grammatical when the higher-animacy argument *hastiin* "man" precedes the lower-animacy argument *łíí'* "horse", but the sentence becomes ungrammatical when the lower-animacy argument comes first.

(68) a. hastiin łíí' yi-z-tał.
man horse 3SG-kick-PST
'The man kicked the horse.'

b. *łíí' hastiin yi-z-tał.
horse man 3SG-kick-PST
'The horse kicked the man.'

(Witherspoon, 1977, as cited in Yamamoto, 1999: 53)

Yamamoto (1999: 52–56) discusses these and other similar examples from different languages showing that constituent order is sensitive to animacy hierarchy.

The influence of animacy on constituent ordering is also discussed in relation to ditransitive structures. It is reported by Haspelmath (2015), animacy of the objects may affect the rigidity of the object order in some languages. For example, in a language called Jóola Banjal, object order in ditransitives is not flexible unless one of the objects is animate. DO>IO order is fixed when both objects are animate, but IO>DO order is possible depending on the animacy of the objects.

Corpus studies on ditransitive constructions also provide evidence regarding the role of animacy in object ordering. Bazhukov et al. (2021) analyze a Russian corpus related to the factors affecting ditransitive object order. Factors that they focus on are length, depth, animacy and role of individual verbs. Their findings indicate that the influence of length and depth is correlated, and it is very strong so there is a tendency to place shorter constituents before the longer ones. The influence of animacy is said to be moderate. While their findings indicate a preference of animate objects before inanimate objects in Russian ditransitive constructions, this preference is not very strong.

Another corpus study conducted by Kempen and Harbusch (2004) investigates the animacy effect related to the placement of arguments in German intransitive, transitive and ditransitive structures. They analyze sentences in relation to animacy, definiteness and pronominalization. Their results support direct influence of animacy, which means that animacy directly affects the order of constituents in the sentence and this influence is not a by-product of semantic role assignment. In German sentences, animate entities are placed before inanimate entities unless there is another factor affecting this order. They also add that animacy is not the only factor because they realize pronominality has a very strong effect on word order in German and this effect might even cancel out the animacy effect in the placement of the arguments.

In general, animacy has different effects across languages and investigating Turkish ditransitives in terms of animacy is an important contribution to the existing literature.

2.3.3.1. Animacy in Turkish

In Turkish, animacy is not an obligatory grammatical category, which means that it does not have separate animate and inanimate noun classes or agreement systems for animate and inanimate nouns. On the other hand, the effect of animacy is still observed in various grammatical and discourse phenomena (Göksel & Kerslake, 2004; Kornfilt, 1997). Erguvanlı-Taylan (1987) even reports that animacy influences permissible word orders in Turkish.

As discussed above, Yamamoto (1999) clearly shows that there is a hierarchy among NPs based on their animacy status and the referents that are placed higher in the hierarchy are mostly the ones which are cognitively more salient and therefore, they tend to occupy more prominent positions in sentences. Similarly, Göksel and Kerslake (2004) state that Turkish word order is affected by definiteness, specificity and animacy. It is clearly stated that animate and inanimate NPs have different word order possibilities by Erguvanlı-Taylan (1987). In the examples (70), when the subject is an indefinite animate subject like *bir adam* 'a man', it has two possible placement alternatives: either before or after the locative phrase. On the other hand, when the subject is an indefinite inanimate such as *bir paket* 'a package' as in (69), it is restricted to the preverbal position and cannot be placed at the beginning of the sentence. These observations suggest that animacy may contribute to the organization of constituents in Turkish sentences even though it is not morphologically encoded as a grammatical category.

(69) a. Masa-nın üst-ü-n-de bir paket dur-uyor.
table-GEN top-POSS-3SG-LOC one package.NOM stand-PROG.3SG
'There is a package on the table.'
(Lit. 'A package is standing/lying on the table.')

b.*Bir paket masa-nın üst-ü-n-de dur-uyor.
one package.NOM table-GEN top-POSS-3SG-LOC stand-PROG.3SG
(Intended) 'A package is on the table.'

(70) a. Kapı-nın ön-ü-n-de bir adam dur-uyor.
door-GEN front-POSS-3SG-LOC one man.NOM stand-PROG.3SG
'A man is standing in front of the door.'

b. Bir adam kapı-nın ön-ü-n-de dur-uyor.
one man.NOM door-GEN front-POSS-3SG-LOC stand-PROG.3SG
'A man is standing in front of the door.'

(Erguvanlı-Taylan, 1987: 220)

Recent psycholinguistic research on Turkish also supports the role of animacy in sentence production and constituent organization. Uzunca and Akal (2023), for example, demonstrate that animacy influences relative clause production and grammatical function assignment in Turkish.

Animacy effect in Turkish is also observed in agreement preferences. It is argued that overt plural agreement can be used with human plural subjects in Turkish. On the other hand, inanimate subjects are not frequently used with plural agreement (Göksel & Kerslake, 2004; Kornfilt, 1997; Sezer, 1978). This shows that animacy is also effective in agreement preferences like in word order as exemplified in (71) and (72).

(71) öğrenci-ler Londra-ya git-ti(-ler).
student-PL.NOM London-DAT go-PST.(-3PL)
'The students went to London.'

(72) kaya-lar vadi-ye doğru yuvarlan-dı.
rock-PL.NOM valley-DAT towards roll-PST.3PL
'The rocks rolled towards the valley.'

(Kornfilt, 1997: 271)

Turkish differential object marking (DOM) is traditionally connected with specificity and topicality. Yarar (2018) states that animacy has generally been considered a secondary factor in Turkish DOM compared to specificity and topicality. Recent studies also suggest that animacy may still affect Turkish DOM.

For instance, Krause and von Heusinger (2019) show that overt accusative marking is more acceptable with human DOs than with inanimate ones.

Their findings reveal a hierarchy such as Human > Animal > Inanimate in terms of the acceptability of overt accusative marking.

Considering that recipients in Turkish are mostly animate and human referents, it is likely that animacy affects object ordering preferences in ditransitive structures. Animate recipients may occupy the first-object position which is the structurally earlier and more prominent position.

In this study, animacy is operationalized as a binary category consisting of animate and inanimate objects. More detailed distinction within the animacy hierarchy can be helpful for the studies that focus exclusively on animacy affect. For the purposes of this study, binary categorization is adequate. In addition, animacy properties of the accusative and dative objects are equalized in the Experiment 1, 2 and 3 to control the animacy effect and observe the effects of other factors more clearly. On the other hand, accusative and dative objects have different animacy values in Experiment 4 because it aims to observe the animacy effect on ditransitive object ordering.

2.4. PSYCHOLINGUISTIC STUDIES ON DITRANSITIVE STRUCTURES

While in the previous sections, givenness, syntactic complexity and animacy are explained as separate factors affecting constituent order, there are many psycholinguistic studies conducted in different languages related to the comprehension, production and acquisition of ditransitive structures. These studies investigate how such factors influence the processing and production of different ditransitive object orders. They use various empirical methods like self-paced reading task, eye-tracking, elicitation task and picture-sentence matching task. There are also limited number of empirical studies in Turkish which are explained in the second part.

2.4.1. Psycholinguistic Studies in Various Languages

Many empirical studies on ditransitive constructions focus on how speakers comprehend, produce and acquire different object orders. These studies investigate the role of canonicality, prediction, givenness, syntactic complexity, animacy and thematic role on sentence processing in various languages.

A study conducted by Bornkessel et al. (2002) questions whether difficulties in the processing of German flexible word order arise from infrequency of that structure or from the grammatical principles of the language. It is known that non-canonical structures like object before the subject are harder to process in languages with flexible word order. The question is whether this difficulty is related to the infrequency of the structure or the violation of a grammatical rule in German. The researchers conduct an ERP study to investigate this non-canonical object before subject order, and they find that accusative objects when placed before the subjects cause a sudden difficulty cognitively. Dative objects do not create a difficulty at the beginning because dative objects can be placed at the beginning in German passives. However, it causes a reanalysis effect when the participants realize that it is not a passive structure, but an object-first structure. These results show that grammatical principles play a more important role in German language processing than frequency. Since both dative-first and accusative-first structures are infrequent in German, both structures would be expected to be difficult to process if frequency was the determining factor.

Another study conducted by Levy and Keller (2013) compares expectation and locality effects in German ditransitive structures. They conduct eye-tracking experiments to test two effects. First, they manipulate the existence of a dative object in the sentence, and they find that having a dative object before the verb in German increases the expectation of a ditransitive verb, creating anti-locality effect and that is why participants read the verb faster after a dative object. Second, they manipulate the memory load by turning the main clauses in the first experiment into a relative clause. This increases the memory load because there is longer distance between the verb and the subject, which is against the locality. They find that dative objects still facilitate the verb's ease of processing, but when

the memory load reaches the peak because of an adjunct, locality effect intervenes and reading time increases. Basically, it is possible to say that locality effect diminishes the effect of expectation, or anti-locality.

Koizumi and Tamaoka (2004) conducts a study investigating the cognitive processing of Japanese ditransitive structures and the canonical word order of ditransitives. The study compares the proposals of Hoji (1985, as cited in Koizumi & Tamaoka, 2004), Miyagawa (1997), and Matsuoka (2003, as cited in Koizumi & Tamaoka, 2004) regarding Japanese ditransitives. Hoji (1985, as cited in Koizumi & Tamaoka, 2004) claims that DAT>ACC order is the canonical order for all ditransitive verbs and ACC>DAT order is the scrambled order. Miyagawa (1997), however, argues that both orders are canonical and do not create a processing difference. Matsuoka (2003, as cited in Koizumi & Tamaoka, 2004) proposes that the canonical order depends on the verb type. While some verbs accept DAT>ACC order as the canonical order, others prefer ACC>DAT order. The study is conducted with 24 Japanese native speakers and researchers employ a plausibility judgement task in which they ask the participants to evaluate the plausibility of the sentences that they read. Their results indicate that DAT>ACC order is the canonical order in Japanese ditransitive structures just like Hoji proposes. More recent proposals by Miyagawa (1997) and Matsuoka (2003, as cited in Koizumi & Tamaoka, 2004) are not supported in this study. They also find that scrambled order is harder to process than canonical order by looking at the reaction times.

Korean is another language studied in terms of ditransitive structures. Shim and Han (2025) conduct a recent study in which they investigate the argument that Korean ditransitives have two structures i.e. postpositional dative and double object construction just like in English. They conduct an acceptability judgement task with 43 native speakers of Korean and they manipulate the sentence structure (postpositional dative versus double object), word order (goal>theme and theme>goal) and the type of the verb (lexical causative verbs and cwu-type verbs) in the experiment. They find that while postpositional dative structures have a very high acceptability rate, double object structures do not. In fact, the

rate of acceptability for double object structures is very close to ungrammatical control sentences. Different verb types or scrambled word order do not change this acceptability rate of the two structures. Based on the results, they argue that double object constructions in Korean are not real alternatives to the postpositional dative constructions in Korean ditransitives. They suggest that parallelism between Korean and English should be reconsidered.

The article written by Kim et al. (2022) investigates how L1 affects language processing while learning L2 through English ditransitive structures. The researchers find that native speakers of Chinese incorporate the restrictions of Chinese verbs into the process unconsciously while reading English sentences. The results of the experiment show that if a Chinese counterpart of a verb does not allow a certain structure, learners experience a mental hesitation while reading that structure in English. This indicates that both languages are always active in the mind of bilingual people, and this interaction is not just at the word level, it even reaches to grammatical integration.

Incremental sentence processing suggests that comprehenders start building the structure of the sentence immediately and make predictions about the upcoming constituents based on the information that is already available in the sentence. Some empirical studies on ditransitives also support this view. Arai et al. (2007) conduct a priming study with English ditransitive structures. In the study, they question whether priming is effective in sentence comprehension as in sentence production and they wonder whether this effect is independent from the verb or dependent on the repetition of the verb. To test their question, they conduct a study in which they observe the participants' eye movements while listening to a sentence with visual-world paradigm. There are two types of experiments. In the first, participants read a ditransitive sentence either in prepositional object structure or double object structure, then they listen to another sentence with the same verb. Participants correctly anticipate the object after the verb based on the priming sentence. In the second experiment, they change the verb in the experimental sentence, and it is found that priming effect disappears when the verb is different. In production studies, priming effect continues decreasingly even

if the verb is different from the one in the priming sentence. Different from production, priming effect disappears when the verb is different in this comprehension study, so it can be said that it is lexically dependent. The study also supports incremental sentence processing, demonstrating that listeners use verb-specific information to immediately project a syntactic structure and anticipate the upcoming argument order. Lastly, these findings support constraint-based lexicalist models which claim that the structure is built when encountered with the verb in contrast to the garden-path model which states that structure building process is postponed until the verb.

Some empirical studies specifically investigate the role of givenness in the processing and production of ditransitive constructions. Brown et al.'s study (2012) includes two experiments which look at the effect of givenness in English double object and prepositional object structures and animacy and givenness effect together. In the first experiment, they use a self-paced reading task and conclude that givenness effect is significant in double object constructions but not in prepositional object constructions in English. They relate this finding to the idea that canonical sentence orders are acceptable in a wider range of discourse contexts, whereas noncanonical orders generally require a more specific discourse context to license their use. Therefore, violations of givenness expectations create greater processing difficulty in more canonical structures.

Very similar results are obtained by Clifton and Frazier (2004) from a speeded acceptability judgement experiment. They also test whether given>new or new>given order is processed faster in English ditransitives and their findings also show that in double object constructions, given>new object order is easier while in prepositional object constructions, this effect is not observed.

Kizach and Balling (2013) also test the givenness effect related to the comprehension difficulty of Danish speakers in the first experiment of their study and they find that given>new order is indeed easier to comprehend in Danish compared to new>given order when there is a double object structure rather than prepositional object structure.

In another study conducted by Slioussar (2011), Russian ditransitive canonical and noncanonical word orders are compared related to the context requirements. In this study, she uses a self-paced reading task to understand whether Russian ditransitive noncanonical word order is processed faster with an appropriate context compared to inappropriate context. She finds that reading times are getting higher in relation to the inappropriateness of the contexts. Whether the structure is canonical or noncanonical does not affect the processing as long as context supports the structure.

Syntactic complexity or weight is another factor investigated in empirical studies on ditransitive structures. These studies generally examine whether short>long or long>short order is preferred in different languages and how the order of constituents with different syntactic complexity affects the processing and production difficulty.

Arnold et al.'s study (2000) compares two factors that are studied in this dissertation. One is newness and the other is weight. Their study has two parts: a corpus analysis and an elicitation experiment. In the corpus study, it is found that both givenness and weight are effective in the order of constituents in ditransitive constructions. Later, they test their findings with an elicitation experiment. They find that both givenness and syntactic complexity influence the order of constituents. In fact, their effect is stronger when one of them does not contrast with the other. In other words, longer constituents are mostly placed towards the end of the clause when that constituent is not new. In addition, given constituents are mostly placed earlier when they are not more complex than the other.

As mentioned above, Kizach and Balling (2013) study givenness effect in their first experiment and they find that it is an important factor in the comprehension of Danish ditransitives. In the second experiment, they compare the effects of givenness and complexity. With an acceptability judgement test, they find that when there is long-before-short order with Danish ditransitives, the effect of givenness is neutralized. In other words, it does not matter whether the order is given-before-new when the first object is longer than the second. However, when

the length of the objects in terms of number of words is equal or the order is short-before-long, givenness is an important factor. Given-before-new ordered sentences are processed faster when there is no contradictory effect of complexity. Based on these results, they infer that complexity is a more primary factor than givenness in the comprehension of Danish ditransitive constructions.

This short-before-long tendency is not observed in all languages. In contrast, some languages display a long-before-short tendency. For example, Yamashita and Chang's (2001) production study shows that speakers of Japanese tend to place longer constituents before shorter ones, regardless of whether these constituents are subjects and direct objects in transitive constructions or direct and indirect objects in ditransitive constructions.

In general, studies show that shorter constituents tend to precede longer ones in head-initial languages, whereas the reversed order is observed in head-final languages. This suggests that syntactic complexity is a relevant factor in both language types; however, the way it influences constituent order differs depending on the head direction of the language.

In addition to givenness and syntactic complexity, animacy is another factor investigated in empirical studies on ditransitive constructions.

Thuilier et al. (2021) argue that animacy effect is overridden in French ditransitives in favor of syntactic function and semantic role. Their sentence recall task shows that French speakers place inanimate direct objects before the animate indirect objects, which is against the animate before inanimate principle. This finding is in line with the results of their previous corpus studies related to animacy and word order. Thuilier and Danlos (2012) and Thuilier et al. (2014) do not observe a strong animacy effect on French word order either.

Velnić (2018) investigates various factors affecting object order in Croatian ditransitive constructions. The findings show that animacy is a stronger determinant of object order than givenness, although focus and the combination of focus and givenness create an even stronger influence. The study further

demonstrates that animacy affects object ordering in both adults and children. Specifically, when both the direct object and the indirect object are animate, both groups show a preference for the DO>IO order. Overall, the findings suggest that animacy is an important factor influencing object order in Croatian ditransitive constructions.

Drenhaus and Féry (2008) investigate German ditransitive structures in relation to animacy effects. However, their study does not focus on object order but it studies case marking of the objects. They examine children's case marking mistakes in German ditransitives related to animacy and their findings indicate that children make more mistakes with dative case marking on the indirect object when the direct object is inanimate. As an example, they sometimes use an accusative case on the indirect object when there is an inanimate direct object. On the other hand, they are able to use the correct case marking when both objects are animate, which is an interesting effect of animacy in children's grammar, and it may indicate that inanimate direct objects make the construction harder to produce so there are more mistakes produced by children in these constructions.

Based on the previous psycholinguistic studies on ditransitive structures, it appears like animacy is mostly an important factor which affects the order of objects in ditransitive constructions in different languages. However, there are also some languages which are not influenced by the animacy effect in relation to object order in ditransitives.

The present study investigates the effects of givenness, syntactic complexity and animacy on the processing of ditransitive object ordering in Turkish.

2.4.2. Psycholinguistics Studies in Turkish

There are limited number of studies which focus on the mentioned factors and study ditransitive structures empirically in Turkish. Kahraman et al.'s (2010) and Kahraman's (2013) studies are the examples of psycholinguistic research on animacy and ditransitives. Basically, Kahraman et al. (2010) test processing of

two object orders in Turkish ditransitives via a self-paced reading experiment and they find that different object orders are processed more easily based on the thematic role of the goal. When the goal is animate and possessive, DAT>ACC order is the easier one, whereas when there is an inanimate locative goal, ACC>DAT order is processed faster. In their study, only the animacy of the dative object is considered but the accusative object is always inanimate. Thus, in one condition, animate dative objects and inanimate accusative objects are used in the experimental sentences, but in the other condition, inanimate dative objects and inanimate accusative objects are used. This brings asymmetry to the two objects in question.

The ease of processing in DAT>ACC object ordering when the dative object is animate might be attributed to the animacy of that object or to the animacy difference between two objects. This situation may influence the results since animate objects when placed before the inanimate ones make processing easier as established in the previous literature.

Similar animacy constraints and thematic role effects are also investigated by Kurt and Bakay (2021), who, unlike Kahraman et al. (2010), equalize the animacy of the dative and accusative objects in their experiment. Their findings show that animacy of the dative object is not strong enough to change ACC>DAT order, which is claimed to be the canonical order in Turkish. However, when there is a supposedly noncanonical order as in DAT>ACC, dative object is mostly animate and accusative is inanimate.

In Experiment 1 of the present dissertation, the two objects are equalized in terms of givenness, syntactic complexity and animacy in order to minimize the potential influence of these factors on object ordering just like in Kurt and Bakay's study (2021).

In addition to the comprehension studies, Kahraman (2013) focuses on the production of these structures, and his findings show that production preferences in Turkish ditransitives also follow this thematic role differentiation of the dative

object. In short, possessive goals are generally placed before the themes and locative goals after the themes.

In an acquisition study, Turhan (2023) questions whether the changes in the order of direct object, indirect object and verb affect children's argument interpretation but she does not find any effect of the order. Her findings show that children acquire the arguments of ditransitive verbs until the age of 3, and they are not affected by the different orders of words in Turkish ditransitive constructions. This might also indicate that order change does not put extra difficulty to the processing of this structure.

There is another study which analyzes L1 Turkish and L1 German speakers' success in predicting the upcoming structure in English ditransitive structures (Şafak & Hopp, 2025). The study questions whether categorical or gradient verb constraints are used in second language prediction. Using the visual world eye-tracking method, the researchers analyze participants' gaze toward entities which depict a subject, a theme or a recipient while listening to an English ditransitive sentence. German L1 speakers are sensitive to both categorical and gradient verb constraints. While some verbs are restricted to a single syntactic structure, others can occur in more than one structure but show a preference for one of them. On the other hand, Turkish L1 participants are delayed in using categorical verb constraints and they show limited sensitivity to gradient constraints. The reason behind this difference relates to the word order of two native languages. Since German verbs are placed mostly before the objects, speakers can use the information provided from the verb earlier, even in L2 processing. However, Turkish is an SOV language which generally places the verb at the end. This structure leads the speakers to use verb information later. In addition, researchers find that Turkish L1 participants show a default preference for the prepositional object structure.

As stated in the previous part, there are not many experimental studies conducted on the ditransitive structure in Turkish. Most studies on ditransitives are related to language acquisition, and they are beyond the scope of the present study. This

makes this study very important since it is a rare one which studies the processing of ditransitive structure.

CHAPTER 3

METHODOLOGY

In this study, Turkish ditransitive object ordering variations, namely DAT>ACC or ACC>DAT, are examined in terms of their processing related to the following three factors: discourse givenness, syntactic complexity/weight and animacy. To analyze the effects of these factors, four self-paced reading experiments are designed and implemented. This chapter reports information related to the pilot study and the methodology of the main experiments. After introducing the pilot study, it presents information regarding the participants and the setting, materials and the data collection tool of four experiments. Then, data analysis method of each experiment is described in detail.

3.1. PILOT STUDY

This section introduces the pilot study conducted to evaluate the functionality and clarity of the experimental design before the main study.

3.1.1. Aim

Before data collection began, a pilot study was conducted to test whether the experiment was suitable for the aims of the study and whether participants can understand the instructions and complete the tasks without any difficulty. The pilot study was designed to identify potential methodological and technical problems before the main data collection process. Therefore, the aim of the pilot study was to evaluate the clarity and comprehensibility of the experimental materials, procedure and the overall functionality of the experimental design.

3.1.2. Participants

For the pilot study, a convenience sampling method was employed. A total of 10 native speakers of Turkish (5 male and 5 female) participated in the pilot study. Their ages ranged between 18 and 23 (M = 20.1, SD = 1.52). All participants

reported having at least one second language. They had no vision impairment or neurological disorder.

Processing differences between female and male participants were not targeted, and therefore, gender was not taken as a criterion. The sole criteria of the inclusion were that participants should be native speakers of Turkish and that they should be older than 18. Participants were selected from a group of undergraduate university students to ensure a similar level of education. In addition, university students were thought of being familiar with computers, which was necessary for the experimental procedure.

3.1.3. Materials and Procedure

The pilot study was conducted on the computer of the author in a silent and well-lit room. It consisted of four experiments. Each participant completed all four experiments. Experiment 1, 2 and 4 included 24 experimental items and Experiment 3 included 48 experimental items. The number of filler sentences was equal to the number of experimental items in each experiment. To illustrate the materials used in the pilot study, an example experimental item and a filler item are provided in (73) and (74) below.

Experimental item:

(73) a. Ben o not-u o pano-ya tuttur-du-m düzgünce.
I.NOM that note-ACC that board-DAT attach-PST-1SG properly

b. Ben o pano-ya o not-u tuttur-du-m düzgünce.
I.NOM that board-DAT that note-ACC attach-PST-1SG properly

'I properly attached that note to that bulletin board.'

Filler item:

(74) a. Ben o kardeşimi o otobüsle
I that sibling-1SG.POSS-ACC that bus-INS

ziyaret ettim hızlıca.
visit do-PST-1SG quickly
b. Ben o otobüsle o kardeşimi .
I that bus-INS that sibling-1SG.POSS-ACC
ziyaret ettim hızlıca
visit do-PST-1SG quickly
'I visited my sibling with that bus quickly.'

Participants took part in the experiments individually. At the beginning of each session, the author explained the procedure to the participants. Three sets of practice trials were provided to familiarize participants with the task. During these practice trials, the researcher remained present to intervene in case of any unexpected issues. After ensuring that participants understood the procedure, the researcher left the room, and participants continued the experiment independently.

3.1.4. Redesigning the Experiments Based on Pilot Findings

The participants took part in four experiments with a one-week interval in between. However, repeated exposure to the experimental materials may have increased participants' familiarity with the sentences, which may have led to priming effects in the later experiments, despite the time gap. Therefore, the design of the main experimental procedure was altered based on this observation. Instead of using the same group of participants in all four experiments, different participants took part in the experiments to minimize their potential familiarity with the materials and to reduce the priming effects. Participants did not encounter a different version of the same experimental sentence in the experiments.

3.1.5. Contributions of the Pilot Study

The pilot study was important since it validated both the experimental design and procedure. First, it confirmed that the instructions were clear and that participants were able to complete the self-paced reading task without difficulty. Second, it

ensured that the experimental setup, including the software and stimuli presentation, functioned properly. It also made clear that context is helpful for ensuring the givenness status of the objects and contexts are easily understood by the participants.

More importantly, the pilot study revealed a potential methodological issue related to repetition and familiarity with the experimental sentences. The observation that participants might be primed across sessions led to an important modification in the main study design, where different participant groups were assigned to different experiments. This change increased the internal validity of the study by reducing unwanted priming effect.

Overall, the pilot study contributed to improving the methodology and ensuring the reliability of the data collected in the main experiments.

3.2. MAIN EXPERIMENTS

The main investigation included four experiments to investigate the effects of object order on the processing of ditransitive sentences. Object order in Turkish ditransitives was investigated in relation to the following factors: givenness, syntactic complexity, and animacy of the object NPs. All four experiments were carried out through self-paced reading tasks. These tasks are commonly employed in psycholinguistic studies investigating online sentence processing and constituent order variation.

The study included both main analyses and follow-up analyses. Main analyses primarily examined word order together with the effects of givenness, syntactic complexity, and animacy depending on the experiment. These analyses were hypothesis-driven and included both region-based and total reading time comparisons. Follow-up analyses were conducted to further investigate the factors of interest and to control for potential positional confounds. These analyses were conducted on position-matched data.

The results are reported separately for each experiment. Main analyses include comparisons of both individual sentence regions and total reading times, whereas

follow-up analyses are reported under the relevant experiments. Main analyses were theoretically motivated comparisons, whereas follow-up analyses were targeted comparisons rather than the result of data-driven exploration.

The following sections provide detailed information about the participants, materials, data collection procedures, and data analyses of the four experiments separately.

3.2.1. Experiment 1

The main goal of the Experiment 1 was to observe whether there is a processing difference between DAT>ACC and ACC>DAT object orders in ditransitive structures in Turkish. The methodology of Experiment 1 is explained in detail below.

3.2.1.1. Participants

A total of 156 Turkish native speakers participated in the study, and 47 of them were male and 109 were female. All the participants were undergraduate students. They were studying in various departments other than the one where the researcher was working to avoid any potential authority relationship and any conflicting interests. The reason for selecting the participants from the university student population was to ensure that they were familiar with using computers, as the experiments were conducted via computer. Participants were recruited through convenience sampling. As it is known, in the convenience sampling technique, participation depends on practical criteria like geographical proximity, availability, accessibility and willingness to volunteer (Dörnyei, 2007: 99). Announcements about the study were distributed through instructors in different departments at Hacettepe University. Students who volunteered to participate contacted the researcher and were scheduled for individual experimental sessions. Participants' age ranged from 18 to 49 years (M = 21.62, SD = 3.20). All the participants reported normal or corrected-to-normal vision and no language related impairment. Participants were informed about the procedure of the experiment, and they were asked to complete an informed consent form (see

Appendix 7). The study was approved by the Ethics Committee of Hacettepe University (see Appendix 2).

3.2.1.2. Materials

The experimental materials consisted of Turkish ditransitive constructions containing an accusative-marked theme and a dative-marked recipient or goal. Following J. Öztürk (2008), verbs selecting both accusative and dative obligatory arguments were treated as ditransitive constructions. The materials included both transfer verbs such as *ver-* 'to give', *gönder-* 'to send', and *götür-* 'to take', and placement verbs such as *bırak-* 'to leave/place', *koy-* 'to put', and *yerleştir-* 'to place'.

The goal of Experiment 1 was to test whether ACC>DAT or DAT>ACC order was processed more easily when factors affecting word order in ditransitives, namely givenness, complexity, and animacy, were held constant. Also, with the help of a self-paced reading task, it was desired to observe whether there was any considerable processing difference between the regions in these sentences with two object orders. Therefore, only the object order (ACC>DAT and DAT>ACC) was manipulated in this experiment and dative and accusative objects in the same sentence had the same qualities in terms of givenness, animacy and syntactic complexity. To be more precise, if dative objects were animate, accusative objects were animate; if one type of object was given, the other was also given and both dative and accusative objects were short and simple.

There were 24 experimental sentences and 24 filler sentences in Experiment 1. 12 of the experimental sentences were in DAT>ACC order while other 12 were in ACC>DAT order since it aimed to observe the reading time difference between these orders. In all conditions, both objects were short and only had two words (demonstrative pronoun *o* 'that' or article *bir* 'a/an' and the object) to keep the complexity of the objects equal. Animacy was balanced in experimental sentences, meaning that there were 12 items containing two animate objects and 12 items containing two inanimate objects. Similarly, givenness was balanced. Thus, half of the experimental sentences had two given objects, and the other

half had two non-given objects. Given objects were mentioned in the previous short context before the experimental sentence and modified with the demonstrative pronoun *o* 'that' and non-given objects were not mentioned in the context and they were modified with the indefinite marker *bir* 'a/an'. Demonstrative and indefinite markers were used to increase the objects' givenness or non-givenness status considering that givenness is a gradient factor. In addition, as stated by Kornfilt (2003), in Turkish, interpretation of the oblique objects between specific or non-specific meaning is not certain. Since dative object is an oblique object, using of a demonstrative determiner before the dative objects helps to create givenness meaning. On the other hand, mentioning or not mentioning these objects in the previous context was the determining factor of the givenness status and demonstrative and indefinite markers supported it. Table 3.1 summarizes the experimental items.

Table 3.1 Distribution of Experimental Items in Experiment 1

Word Order	**Givenness**	**Animacy**	**Number of Items**
DAT>ACC	Given	Animate	3
DAT>ACC	Non-given	Inanimate	3
DAT>ACC	Given	Animate	3
DAT>ACC	Non-given	Inanimate	3
ACC>DAT	Given	Animate	3
ACC>DAT	Non-given	Inanimate	3

ACC>DAT	Given	Animate	3
ACC>DAT	Non-given	Inanimate	3
Total			24

Each experimental sentence was divided into five regions and presented to the participants in their own pace to record the reading time in each region (see Section 3.2.1.3. for details). These five regions were Subject, Object 1 (DAT or ACC), Object 2 (DAT or ACC), Verb and Adverbial regions. Region 5 which was the adverbial in the sentence and was added to the sentence to accommodate for wrap-up effect and it was not included into total reading time of the sentence in the analysis. Jiang (2013) states that it takes longer time to press the button after reading the last part of the sentence in experiments like this. This means that the reading time spent at the end of the sentence is not reflecting the real processing there. That is why a manner adverb was added to the end of every experimental sentence as the Region 5 and the time spent in this region was not included into the total reading time of the sentence. Representative Turkish examples and their English translations are given in Table 3.2 below; each quadruplet shows the given vs. non-given and DAT>ACC vs. ACC>DAT variants. The rest of the experimental items are provided in Appendix 3.

Table 3.2 Example Sentences in Experiment 1

Condition	**Experimental Sentence (Turkish)**	**Experimental Sentence (English)**
Inanimate-Given DAT>ACC	Ben o kütüphaneye o kitabı bıraktım kolayca.	*I sent the library the book easily.

Inanimate-Given ACC>DAT	Ben o kitabı o kütüphaneye bıraktım kolayca.	I sent the book to the library easily.
Inanimate-Non-given DAT>ACC	Ben bir kütüphaneye bir kitabı bıraktım kolayca.	*I sent a library a book easily.
Inanimate-Non-given ACC>DAT	Ben bir kitabı bir kütüphaneye bıraktım kolayca.	I sent a book to a library easily.
Animate-Given DAT>ACC	Ben o komşuya o kediyi götürdüm gizlice.	*I took the neighbor the cat secretly.
Animate-Given ACC>DAT	Ben o kediyi o komşuya götürdüm gizlice.	I took the cat to the neighbor secretly.
Animate-Non-given DAT>ACC	Ben bir komşuya bir kediyi götürdüm gizlice.	*I took a neighbor a cat secretly.
Animate-Non-given ACC>DAT	Ben bir kediyi bir komşuya götürdüm gizlice.	I took a cat to a neighbor secretly.

There were 24 filler sentences in the experiment. These fillers were added to the data to increase variety and to reduce participants' awareness of the manipulation. All the filler sentences contained two objects as the experimental sentences. However, in the filler sentences, one object was marked with an instrumental case *-le/-la* 'with' and the other object was marked with the accusative case. Filler sentences were also controlled and kept in same

properties in terms of givenness and animacy like experimental sentences. These sentences looked similar to the ditransitive sentences in structure apart from the instrumental case and dative case difference. The structural similarity between fillers and experimental sentences was intentional to prevent participants from distinguishing between them and thus to ensure that they continued the experiment without being aware of the experimental manipulation. Example (75) illustrates a filler sentence used in Experiment 1 and the rest of the filler items are provided in Appendix 3.

(75) a. Ben o mahalleyle o semti karşılaştırdım kolayca.
I that neighborhood-INS that district-ACC compare-PST-1SG easily

b. Ben o semti o mahalleyle karşılaştırdım kolayca.
I that district-ACC that neighborhood-INS compare-PST-1SG easily
'I easily compared that district with that neighbourhood.'

Experimental items and filler items were counterbalanced across four trial lists using a Latin-square design. Each participant was assigned to one list and was therefore exposed to only one version of each experimental sentence (i.e., either the DAT>ACC or the ACC>DAT version). This counterbalancing procedure ensured that all sentence versions were tested across participants while preventing carry-over, repetition, and priming effects that could have arisen if participants had been exposed to multiple versions of the same experimental item.

3.2.1.3. Data Collection Tool and Procedure

This section explains the procedure followed in Experiment 1 and provides details regarding the self-paced reading task.

3.2.1.3.1. Self-Paced Reading Task

Self-paced reading (SPR) studies developed alongside eye-tracking studies out of an interest in understanding human language comprehension processes in real time through tasks that resemble natural reading conditions (Jegerski, 2013).

Since then, self-paced reading studies are among most frequent studies employed in psycholinguistics because of its effectiveness and easiness.

In language comprehension studies, there are various paradigms and dimensions. For example, eye-fixation method, reading-time measure and button pressing method are considered as paradigms (Just et al., 1982). Furthermore, these paradigms are defined related to four dimensions. The first dimension is whether the researcher or the participant decides on the duration of which a word is displayed on the screen. The second dimension is whether the exposure time to the stimuli is the same or not for all words or regions. Whether the words that are previously encountered disappears or not is the third dimension. The last dimension is whether the stimuli words are displayed consecutively in the screen as in reading or in the in the same spot all the time. It is also indicated that it is not possible to use all paradigms with any one of these dimensions. To illustrate, if participants decide on the duration of exposure to the stimuli, then there cannot be a fixed duration time for the words.

In self-paced reading studies, the sentences are either presented as word by word or segment by segment and reading time for each word or segment is recorded via a computer to measure the difficulty of that word or segment. These tasks are also called subject-paced because it is the subject who decides on the pace of the study which means that it is not a fixed-paced study in which researchers appoint fixed reading time for each word or segment (Jegerski, 2013). In self-paced reading studies, participants generally encounter the word or region on the computer screen and when they press the appointed button, the next word/segment appears, and the program records the reading time for the button presses. Participants reveal the whole sentence with button presses during the experiment. These self-paced reading experiments can be conducted using two methods: cumulative and noncumulative, as mentioned in the third dimension above. In the cumulative display method, when participants press the button, a new segment appears while the previous segment remains visible. However, this method is reported to create certain difficulties because participants may press the button repeatedly to reveal all segments and then read

the entire sentence afterwards (Just et al., 1982). Ferreira and Henderson (1990) also report similar limitations of the cumulative display method. The other way is called noncumulative display method and in this type of self-paced reading experiments, one region disappears when the other region appears in the screen, so the participants generally do not pass one region without reading it. Furthermore, self-paced reading tasks can be organized with moving window technique or in the centered format which is related to the fourth dimension. In centered format, all the regions or words are displayed in the center of the screen but in the moving window technique, they appear in their original position in a sentence as in normal reading.

In most of the reading studies, the time spent while reading the word or sentence is considered as the time of processing. This is called eye-mind assumption (Just & Carpenter, 1980). Although the relationship between reading and comprehension time is more complicated than how it is described in eye-mind assumption, it is still possible to understand the comprehension difficulty by looking at the reading time data and this is a method used in various studies of comprehension.

In Experiment 1, a self-paced reading task in which participants determined their own exposure times was employed; therefore, the duration of exposure was not fixed. Participants read the experimental sentences region by region on the screen. There were five regions in experimental sentences. The first region was always the subject. The second and third regions contained the dative and accusative objects, with their order varying depending on the condition. The fourth region was the verb, and the final region was an adverb added to the experiment to control for the wrap-up effect. The experiment employed a noncumulative display method, and all regions were presented at the center of the screen.

Also, the time participants spent reading each region before pressing a button to proceed to the next region was measured in milliseconds and referred to as reading time (RT). In this study, RT was taken as an indicator of processing.

3.2.1.3.2. Trial Structure

Participants voluntarily participated in the experiment and signed an informed consent form at the beginning, and they were informed that they could leave the experiment anytime they wanted.

The self-paced reading experiment started with a welcome screen which stated the name of the study and explained how the participants could pass the screen during the experiment. After the welcome screen, there was instruction for the practice trials and there were three practice trials with comprehension questions at the beginning to familiarize the participants with the experiment. During this period, the researcher stayed with the participants to answer any question that a participant might have. When practice trials were over, the researcher left the room. Participants were informed on the screen that they would start the experiment whenever they were ready. An instruction screen was presented first, and participants were asked not to linger while reading the experimental sentences. Instead, they were instructed to read the sentences at their own pace without rushing. The instruction screen explained that the participants would first read a short paragraph and could press the space bar to continue after finishing it. Following the paragraph, a fixation cross appeared at the center of the screen, and participants passed the fixation cross by pressing the space bar. Then, the target sentence continuing the paragraph was presented region by region (five regions in total), with each region being revealed by pressing the space bar. All the regions were displayed in the center of the screen, and one region disappeared when the participants pressed the space key and the other region revealed. The figure 3.1 shows how experimental sentences are displayed.

(76) Context: Üst komşum çok hayvan sever biri. Sokak hayvanlarıyla zaten hep ilgiliydi ama kendisi bir hayvan sahiplenememişti bir türlü. Geçen gün bir ilanda küçücük bir kedi gördüm. Komşuma sürpriz yapabileceğimi düşündüm.

Translation: My upstairs neighbor is a big animal lover. He had always been interested in stray animals, but he had never been able to adopt one himself. I saw a tiny cat in an ad the other day. I thought I could surprise my neighbor.

‘I brought that cat to that neighbor secretly.’

	Region 1	Region 2	Region 3	Region 4	Region 5
+	Ben	o kediyi	o komşuya	götürdüm	gizlice
(fixation)	I	that cat-ACC	that neighbor-DAT	take-PST-1SG	secretly

	Region 1	Region 2	Region 3	Region 4	Region 5
+	Ben	o komşuya	o kediyi	götürdüm	gizlice
(fixation)	I	that neighbor-DAT	that cat-ACC	take-PST-1SG	secretly

Figure 3.1 Example Presentation Sequence in the Self-paced Reading Experiment

When the experimental sentence was finished, a comprehension question was asked. It was an easy multiple-choice question with two options related to the objects in the sentences. Comprehension questions were asked to check whether the participants read the experimental sentence or not. Wrong answers were deleted from the analysis, but the participants did not get any feedback related to their answers. At the end, there was a goodbye screen that finished the experiment. The experiment took around 15-20 minutes depending on the participants’ pace.

3.2.1.3.3. Experimental Setting and Software

The experiment took place in a quiet, well-lit room. Participants were tested individually and the researcher left the room after the practice trials. All the distractors were minimized in the room so that they would have not affect the RT results.

A software called Psychopy (Peirce et al., 2019) was used to conduct Experiment 1. Participants read the short contexts and sentences through this program, and their reading time (RT) was recorded in milliseconds via Psychopy. The program

also allowed to ask comprehension questions and recorded the answers. A laptop with a standard keyboard was used to collect the data. Space key was used to move forward in the experiment. The experiment took around 15-20 minutes. Participants were informed that they could rest while reading the contexts if they wanted to, but it was not possible to stop the experiment at one point and continue later.

3.2.1.4. Data Analysis

This section presents the statistical analysis method of the reading time data. First, it is explained how the data were prepared for analysis and how the outlier analysis was conducted. For statistical analysis, linear mixed-effects models (LMEMs hereafter) were implemented in R (R Core Team, 2025). Main analyses were conducted on separate regions and on total reading times. A follow-up analysis was also conducted to compare dative and accusative objects in the same position.

3.2.1.4.1. Data Preparation and Screening

This part summarizes data preparation procedure for the analysis. Raw data included trial-level dataset. It included dependent variables i.e. region-based reading times and total reading times in milliseconds. Experimental conditions such as object order as well as participant and sentence information were included in the dataset.

When the participants answered a comprehension question wrong, the reading time data for that sentence and for the regions were excluded from the dataset. There was no other a priori trial removal. No absolute reaction time cut-off was applied prior to outlier detection. For outlier detection, Interquartile Range (IQR) was applied and values which were below Q1 - 1.5 x IQR or above Q3 + 1.5 x IQR (Tukey's fences) were treated as outlier and replaced with missing values (NA). The IQR procedure was applied separately to each reading region and to the total reading time. Experiment 1 contained 931 observations before outlier trimming. After the removal of 46 outliers (4.94%), the final dataset consisted of 885 observations. Missing values (NA) came only from outlier removal. There

was no other missing value from the raw dataset. na.exclude option was used while analyzing.

Relevant categorical variables and random-effect grouping variables were converted to factors before the analyses.

To evaluate the adequacy of the sample size, an a priori power analysis was conducted separately for each experiment using GPower 3.1.9.7 (Faul et al., 2009). Because the primary hypotheses involved within-participant comparisons and GPower does not directly support linear mixed-effects models, the required sample size was approximated using two-tailed one-sample t tests based on participant-level difference scores. Assuming a medium effect size (Cohen's d_z = 0.50), an alpha level of .05, and statistical power of .80, the minimum required sample size was estimated to be 34 participants for each experiment. Although the experimental materials were distributed across four counterbalanced lists using a Latin-square design, all 156 participants completed each experiment. Therefore, the effective sample size for each experiment was 156 participants, substantially exceeding the estimated minimum requirement.

3.2.1.4.2. Statistical Modeling Approach

LMEM analysis was applied to the dataset to analyze reading time in relation to object order. The models were fitted to trial-level observations.

LMEM analysis is a widely employed method used for reading time analysis in psycholinguistic studies. An advantage of LMEM is that it allows the researcher to account for participant-level and item-level random variability. It provides reliability in ensuring that the results are not random outcomes stemming from these factors. It is specifically important for repeated measures designs because multiple observations are gathered from the same participants and sentence items, creating non-independence in the data.

The analyses were conducted in the R statistical environment (R Core Team, 2025). LMEMs were fitted and the lme4 package was used for the main analyses (Bates et al., 2015). P-values were obtained via the lmerTest package

(Kuznetsova et al., 2017). In addition, the dplyr and tidyr packages were used for data preprocessing and ggplot2 was used to create visuals.

Reading time data measured in milliseconds were the dependent variable in the analysis. Both region-based reading time and total reading time were analyzed separately by using LMEMs. The main fixed effect was the order of the objects (ACC>DAT or DAT>ACC). The models included random intercepts for participants and sentences to account for by-participant and by-item variability. Initially, random-slope structures were explored during model building. However, these models resulted in convergence problems. Therefore, the final analyses were conducted using random-intercept models, which provided stable model estimation while accounting for variability across participants and sentence items. The models had the following general form:

RT ~ FixedEffects + (1 | participant) + (1 | sentence)

By conducting lmerTest, p-values were obtained and the significance of the fixed effects were evaluated based on these p-values. The alpha level was .05. Models were fitted separately for every region and for the total reading time. Some follow-up mixed-effects analyses were also conducted to address specific research questions. The same random-effects structure was maintained across analyses, with participants and sentences modelled as random intercepts. All analyses were conducted on trial-level observations without prior aggregation.

As an additional robustness check, all analyses were repeated using log-transformed reading times. The corresponding results are presented in Appendix 8.

3.2.1.4.3. Main Analyses

The main analyses examined whether reading times differed between ACC>DAT and DAT>ACC object orders in Turkish ditransitive sentences. There were five regions in the experiments, and these regions were tested separately by using LMEM. These regions were Subject (Region 1), Object 1-ACC or DAT (Region 2), Object 2-ACC or DAT (Region 3), Verb (Region 4), and Adverbial (Region 5)

regions. In addition to region-based analyses, total reading time analyses were also conducted using LMEM. LMEM was preferred because it can be applied to repeated measures and it can account for random effects like subject and item variability. The analyses were conducted in R statistical environment, and lme4 package was employed for the main analyses.

In Experiment 1, the main independent variable was object order (ACC>DAT vs DAT>ACC). Reading time was the dependent variable. Separate LMEMs were fitted for each region and for total reading time.

3.2.1.4.4. Position-Controlled Object Comparisons

A position-controlled object comparison was conducted as an additional analysis across experiments to examine the effect of object type (ACC or DAT) independent of linear position. One goal of this analysis was to disambiguate findings obtained from the main analyses.

In this analysis, the data was transformed into long-format. Trial-level observations were analyzed. Every object was coded as a separate observation. The objects were coded according to their linear positions as first- and second-position objects. This variability of position was used in the analysis. Two LMEMs were employed for first- and second-position objects. Reading times of the accusative and dative objects in the same position were compared. In other words, first-position accusative objects were compared to first-position dative objects and second-position accusative objects were compared to second-position dative objects. This enabled us to control the effect of position.

LMEM was used for the analysis, and lmerTest was conducted. Fixed effect was the object type (ACC or DAT) and random intercepts were participant and sentence. Comparisons were made within the same position.

One important methodological limitation of this analysis was that accusative, and dative objects were not equalized in terms of lexical length. This was because the analysis was conducted post-hoc and therefore had an explanatory rather

than confirmatory purpose. That is why the results of this analysis should be interpreted with caution.

3.2.2. Experiment 2

Experiment 2 aims to investigate the effects of givenness together with the object order on the processing of Turkish ditransitive sentences. It mainly questions whether the given DO>nongiven IO and nongiven DO>given IO orders lead to differences in processing and whether effect of givenness change depending on the object type. These two orders were presented to the participants in four versions which are described below.

3.2.2.1. Participants

The participants of this experiment were those who took part in Experiment 1 reported in Section 3.2.1.1. More specifically, 156 native speakers of Turkish participated in Experiment 2.

3.2.2.2. Materials

In Experiment 2, there were 24 experimental sentences and 24 filler sentences. Half of the experimental items included animate objects, while the other half included inanimate objects since animacy was the controlled factor in this experiment. Experiment 2 employed a 2×2 factorial design with word order (DAT>ACC vs. ACC>DAT) and givenness pattern (Given DAT–Non-given ACC vs. Given ACC–Non-given DAT) as the main independent variables. Each condition contained three items, resulting in a total of 24 experimental sentences. In addition, each sentence had four different versions, and each version was assigned to a different participant group. Table 3.3 shows the distribution of experimental items in Experiment 2.

Table 3.3 Distribution of Experimental Items in Experiment 2

Animacy	Word Order	Givenness Pattern	Number of Items

Animate	DAT>ACC	Given DAT – Non-given ACC	3
Animate	ACC>DAT	Non-given ACC – Given DAT	3
Animate	DAT>ACC	Non-given DAT – Given ACC	3
Animate	ACC>DAT	Given ACC – Non-given DAT	3
Inanimate	DAT>ACC	Given DAT – Non-given ACC	3
Inanimate	ACC>DAT	Non-given ACC – Given DAT	3
Inanimate	DAT>ACC	Non-given DAT – Given ACC	3
Inanimate	ACC>DAT	Given ACC – Non-given DAT	3
Total			**24**

Experiments 1 and 2 were similar in terms of the structural properties of the items tested. However, each experimental sentence in Experiment 2 contained one given and one non-given object realized either as dative- or accusative-marked objects. Thus, one object, which can be either dative or accusative, was mentioned in the previous context and introduced with the demonstrative determiner *o* 'that', while the other was not mentioned in the context, and was used with *bir* 'a/an'. These two conditions are names as given dative and given accusative conditions. The reason behind this manipulation was to examine whether givenness contrast between the dative and accusative objects affected the processing of ditransitive object orders. Representative sentences from

Experiment 2 are presented in Table 3.4 and the complete dataset can be found in Appendix 4.

Table 3.4 Example Sentences in Experiment 2

Word Order	**Givenness Status**	**Example**	**Translation**
ACC>DAT	ACC object given	Ben o koliyi bir eve taşıyacağım kolayca.	I will carry that box to a house easily.
ACC>DAT	DAT object given	Ben bir koliyi o eve taşıyacağım kolayca.	I will carry a box to that house.
DAT>ACC	ACC object given	Ben bir eve o koliyi taşıyacağım kolayca.	*I will carry a house that box easily.
DAT>ACC	DAT object given	Ben o eve bir koliyi taşıyacağım kolayca.	*I will carry that house a box easily.

The number of animate and inanimate objects in this experiment was equal and both objects in the experimental sentences were matched in terms of animacy, meaning they were both animate or inanimate. Syntactic complexity of the objects was controlled and was kept simple with only two words as in Experiment 1.

The only difference between Experiment 1 and 2 was related to the givenness contrast between the dative and accusative objects in the experimental sentences. Other aspects of the materials, including verb types, sentence

structure, object length, and region segmentation were identical to those used in Experiment 1. The filler sentences had the same manipulations as the experimental sentences, so one NP was given and the other NP was non-given in the sentences as exemplified in sentence (77) below. The complete set of fillers were provided in Appendix 4.

(77) a. Ben bir oyun-la o çocuğ-u oyala-dı-m güzelce.
I a game-INS that child-ACC entertain-PST-1SG well

b. Ben o çocuğ-u bir oyun-la oyala-dı-m güzelce.
I that child-ACC a game-INS entertain-PST-1SG well
'I entertained that child well with a game.'

A 2×2 within-subjects factorial design was employed in the experiment. Word order and givenness status were the independent variables, while reading time (RT) was the dependent variable. Experimental items and filler items were counterbalanced across four trial lists using a Latin-square design. Each participant was assigned to one list and was therefore exposed to only one version of each experimental sentence. This counterbalancing procedure ensured that all sentence versions were tested across participants while preventing carry-over, repetition, and priming effects that could have arisen if participants had been exposed to multiple versions of the same experimental item.

3.2.2.3. Data Collection Tool and Procedure

The experimental procedure was identical to that of Experiment 1 (see Section 3.2.1.3.).

3.2.2.4. Data Analysis

The same data preparation, outlier screening procedure, and statistical modeling approach described in Experiment 1 were employed in Experiment 2. Experiment 2 contained 932 observations before outlier trimming. After the removal of 57

outliers (6.12%), the final dataset consisted of 875 observations. Missing values (NA) resulted only from outlier removal.

In Experiment 2, the main fixed effects were word order (ACC>DAT vs. DAT>ACC) and givenness pattern. Reading time was the dependent variable. Region-based reading times and total reading times were analyzed separately using LMEMs Random intercepts for participants and sentences were included in the models. In addition to the main analyses, condition-specific comparisons were conducted to examine the effect of givenness while controlling for object position.

3.2.2.4.1. Position-Controlled Object Comparisons

The same position-controlled object comparison described in Experiment 1 was conducted (see Section 3.2.1.4.1.).

3.2.2.4.2. Condition-Specific Comparisons

Another follow-up analysis was conducted to isolate the effect of givenness while controlling for object position. The effect of givenness was tested by comparing the same object types in the same position. To be more precise, first-position given accusative objects and first-position non-given accusative objects were compared. Similarly, second-position given accusative objects were compared with second-position non-given accusative objects. Parallel analyses were also conducted for dative objects.

Analyses were conducted on trial-level object reading times. These comparisons were made under matched positional conditions in order to minimize potential word order confounds. Depending on the experiment, separate LMEMs were used for dative and accusative object reading times as well as for first-position and second-position objects. The fixed effects included the manipulated factors relevant to each experiment, such as givenness, syntactic complexity, animacy, and their interactions with word order. The same random-intercepts structure was maintained across analyses. The dependent variables were the reading times of the accusative and dative objects.

3.2.3. Experiment 3

In Experiment 3, the effects of syntactic complexity/weight on Turkish ditransitive object orders are analyzed. More specifically, long>short and short>long object orders are compared in terms of regional and total reading times in Turkish DAT>ACC and ACC>DAT ordered sentences. The methodology of the experiment is described below.

3.2.3.1. Participants

The same participants described in Experiment 1 also participated in Experiment 3 (see Section 3.2.1.1).

3.2.3.2. Materials

The aim of the Experiment 3 was to test whether syntactic complexity operationalized as number of words affected the comprehension difficulty of the ditransitive structures in different object orders or not. It had a similar design to the previous experiments. However, there were short and long objects in the same experimental sentence in Experiment 3. One object, either accusative or dative, was the longer object, and the other one was shorter to create a syntactic complexity difference between the objects. The main aim was to test whether the long>short or the short>long order was processed faster in Turkish ditransitive sentences. However, two objects had the same properties in terms of givenness and animacy, so both were either animate or inanimate and either given or non-given. There was an equal number of sentence which included given/non-given objects and animate/inanimate objects. There were 48 experimental sentences in total and half of them had a long dative object and a short accusative object, which is the long dative condition and the other half, namely the long accusative condition had sentences with the reversed pattern. The number of filler sentences was equal to the number of experimental sentences. Table 3.5 shows the distribution of experimental items in Experiment 3.

Table 3.5 Distribution of Experimental Items in Experiment 3

Animacy	Givenness	Long Object	Word Order	Number of Items
Animate	Both Given	Long ACC	ACC>DAT	3
Animate	Both Given	Long ACC	DAT>ACC	3
Animate	Both Given	Long DAT	ACC>DAT	3
Animate	Both Given	Long DAT	DAT>ACC	3
Animate	Both Non-given	Long ACC	ACC>DAT	3
Animate	Both Non-given	Long ACC	DAT>ACC	3
Animate	Both Non-given	Long DAT	ACC>DAT	3
Animate	Both Non-given	Long DAT	DAT>ACC	3
Inanimate	Both Given	Long ACC	ACC>DAT	3
Inanimate	Both Given	Long ACC	DAT>ACC	3
Inanimate	Both Given	Long DAT	ACC>DAT	3
Inanimate	Both Given	Long DAT	DAT>ACC	3
Inanimate	Both Non-given	Long ACC	ACC>DAT	3

Inanimate	Both Non-given	Long ACC	DAT>ACC	3
Inanimate	Both Non-given	Long DAT	ACC>DAT	3
Inanimate	Both Non-given	Long DAT	DAT>ACC	3
Total				**48**

The examples of the experimental items used in the Experiment 3 are given in the Table 3.6 below. The complete dataset is presented in Appendix 5.

Table 3.6 Example Sentences in Experiment 3

Givenness Status	**Syntactic Complexity Pattern**	**Word Order**	**Example**	**Translation**
Given	Short DAT-Long ACC	DAT>ACC	Ben o duvara o keyifsiz ve kalın kitabı fırlattım hızlıca.	*I threw against that wall that seedy and thick book quickly.
Given	Short DAT-Long ACC	ACC>DAT	Ben o keyifsiz ve kalın kitabı o duvara fırlattım hızlıca.	I threw that seedy and thick book against that wall quickly.

Given	Long DAT-Short ACC	DAT>ACC	Ben karşımdaki o çok temiz duvara o kitabı fırlattım hızlıca.	*I threw at the very clean wall in front of me that book quickly.
Given	Long DAT-Short ACC	ACC>DAT	Ben o kitabı karşımdaki o çok temiz duvara fırlattım hızlıca.	I threw that book at the very clean wall in front of me.
Non-given	Short DAT-Long ACC	DAT>ACC	Ben bir duvara kalın ve ağır bir kitabı fırlattım hızlıca.	*I threw to a wall a thick and heavy book quickly.
Non-given	Short DAT-Long ACC	ACC>DAT	Ben kalın ve ağır bir kitabı bir duvara fırlattım hızlıca.	I threw a thick and heavy book to a wall quickly.
Non-given	Long DAT-Short ACC	DAT>ACC	Ben evdeki bomboş kırmızı bir duvara bir kitabı fırlattım hızlıca.	*I threw at a completely empty, bright red wall at home a book quickly.
Non-given	Long DAT-Short ACC	ACC>DAT	Ben bir kitabı evdeki bomboş kıpkırmızı bir	I threw a book at a completely empty, bright red

	duvara fırlattım hızlıca.	wall at home quickly.

The experiment had a 2×2 within-subject factorial design. Word order (ACC>DAT vs. DAT>ACC) and syntactic complexity (short DAT–long ACC vs. long DAT–short ACC) were the independent variables, while reading time (RT) was the dependent variable. Potential confounds such as givenness, and animacy were counterbalanced across conditions. However, unlike Experiment 2, givenness was not manipulated as an independent variable but was balanced across items. Experimental sentences were distributed across four trial lists using a counterbalanced design. Because each experimental item had eight versions but only four trial lists were used, two versions of the same item were necessarily assigned to the same list. These versions were selected to differ maximally with respect to the manipulated variables (e.g., object order, givenness status, and the identity of the long object), thereby minimizing repetition, carry-over, and priming effects while ensuring that all experimental conditions were represented across participants.

Experiment 3 differed from other three experiments in terms of the syntactic complexity difference between two types of objects. Other than this, materials had similar properties. Both transfer verbs and placement verbs are employed. The filler sentences were constructed following the same format as the experimental sentences in Experiment 3. Apart from the subject NP, one NP was simple and the other NP was relatively more complex. An example filler item is given in (78) below, and the full list of filler sentences can be found in Appendix 5.

(78) a. Ben o bilgisayar-la baş-ım-ın bela-sı
I that computer-INS head-1SG.POSS-GEN trouble-3SG.POSS
ol-an o rapor-u hazırla-dı-m gizlice.
be-PART that report-ACC prepare-PST-1SG secretly

b. Ben baş-ım-ın bela-sı ol-an
I head-1SG.POSS-GEN trouble-3SG.POSS be-PART
o rapor-u o bilgisayar-la hazırla-dı-m gizlice.
that report-ACC that computer-INS prepare-PST-1SG secretly
'I secretly prepared that report, which was the bane of my existence, with that computer.'

3.2.3.3. Data Collection Tool and Procedure

This experiment also followed a similar procedure to the other experiments (see section 3.2.1.3.)

3.2.3.4. Data Analysis

The same data preparation, outlier screening procedure, and statistical modeling approach described in Experiment 1 were employed in Experiment 3. Experiment 3 contained 1867 observations before outlier trimming. After the removal of 83 outliers (4.45%), the final dataset consisted of 1784 observations. Missing values (NA) resulted only from outlier removal.

Reading time was the dependent variable as in previous experiments. The main fixed effects were object order (ACC>DAT vs. DAT>ACC) and syntactic complexity (long dative-short accusative and long accusative-short dative conditions). Regional and total reading time analyses are conducted separately using LMEMs. Sentences and participants were included as random intercepts.

3.2.3.4.1. Position-Controlled Object Comparisons

The same position-controlled object comparison described in Experiment 1 was conducted (see Section 3.2.2.4.1.).

3.2.3.4.2. Condition-Specific Comparisons

The analyses in Experiment 3 differed slightly from the analyses of Experiment 1 and 2 because long and short objects could not be directly compared due to the inherent lexical and length difference between them. Therefore, to be able to observe the effect of syntactic complexity while controlling the effect of position,

the order and complexity interaction was analyzed to determine whether syntactic complexity modulated the effect of word order in this experiment.

3.2.4. Experiment 4

The animacy effect is investigated in relation to the processing of Turkish ditransitive object orders in Experiment 4. To be more precise, the experiment examines whether the animate>inanimate and inanimate >animate object orders lead to differences in processing of Turkish ditransitive structures. The methodology of Experiment 4 is explained below.

3.2.4.1. Participants

The same group of participants described in Experiment 1 also participated in Experiment 4 (see Section 3.2.1.1).

3.2.4.2. Materials

Animacy was the factor that was tested in Experiment 4. Experimental design was similar to the other three experiments but this time, there was animacy difference between the objects. If the accusative object was animate, dative object was inanimate, or vice versa. These two conditions are named as animate accusative and animate dative conditions while reporting the results. Animate>inanimate or inanimate>animate orders were compared in terms of reading time to investigate whether there was a comprehension difficulty difference between these orders. The other two factors, namely givenness and syntactic complexity, were controlled in the analysis, and the objects were matched with respect to these properties. Table 3.7 below presents sample items from Experiment 4. The complete set is provided in Appendix 6.

Table 3.7 Example Sentences in Experiment 4

Givenness	Animacy Pattern	Word Order	Example	Translation

Given	Animate DAT-Inanimate ACC	DAT>ACC	Ben o öğretmene o olayı anlatacağım.	*I'm going to report to that teacher that incident.
Given	Animate DAT-Inanimate ACC	ACC>DAT	Ben o olayı o öğretmene anlattım.	I'm going to report that incident to that teacher.
Given	Inanimate DAT-Animate ACC	DAT>ACC	Ben o bahçeye o tavşanı saldım.	*I relased into the garden that rabbit.
Given	Inanimate DAT-Animate ACC	ACC>DAT	Ben o tavşanı o bahçeye saldım.	I released that rabbit into the garden.
Non-given	Animate DAT-Inanimate ACC	DAT>ACC	Ben bir öğretmene bir olayı anlatacağım.	*I'm going to report to a teacher an incident.
Non-given	Animate DAT-Inanimate ACC	ACC>DAT	Ben bir olayı bir öğretmene anlatacağım.	I'm going to report an incident to a teacher.

Non-given	Inanimate DAT-Animate ACC	DAT>ACC	Ben bir bahçeye bir tavşanı saldım.	*I released into a garden a rabbit.
Non-given	Inanimate DAT-Animate ACC	ACC>DAT	Ben bir tavşanı bir bahçeye saldım.	I released a rabbit into a garden.

There were 24 experimental sentences in Experiment 4 and 24 filler sentences. Experimental sentences were divided into groups based on givenness and animacy. Table 3.8 below presents distribution of experimental items in Experiment 4.

Table 3.8 Distribution of Experimental Items in Experiment 4

Animacy Configuration	**Givenness**	**Word Order**	**Number of Items**
Animate DAT-Inanimate ACC	Given	DAT>ACC	3
Animate DAT-Inanimate ACC	Given	ACC>DAT	3
Animate DAT-Inanimate ACC	Non-given	DAT>ACC	3
Animate DAT-Inanimate ACC	Non-given	ACC>DAT	3
Inanimate DAT-Animate ACC	Given	DAT>ACC	3

Inanimate DAT-Animate ACC	Given	ACC>DAT	3
Inanimate DAT-Animate ACC	Non-given	DAT>ACC	3
Inanimate DAT-Animate ACC	Non-given	ACC>DAT	3
Total			**24**

The experiment employed a 2×2 within-subjects factorial design. Word order and animacy were the independent variables, whereas reading time (RT) was the dependent variable. Experimental items and filler items were counterbalanced across four trial lists using a Latin-square design. Each participant was assigned to one list and was therefore exposed to only one version of each experimental item. This counterbalancing procedure ensured that all sentence versions were tested across participants while preventing carry-over, repetition, and priming effects that could have arisen if participants had been exposed to multiple versions of the same experimental item. Givenness and syntactic complexity were controlled variables and were counterbalanced across participants so that each participant encountered an equal number of sentences containing given and non-given objects. In addition, all objects consisted of only two words.

Animacy difference between the two types of objects was the only difference from the previous three experiments. Verb types, experimental sentence structure and regional division of the sentences were same as described in Experiment 1. The filler sentences in Experiment 4 were constructed following the same format as the experimental sentences. One of the object NPs was animate, whereas the other was inanimate. This arrangement was intended to mirror the animacy contrast employed in the experimental materials. An example filler item is provided below, and the complete set of filler sentences is presented in Appendix 6.

(79) a. Ben o sıvı-yla o kab-ı doldur-du-m düzgünce.
I that liquid-INS that container-ACC fill-PST-1SG properly
b. Ben o kab-ı o sıvı-yla doldur-du-m düzgünce.
I that container-ACC that liquid-INS fill-PST-1SG properly
'I properly filled that container with that liquid.'

3.2.4.3. Data Collection Tool and Procedure

This experiment also followed a similar procedure to the other experiments (see section 3.2.1.3.).

3.2.4.4. Data Analysis

The same data preparation, outlier screening procedure, and statistical modeling approach described in Experiment 1 were employed in Experiment 4. Experiment 4 contained 931 observations before outlier trimming. After the removal of 54 outliers (5.80%), the final dataset consisted of 877 observations. Missing values (NA) resulted only from outlier removal.

3.2.4.4.1. Position-Controlled Object Comparisons

The same position-controlled object comparison described in Experiment 1 was conducted (see Section 3.2.1.4.1).

3.2.4.4.2. Condition-Specific Comparisons

Experiment 4 tested the effect of animacy for the same type of objects in the same position. Following the same procedure in Experiment 2, first-object position animate accusative objects were compared with first-position inanimate accusative objects using LMEMs. The same analyses were conducted separately for second-position accusative objects, as well as first- and second-position dative objects.

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, the results obtained from four experiments are reported with Tables and Figures. Then, the findings are discussed in relation to these results making references to the previous findings.

4.1. RESULTS AND DISCUSSION OF THE FINDINGS

To analyze the reading time differences between the ACC>DAT and DAT>ACC orders, several statistical analyses were conducted. Before conducting the analyses, the IQR method was used to eliminate outliers from both the regional reading time data and the total reading time data. Regional analyses and total reading time analyses were conducted separately. In addition, further comparisons were performed to uncover reading time differences resulting from different object positions and from objects with different properties, such as given versus non-given objects. The results of these analyses are reported under the related experiments below.

The data obtained from each experiment were analyzed using linear mixed effects models. LMEMs were preferred because the study included repeated observations from both participants and sentence items, and this method accounted for the variability associated with individual participants and sentences simultaneously. All analyses included participants and sentences as random intercepts.

In Tables below, estimates of fixed effects and random effects are presented separately. Positive estimate values presented in the fixed effects sections indicate an increase in reading time, whereas negative values indicate a decrease in reading time. In the random effects sections, participant variance, sentence variance, and residual variance values are reported. Residual variance represents the unexplained variability that remains after the fixed and random

effects are accounted for in the model. P-values smaller than 0.05 are considered statistically significant.

As a robustness check, all analyses were repeated using log-transformed reading times. Overall, the log-transformed analyses yielded the same overall pattern of findings as the analyses based on raw reading times. One additional effect emerged after log transformation, with the DAT region in the animate-accusative condition reaching statistical significance. However, this did not alter the overall interpretation of the findings. The complete results are presented in Appendix 8.

Following each experiment, a separate discussion section is provided focusing on the specific findings of that experiment. After Experiment 1, the discussion centers on whether there is an easier or more preferred object order in Turkish ditransitive structures. Following Experiment 2, the effects of givenness are discussed; after Experiment 3, the discussion focuses on syntactic complexity/weight effects; and after Experiment 4, the role of animacy is examined. This organization is adopted in order to present the findings and their interpretations in a more concise and systematic manner.

4.1.1. Results of Experiment 1: Object Order Effect

As mentioned earlier, Experiment 1 is conducted to observe whether there is a reading time difference between two object orders of Turkish ditransitive sentences which is exemplified in (80):

(80)

Context: Bu kocaman dolap burada fazlalık yapıyor, geçişe engel oluyor. Karşıdaki ofisin de dolap eksiği var. Benim de aklıma bir fikir geldi hemen.

‘This huge cabinet is unnecessary here and blocks the passage. The office across the hall also needs a cabinet. I immediately came up with an idea.’

a. Ben o dolab-ı o ofis-e yerleş-tir-di-m sessizce.
I.NOM that cabinet-ACC that office-DAT place-CAUS-PST-1SG quietly
‘I placed the cabinet in that office quietly.’

b. Ben o ofis-e o dolab-ı yerleş-tir-di-m sessizce.
I.NOM that office-DAT that cabinet-ACC place-PST-1SG quietly
'I placed the cabinet in that office quietly.'

In this experiment, direct and indirect objects have similar properties. Specifically, all direct and indirect objects are given or non-given, animate or inanimate and syntactically complex or syntactically non-complex. In this experiment, their order is manipulated to reveal the processing or reading time differences in two orders of the objects. Reading time analyses are conducted for every region and for total reading time separately.

4.1.1.1. Results of the Total Reading Time Analysis

A total reading time analysis is conducted using LMEMs to reveal the potential differences between the ACC>DAT and DAT>ACC object orders in ditransitive sentences. In the analysis, while word order is the independent variable, reading time is the dependent variable. The results of the analysis are presented in Table 4.1.

Table 4.1 LMEM Analysis of Total Reading Time in Experiment 1

Fixed Effect

Effect	**Estimate*[2] (DAT>ACC)**	**Estimate (ACC>DAT)**	**SE**	**t**	**p**
Word Order	+22.29	-22.29	30.88	+0.722	0.471

Random Effects

[2] Estimate values represent the estimated change in reading time relative to the reference condition in the LMEM analysis. Positive values indicate increased reading time, whereas negative values indicate decreased reading time.

Random Effect	Var.	SD
Part. (Intercept)	200628	447.9
Sent. (Intercept)	1211	34.8
Residual	208996	457.2

As can be seen in Table 10, the total reading time difference between the DAT>ACC and ACC>DAT word orders is 22.29 milliseconds. An LMEM analysis is conducted with word order as a fixed effect and participants and sentences as random intercepts. The analysis reveals that this difference is not statistically significant ($t = 0.722$, $p = 0.471$). This finding suggests that two object orders, namely ACC>DAT and DAT>ACC order, does not strongly change the overall processing time in the present data set. In other words, participants process the two object order alternatives at a broadly similar pace when total sentence reading times are considered.

Importantly, this result indicates that neither the DAT>ACC nor the ACC>DAT order provides a clear overall processing advantage at the sentence level. Therefore, potential processing differences related to object ordering may emerge locally within specific sentence regions rather than affecting the entire sentence uniformly. The following figure presents this result visually.

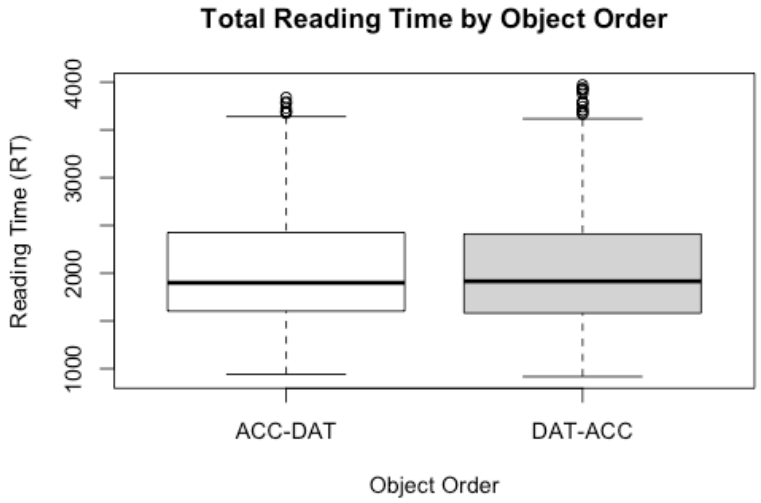

Figure 4.1 Boxplot of Total Reading Time Differences between the Two Object Orders in Experiment 1

Figure 4.1 visually demonstrates minimal but not statistically significant total reading time difference between ACC>DAT and DAT>ACC object orders in the ditransitive sentences when two types of objects have similar properties in terms of givenness, syntactic complexity and animacy.

In the following sections, the results of regional analysis on this condition is presented.

4.1.1.2. Results of the Region-Based Reading Time Analyses

Reading times for each region are analyzed using LMEMs in order to examine the effect of word order across sentence regions. In the analyses, word order is the independent variable and reading time is the dependent variable just like in total reading time analysis. There are five regions in total; subject, object 1, object 2, verb and adverbial regions. The last region is included to account for the wrap-up effect. Table 4.2 presents the results each region.

Table 4.2 Region-based LMEM Analyses in Experiment 1

Fixed Effects

Region	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	-7.176	+7.176	6.846	-1.048	0.295
DAT	-26.544	+26.544	9.141	-2.904	0.0038**
ACC	+37.368	-37.368	8.971	+4.166	<0.001***
Verb	+5.026	-5.026	10.040	+0.501	0.617
Adv.	+5.398	-5.398	8.948	+0.603	0.547

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	6015	77.56	0	0.00	9931	99.65
DAT	11565.6	107.54	268.6	16.39	18393.4	135.62
ACC	13202	114.90	0	0.00	17555	132.50
Verb	14996.5	122.46	914.1	30.23	21707.8	147.34

Adv.	9024.9	95.00	84.3	9.182	17434.8	132.041

Table 4.2 presents the results of LMEM analyses conducted for each sentence region in Experiment 1. The analyses reveal that word order does not significantly affect reading times in the subject, verb, and adverbial regions. This suggests that the processing differences between the ACC>DAT and DAT>ACC orders emerge specifically in the object regions and other regions are not affected by the object order in the sentence. Although the adverbial region is the region where a wrap-up effect is expected since it comes after the end of the sentence, no statistically significant difference is observed in this region. These findings indicate that the processing difference associated with object ordering is largely restricted to the object positions themselves.

Unlike other regions, both object regions show significant processing differences depending on word order. The reading time of the dative object significantly increases when it appears in the second object position in the ACC>DAT order (Estimate = +26.544, t = -2.904, p = .0038). Similarly, the accusative object is read significantly more slowly when it occurs in the second object position as in DAT>ACC order (Estimate = +37.368, t = 4.166, p < .001). Importantly, these LMEM findings demonstrate that increase in the reading time in object positions is not related to the case marker, but it is associated with the linear order of the objects. In other words, the second object is processed more slowly regardless of whether it is marked with accusative or dative case.

Figure 4.2 below is a line chart visualizing the reading time difference of the regions between the two object orders.

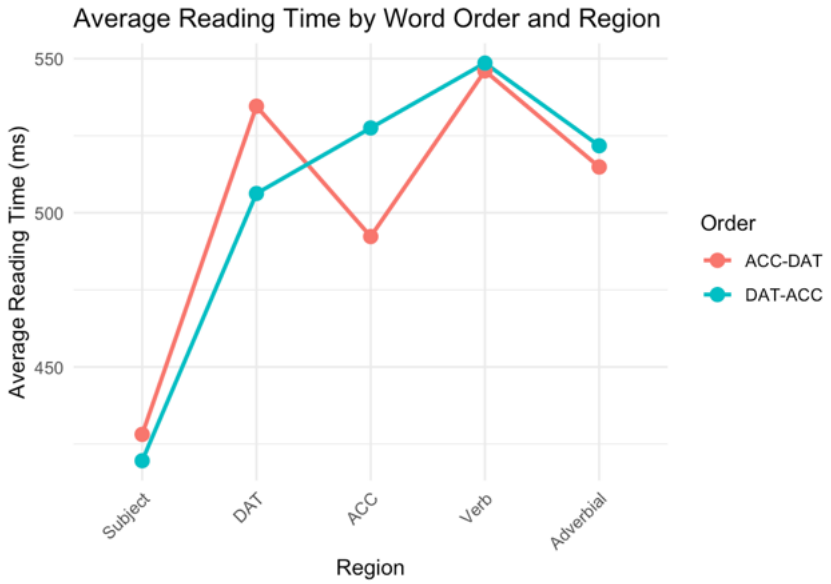

Figure 4.2 Line Chart of Regional Reading Time Differences between the Two Object Orders in Experiment 1

As illustrated in Figure 4.2, the difference between the reading times of the object regions of accusative and dative is very clear whereas other regions such as subject, verb and adverbial have very close reading times in ACC>DAT and DAT>ACC orders.

4.1.1.3. Animacy-Based Follow-Up Analyses

Previous studies suggest that animacy of the dative object may influence the object order in Turkish ditransitive structures (Kahraman, 2013; Kahraman et al. 2010). Specifically, it is proposed that high possessive goals expressed as animate dative objects are placed before the themes which are the accusative objects, whereas low locative goals expressed as inanimate dative objects are placed after the themes. To test this hypothesis in language processing, animate and inanimate object datasets in Experiment 1 are also analyzed separately with LMEMs. It should be noted that two objects do not differ in terms of givenness, syntactic complexity and animacy in this dataset. In the analysis, word order is the fixed effect while participants and sentences are random intercepts.

Table 4.3 shows the LMEM analyses of the animate dataset in Experiment 1.

Table 4.3 LMEM Analyses of Animate Objects Condition

Fixed Effects

Measure	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	+4.525	-4.525	9.567	+0.473	0.637
DAT	-17.70	+17.70	13.74	-1.289	0.198
ACC	+30.62	-30.62	12.95	+2.364	0.0187*
Verb	+29.089	-29.089	14.938	+1.947	0.052
Adv.	+7.151	-7.151	12.804	+0.558	0.577
Total RT	+56.192	-56.192	48.309	+1.163	0.246

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	5324.94	72.97	15.93	3.99	8863.98	94.15
DAT	10636	103.1	0	0.0	19435	139.4
ACC	13500	116.2	0	0.0	16504	128.5

Verb	13837	117.63	2196	46.86	22529	150.10
Adv.	8507.3	92.24	258.6	16.08	16808.8	129.65
Total RT	180888	425.31	3368	58.04	234832	484.59

The LMEM results in Table 4.3 demonstrate that no sentence region other than the accusative object region shows a statistically significant difference between the orders of ACC>DAT and DAT>ACC. The only significant effect is observed in the accusative object region, where the accusative object is read significantly faster in the ACC>DAT order (Estimate = +30.62, t = 2.364, p = 0.0187). This finding suggests that processing advantage observed in the dative region when it is the first object in the previous analysis does not consistently emerge when both objects are animate in the sentence. In other words, animate dative objects are not processed faster in the first-object position when accusative object is also animate.

No statistically significant difference is observed in total reading time between the two object orders. This suggests that animacy features of the objects used in this condition does not create a strong processing advantage for either the ACC>DAT or DAT>ACC ordered sentences.

In Table 4.4 below, the LMEM results of the inanimate objects condition are reported.

Table 4.4 LMEM Analyses of Inanimate Objects Condition

Fixed Effects

Measure	**Estimate (DAT>ACC)**	**Estimate (ACC>DAT)**	**SE**	**t**	**p**

Subject	-19.055	+19.055	10.342	-1.842	0.066
DAT	-37.437	+37.437	13.131	-2.851	0.0046**
ACC	+44.44	-44.44	13.48	+3.297	0.0010**
Verb	-16.91	+16.91	15.10	-1.12	0.264
Adv.	+7.175	-7.175	13.329	+0.538	0.591
Total RT	-11.41	+11.41	44.72	-0.255	0.799

Random Effects

Measure	**Part. Var.**	**Part. SD**	**Sent. Var.**	**Sent. SD**	**Resid. Var.**	**Resid. SD**
Subject	6559	80.99	0	0.00	10470	102.3
DAT	12278.4	110.81	709.2	26.63	17320.6	131.61
ACC	11587.96	107.65	33.41	5.78	18672.32	136.65
Verb	13594	116.6	0	0.0	22616	150.4
Adv.	9469	97.31	0	0.00	17709	133.07
Total RT	199513.43	446.67	94.98	9.75	200325.31	447.58

As Table 4.4 shows, subject, verb, and adverbial regions do not show a statistically significant difference in terms of reading time. Total reading time of the inanimate ACC>DAT and DAT>ACC ordered sentences are also very similar (Estimate = 11.41, t = 0.255, p = 0.799). On the other hand, reading times of the dative object region and accusative object region differ significantly with object order. While inanimate dative object is read faster in DAT>ACC order (Estimate = -37.437, t = -2.851, p = 0.0046), inanimate accusative object is read faster in ACC>DAT order (Estimate = -44,44, t = 3.297, p = 0.001).

This result indicates that both object types are read faster when they appear as the first object in the sentence. Therefore, the processing pattern observed in the total dataset also continues in the inanimate object condition. This suggests that inanimacy of the objects does not create a substantial difference in the processing of ACC>DAT and DAT>ACC object orders.

The animacy-based analyses do not support the suggestion that there are two types of dative objects with different preferred positions in Turkish ditransitive sentences. When dative object is animate, it is not processed faster in the first-object position which has been proposed as the preferred position for possessive goals. Similarly, inanimate dative objects are not processed faster in the second-object position, which has been associated with locative goals.

4.1.1.4. Position-Controlled Object Comparison

To explore whether dative or accusative objects show a processing advantage in a particular sentence position, additional analyses compare dative and accusative objects within the same positional slot. More specifically, the analyses test whether one object type is processed faster than the other in first-object position and similarly in the second-object position. Table 4.5 presents the results of these same-position object comparisons using LMEMs. In these analyses, object type (DAT vs. ACC) is the fixed effect, while reading time is the dependent variable. Separate analyses are conducted for first- and second-position objects. The results of these analyses are presented in Table 4.5:

Table 4.5 LMEM Analysis of Same-position Object Comparison in Experiment 1

Fixed Effects

Position	Estimate (DAT)	Estimate (ACC)	SE	t	p
First	+18.090	-18.090	8.618	+2.099	0.036*
Second	+5.324	-5.324	9.457	+0.563	0.574

Random Effects

Position	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
First	13262.603	115.16	8.823	2.97	16272.060	127.56
Second	11695.0	108.14	101.6	10.08	19569.0	139.89

Table 4.5 illustrates that the accusative object is read significantly faster than the dative object (Estimate = -18.09, t = 2.10, p = 0.036) in the first-object position. However, in the second-object position, there is no statistically significant difference between the reading times of the accusative and dative objects. This finding may suggest that object type creates a limited processing difference in the first-object position, whereas such a difference does not emerge in the second-object position.

4.1.1.5. Discussion on Experiment 1: Easier Object Order

Several studies have shown that canonical orders are processed faster than noncanonical orders across various languages (Erdocia et al., 2009; Daiki &

Satoshi, 2025; Koizumi et al., 2014; Rösler et al., 1998; Sekerina, 2003; Tamaoka et al., 2024). This processing difference between these structures is generally attributed to the complexity difference between the canonical and noncanonical structures. Gibson (1998) suggests that if there is no other factor affecting processing, noncanonical structures are processed harder because they are syntactically more complex and demand higher cognitive effort. Based on this assertion, it is anticipated that canonical ditransitive order in Turkish would be processed faster in the first experiment.

Canonical order in Turkish ditransitive sentences, however, is still debated. Some researchers such as Georgala (2011) proposes that DAT>ACC is the canonical order, while others like İşsever (2006), Kornfilt (1997), Kural (1992) and Kurt & Dinçtopal Deniz (2023) state that ACC>DAT order is the default order. Göksel and Kerslake (2004) suggest that although accusative marked objects are placed before the oblique marked objects in Turkish unmarked sentences, they also point out that there is no strict rule which determines the order of case-marked noun phrases. When both noun phrases are definite, the more predictable one comes before the other noun phrase so this suggests that canonical word order in Turkish ditransitive sentences changes according to information structure.

There are some other scholars who point out that canonical order in Turkish ditransitive sentences changes based on the type of the dative object (Öztürk, 2005). Öztürk states that there are two types of goals expressed through a dative object in Turkish ditransitive sentences. While high possessive goal is an animate dative, low locative goal is an inanimate dative, and high possessive goal is canonically placed before the theme.

Kahraman (2013) and Kahraman et al. (2010) investigated the role of dative object animacy in a production study and a self-paced reading experiment. Their findings showed that animate dative objects were produced more frequently and processed more quickly when they preceded the accusative object. Although Kahraman et al. (2010) explicitly state that testing Öztürk's proposal (2005) is not the primary aim of the study, their findings are discussed in relation to the distinction between possessive and locative goals. Kurt and Bakay (2021) also

conducted a production experiment on Turkish ditransitive structures. They controlled the animacy of the accusative objects as well as the dative objects, which differs from Kahraman's study (2013). Their findings indicate that animacy of neither dative nor accusative object is not strong enough to change ACC>DAT order, which is claimed to be the canonical order. Animacy of these objects shows itself mainly in DAT>ACC order. Basically, DAT>ACC order is mostly preferred when dative object is animate or accusative object is inanimate.

Since there are many diverging ideas regarding the canonical object order of ditransitive structures, an empirical study comparing the processing of the two orders may provide valuable evidence for identifying a potential default order in Turkish ditransitives. There are similar studies which investigate canonical and scrambled order in ditransitive structures in flexible word order languages like Persian (Abdollahnejad, 2020).

The findings of Experiment 1 indicate that there is no clear processing advantage for either ACC>DAT or DAT>ACC object order. In addition, regional analyses do not show any reading time difference which suggest that one order is easier than the other. Only the accusative and dative object regions show significant reading time difference, but this difference indicates that the first-object position is processed faster than the second-position object independent from the object type.

A follow-up analysis is conducted to compare reading times of the accusative and dative objects in the first- and second-object positions, and this analysis also does not reveal a consistent processing advantage for either object type in either object order. However, this comparison should be interpreted with caution, as the accusative and dative objects were not fully controlled in terms of lexical and structural properties such as length, frequency, or complexity.

These findings suggest that there is no clear processing advantage for a specific object order in Turkish ditransitive structures. Importantly, they may suggest that canonicality and processing ease do not always directly correspond in Turkish ditransitive structures. That is, structures that are processed more easily are not

always those considered canonical or most basic in a language. For example, Yamashita (1997) shows that scrambled sentences are not necessarily processed more slowly, and Bader (1994) similarly argues that scrambled or unmarked structures are not inherently extremely more complex than the canonical structures. He suggests that in German, the real processing difficulty arises when a noncanonical order is combined with case ambiguity and the verb-final nature of the language.

Turkish is a head-final language, but it has a rich case marking system that clearly signals grammatical roles like German. This may allow comprehenders to process different object orders with similar ease, even when those orders are considered noncanonical.

The absence of a significant processing advantage for either ACC>DAT or DAT>ACC object order is unlikely to be explained by insufficient statistical power. An a priori power analysis suggested that the sample size substantially exceeded the estimated minimum requirement. Therefore, the null findings are more likely to reflect the absence of a robust processing preference between the two object orders under the present experimental conditions than insufficient sensitivity to detect an existing effect.

Regarding the animacy effect put forward by Öztürk (2005) and later discussed in relation to the findings of Kahraman (2013), Kahraman et al. (2010), and Kurt and Bakay (2021), animate and inanimate object conditions were analyzed separately in the first experiment. When the animacy of the accusative and dative objects was equalized, no processing advantage was observed for either order in either condition. This may indicate that animacy of the accusative and dative objects alone does not make one order easier than the other. The animacy effect reported in Kahraman (2013) and Kahraman et al. (2010) may instead be related to the animacy contrast between the accusative and dative objects in their experiments, rather than to the distinction between different types of dative objects associated with animacy. Alternatively, the difference between the findings of the previous studies and the present study may stem from the discourse contexts presented before the experimental sentences.

Overall, the findings of the Experiment 1 suggest that no single object order is consistently easier to process in Turkish ditransitive structures sampled in the study. This might result from the fact that Turkish ditransitive constructions do not have a single fixed canonical object order. Instead, both orders are equally unmarked, or object ordering preferences may vary depending on information structure, as discussed by Göksel and Kerslake (2004). This possibility is further examined in Experiment 2, where information structure is directly manipulated.

4.1.2. Experiment 2: Word Order and Givenness Effect

Experiment 2 questions whether givenness status of the objects influences the regional and total reading time in the ditransitive two object order variations. In this experiment, the dative and accusative objects in the same sentence differ in terms of givenness. While one object is marked as given through a preceding context and the demonstrative marker *o* 'that', the other object is marked as non-given by not being mentioned in the context and by the use of the indefinite marker *bir* 'a/an'.

4.1.2.1. Overall Object Order Analysis (Givenness Collapsed)

These analyses are conducted on the overall dataset of Experiment 2 by collapsing the givenness status of the objects. The purpose of this analysis is to observe the general processing pattern of the dataset independent of the givenness manipulation. More specifically, the analysis aims to investigate whether the dataset reveals a general object order effect regardless of the givenness status of the objects. Table 4.6 presents the LMEM results of the total reading time comparisons in Experiment 2 with collapsed givenness condition. In this analysis, object order is the independent variable, whereas reading time is the dependent variable. Table 4.6 presents the results of the analysis:

Table 4.6 LMEM Analysis of Total Reading Time in Experiment 2

Fixed Effects

Effect	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	T	p
Word Order	-34.87	+34.87	26.71	-1.305	0.192

Random Effects

Random Effect	Var.	SD
Part. (Intercept)	211072.8	459.43
Sent. (Intercept)	792.9	28.16
Residual	154581.9	393.17

Table 4.6 shows that total reading times of the two orders show similar patterns, and there is no statistically significant difference between the sentences with ACC>DAT and DAT>ACC orders. The LMEM results of the overall dataset in Experiment 2 do not indicate a considerable processing difference between ACC>DAT and DAT>ACC object orders. The boxplot below visualizes the reading time distributions of the two orders.

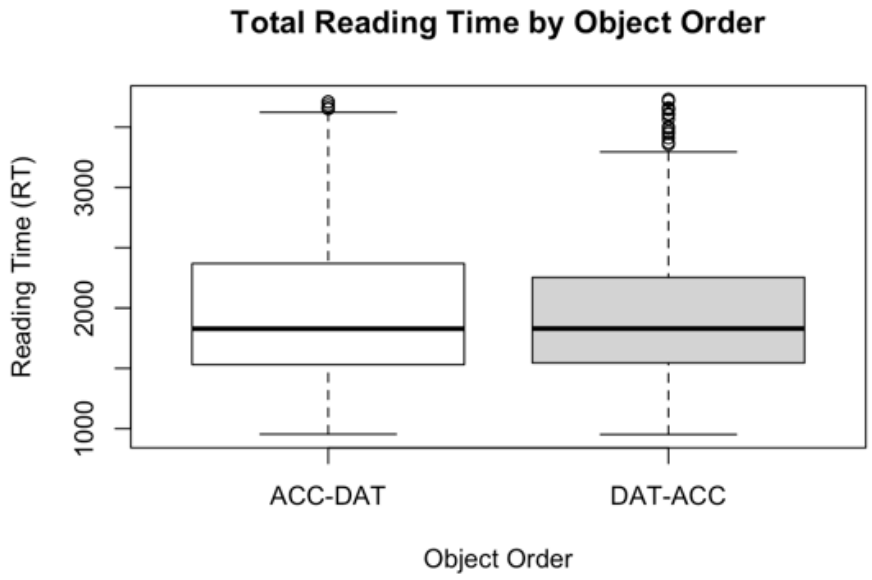

Figure 4.3 Boxplot of Total Reading Time Differences between the Two Object Orders in Experiment 2

As illustrated in Figure 4.3, reading times of the ditransitive sentences with ACC>DAT and DAT>ACC object orders do not show a substantial difference.

In Experiment 2, regions are also analyzed using LMEMs in relation to the object order in the sentence. In this analysis, reading time of five regions are analyzed in two object orders. The last region, namely the adverbial region, is included to account for the wrap-up effect in the sentence. The results of the analysis are presented in Table 4.7:

Table 4.7 Region-based LMEM Analyses in Experiment 2

Fixed Effects

Region	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	+1.271	-1.271	6.352	+0.200	0.841

DAT	-26.219	+26.219	7.656	-3.425	0.0006***
ACC	+22.786	-22.786	7.889	+2.888	0.0039**
Verb	-6.480	+6.480	8.904	-0.728	0.467
Adv.	-0.849	+0.849	7.587	-0.112	0.911

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	7120	84.38	0	0.00	8461	91.98
DAT	13722.3	117.14	110.8	10.52	12543.0	112.00
ACC	11344.8	106.51	105.2	10.26	13396.5	115.74
Verb	15639.97	125.06	19.68	4.44	17143.35	130.93
Adv.	9888.03	99.44	59.05	7.69	12344.65	111.11

Table 4.7 demonstrates that dative objects are processed 26 milliseconds faster in DAT>ACC order compared to ACC>DAT order (t= -3.43, p = <0.001) and accusative objects are processed 23 milliseconds faster in ACC>DAT order (t = 2.888, p = <0.001). This indicates that first objects, dative or accusative, are mostly processed faster compared to their counterparts in the second-object position. This finding is in line with the results of Experiment 1.

Reading times of the other regions, namely the subject, verb and adverbial regions, do not differ significantly depending on the order of the objects, which suggests that the processing differences related to the object order is local within the object regions and do not significantly affect the processing of the other sentence regions in this dataset. The line chart in Figure 4.4 visualizes the regional reading time differences between the two object orders.

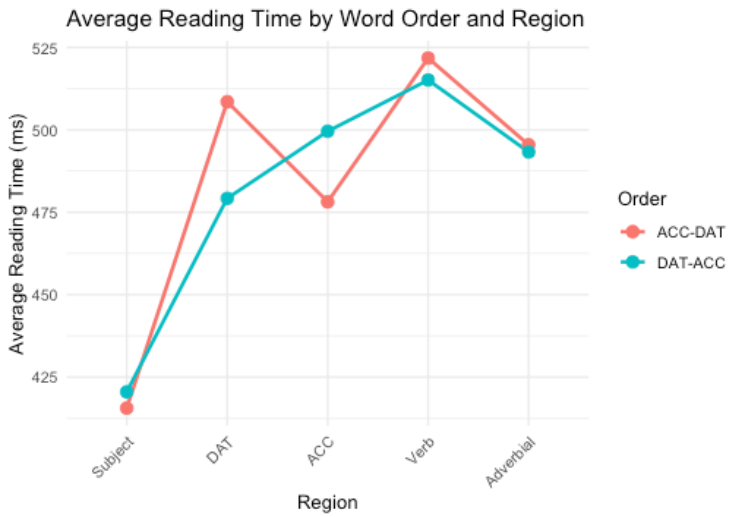

Figure 4.4 Line Chart of Regional Reading Time Differences between the Two Object Orders in Experiment 2

As can be seen in Figure 4.4, dative and accusative objects are read in different durations in the first and second regions. On the other hand, other three regions show very similar patterns regardless of the linearization of the objects.

4.1.2.2. Givenness Effect

The analyses in Section 4.1.2.1. collapse the givenness difference between the accusative and dative objects. However, this experiment is mainly conducted to analyze whether givenness of the objects has an influence on the reading time of ditransitive structures together with the word order. In other words, the question is whether the processing gets easier or not when the given objects come before the non-given objects. If so, another question of the experiment is whether the givenness effect changes according to the object type. There are two datasets

analyzed to answer these questions, and they are explained in the following subsections.

4.1.2.2.1. Given Dative Object Condition

In this condition, while the dative object is given, accusative object is non-given. Givenness of the objects is ensured through the context and markers as explained before. Example of this condition is given in (81).

(81)
Context: Bizim yandaki oturma odası çok soğuk oluyor. Özellikle de çıplak yere basınca çocuklarda karın ağrısına da sebep oluyor. O yüzden geçici bir çözüm buldum.

‘The living room next to ours gets very cold. Especially when children step on the bare floor, it may even cause stomach aches. Therefore, I found a temporary solution.’

a. Ben bir halı-yı o oda-ya yay-dı-m düzgünce.
I.NOM a carpet-ACC that room-DAT spread-PST-1SG neatly
'I neatly spread a carpet in that room.'

b. Ben o oda-ya bir halı-yı yay-dı-m düzgünce.
I.NOM that room-DAT a carpet-ACC spread-PST-1SG neatly
'I neatly spread a carpet in that room.'

LMEM analyses are conducted on the dataset with word order as the fixed effect and sentences and participants as random intercepts. Reading time of the regions and total sentence is the depended variable. The results of the analysis are reported in Table 4.8.

Table 4.8 LMEM Analyses of Given Dative Object Condition

Fixed Effects

Measure	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	+5.252	-5.252	9.534	+0.551	0.582
DAT	-43.65	+43.65	11.65	-3.748	0.0002***
ACC	+19.69	-19.69	12.55	+1.568	0.118
Verb	-4.637	+4.637	12.263	-0.378	0.706
Adv.	+5.068	-5.068	11.093	+0.457	0.648
Total RT	-56.42	+56.42	40.04	-1.409	0.160

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	6454.11	80.34	38.32	6.19	9153.22	95.67
DAT	9844.69	99.22	45.79	6.77	13898.86	117.89
ACC	9823	99.11	0	0.01	16250	127.46

Verb	14126	118.9	0	0.0	15713	125.4
Adv.	8720.2	93.38	108.9	10.44	12934.9	113.73
Total RT	171955	414.67	1364	36.94	165428	406.73

Table 4.8 illustrates that the only region that is sensitive to the object order change is the dative region which is the given object in this condition. Reading time of the dative region increases by 43.65 milliseconds when the given dative object is the second object in the sentence ($t = -3.748$, $p = 0.001$). Other regions such as the subject, accusative object, verb and adverbial regions show similar reading times and there is no statistically significant difference in these regions when non-given accusative and given dative objects alter their positions. The non-given accusative object is not processed significantly faster in the first-object position in this dataset as in previous findings. The findings suggest that non-given status of the accusative object may diminish the processing facilitation provided by the linear order.

4.1.2.2.2. Given Accusative Object Condition

Given accusative object condition is also analyzed using LMEMs to compare regional and total reading times in two object orders. Different than the previous condition, dative object is non-given and accusative object is given in this dataset. An example is given below.

(82)
Context: Bir tane halım var el dokuması. Zamanında çok para verip almıştım ama bir türlü kullanmak nasip olmadı. Artık zamanı geldi diye düşünüyorum.

‘I have a handmade carpet. I bought it for a lot of money a long time ago, but I never had the chance to use it. I think its time has finally come.’

a. Ben bir oda-ya o halı-yı yay-dı-m düzgünce.
I.NOM a room-DAT that carpet-ACC spread-PST-1SG neatly
'I neatly spread the carpet in a room.'

b. Ben o halı-yı bir oda-ya yay-dı-m düzgünce.
I.NOM that carpet-ACC a room-DAT spread-PST-1SG neatly
'I neatly spread the carpet in a room.'

Table 4.9 below presents the results of the LMEM analyses conducted to compare regional and total reading times in the given accusative condition.

Table 4.9 LMEM Analyses of Given Accusative Object Condition

Fixed Effects

Measure	**Estimate (DAT>ACC)**	**Estimate (ACC>DAT)**	**SE**	**t**	**p**
Subject	-3.803	+3.803	9.194	-0.414	0.679
DAT	-13.43	+13.43	10.56	-1.272	0.204
ACC	+27.024	-27.024	9.926	+2.722	0.0068**
Verb	-9.741	+9.741	13.679	-0.712	0.477
Adv.	-10.89	+10.89	10.77	-1.012	0.313
Total RT	-23.58	+23.58	39.04	-0.604	0.546

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	5746.66	75.81	29.45	5.43	8477.94	92.08
DAT	16690.2	129.19	394.7	19.87	11150.1	105.59
ACC	12590.3	112.21	368.5	19.20	9836.6	99.18
Verb	15882.3	126.02	745.8	27.31	18652.2	136.57
Adv.	10284	101.4	0	0.0	11466	107.1
Total RT	219417	468.42	4480	66.93	152726	390.80

Table 4.9 indicates that the order of the given accusative object matters because it creates difficulty when placed in the second-object position. The time spent to read the given accusative object in the second-object position is 27 milliseconds longer than in the first-object position ($t = 2.722$, $p = 0.00687$). On the other hand, dative object regions do not significantly differ in the first and second object positions. This finding supports the finding of the previous condition since in both conditions given objects are processed harder in the second-object position and the first-object position advantage appears to be moderated by the non-given status of the competing object. The reading times of the other regions, namely, subject, verb and adverbial regions and total reading time do not change significantly, which suggests that givenness of the objects influences the object regions rather than the whole sentence. This suggests that givenness effect is local and do not create a global effect for the sentence.

4.1.2.3. Position-Controlled Object Comparison

In this analysis, reading times of the dative and accusative objects in the same position are compared using LMEMs. The main goal is to discover whether the dative or accusative objects are processed faster in the first or second-object position. However, this was a follow-up analysis, and accusative and dative objects were not controlled for lexical properties such as word frequency and word length, since the experimental materials were not originally designed for this comparison. The results of the analysis are given in Table 4.10.

Table 4.10 LMEM Analysis of Same-position Object Comparison in Experiment 2

Fixed Effects

Position	**Estimate (DAT)**	**Estimate (ACC)**	**SE**	**t**	**p**
First	-22.05	+22.05	11.60	-1.902	0.058
Second	+1.534	-1.534	12.509	+0.123	0.902

Random Effects

Position	**Part. Var.**	**Part. SD**	**Sent. Var.**	**Sent. SD**	**Resid. Var.**	**Resid. SD**
First	10456.2	102.3	187.6	13.7	13856.3	117.7
Second	9449	97.2	0	0.0	15994	126.5

The results in Table 4.10 illustrate that dative and accusative objects are read in similar amounts of time in the first and second-object positions in Experiment 2.

There is no statistically significant difference between the two object types within the same position, which may suggest that these objects do not have a specific position where they are processed more easily. However, this should be considered a tentative conclusion due to the lexical differences like word frequency and word length between the dative and accusative objects used in the sentences.

4.1.2.4. Givenness Condition-Specific Comparison

Another follow-up analysis is conducted to observe whether there is any reading time difference between the same type of objects with different givenness statuses in the same position. In other words, reading times of the given and non-given objects in the first- and second-object positions are compared to isolate the givenness effect from the position effect. Table 4.11 below presents the LMEM results.

Table 4.11 LMEM Analyses of the Givenness Effect within Object Types

Fixed Effects

Object	Position	Estimate (Given vs Non-given)	SE	t	p
ACC	First	-24.26	11.14	-2.178	0.030*
ACC	Second	-13.64	11.83	-1.153	0.250
DAT	First	-22.63	11.23	-2.016	0.045*
DAT	Second	+0.75	11.18	+0.067	0.947

Random Effects

Object	Position	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
ACC	First	12030	109.7	0.0003	0.0056	12300	110.9
ACC	Second	10890.3	104.36	280.5	16.75	13573.1	116.50
DAT	First	12233.1	110.60	74.9	8.66	12664.6	112.54
DAT	Second	14047.0	118.5	187.6	13.7	12084.6	109.9

First-position objects whether accusative or dative are sensitive to the givenness effect as can be seen in Table 4.11. Given accusative objects are read 24 milliseconds faster in the first-object position compared to their non-given counterparts ($t = -2.18$, $p = 0.03$), and given dative objects are processed 23 milliseconds faster in the same position compared to the non-given dative objects ($t = -2.02$, $p = 0.045$). On the other hand, second-position objects are read in similar time spans whether they are given or non-given. This suggests that givenness of the objects is a stronger constraint in the first-object position compared to the second-object position in Experiment 2.

4.1.2.5. Discussion on Experiment 2: Givenness Effect

Based on English ditransitives, Bresnan et al. (2007) propose that there are some factors which affect the word order of ditransitive objects. One of these factors is named as givenness. Based on the classification of Prince (1981), givenness is taken as the givenness as saliency in this study and it can be described as the objects either mentioned in the previous context or present in the current context.

In Turkish, givenness can be expressed through discourse context and the use of demonstrative determiners like *bu* ‘this’, *şu* ‘that’ and *o* ‘that’ while non-given status can be accomplished through the indefinite article *bir* ‘a/an’ (Göksel &

Kerslake, 2004, Kornfilt, 1997). Turkish does not have a grammaticalized article system; speakers mostly rely on contextual cues and lexical markers to distinguish between given and new information. In Turkish, word order variation is strongly influenced by pragmatic factors such as definiteness and information structure (Erguvanlı, 1984). Given information is typically associated with topic positions, which often appear in sentence-initial positions.

In this study, given objects are mentioned in the previous context which is presented in the screen just before the experimental sentence and givenness of these objects is supported via the demonstrative *o* 'that' in the sentence. On the other hand, non-given objects are not referred in the context and used with indefinite marker *bir* 'a/an' in the sentence.

The principle called *Given-before-New* (Clark & Clark, 1977) claims that the given information is generally placed before the new information in the sentence. To test this assertion, there are production, comprehension and corpus studies conducted such as Brown et al. (2012), Clifton & Frazier (2004), Velnić & Anderssen (2021), Choi (2009), Anderssen et al. (2014). Most of these studies found that given objects are mostly produced before the new objects and given before new order is generally comprehended faster. Turkish is a language which has not been studied in terms of the givenness effect on ditransitive structures, and this study aims to investigate if givenness affects the processing of dative and accusative objects in the first and second object positions.

LMEM is applied to the results and given and non-given dative and accusative objects are compared across positions. The results indicate that although total reading time does not change based on the givenness properties of the objects, givenness does affect the reading times of the dative and accusative object regions. It is found that given dative objects are processed much faster in the first-object position compared to the second-object position. In addition, when the non-given dative objects are placed in the first-object position, the first-object position advantage of that object diminishes. In addition, given accusative objects are processed more easily in the initial position, whereas non-given accusative objects do not benefit from the first-object position advantage when they precede

given dative objects. The first position objects are always processed faster than the second-position objects across experiments in this study, but non-givenness of the dative and accusative objects reduces this first-object position advantage based on the findings of Experiment 2. Overall, the results suggest that given dative and accusative objects are processed more easily when they appear first, whereas non-given objects do not show the same advantage over their given counterparts.

A follow-up study is also conducted to compare given and non-given dative and accusative objects in the same position. When given and non-given dative objects are compared in the first-object position, there is a reading time difference between these objects. Similar difference is also observed for given and non-given accusative objects in the first-object position. Basically, given objects are processed faster in the initial position compared to their non-given objects in the same position. On the other hand, second-position objects do not seem to be influenced by the givenness effect, as similar reading times are observed for given and non-given objects in the second-object position. This may suggest that the first-object position is more sensitive to the givenness status of the objects, whereas the second-object position can accommodate both given and non-given objects with similar processing ease.

Overall, the results indicate that givenness plays a crucial role for dative and accusative objects in Turkish ditransitive structures. Given objects are generally processed faster in the first-object position, while non-given objects do not show the same advantage in that position. The findings suggest that there is a position asymmetry for the givenness effect.

The finding that given before new linear order affects the processing of dative and accusative objects positively is parallel with many processing studies. For example, Clifton and Frazier's speeded acceptability judgement test (2004) shows that given before new order does make some constructions easier to process.

Similary, Asami & Tomioka (2025) study discourse givenness related to the canonical order processing in Japanese. Their findings also support the view that given before new order makes a structure easier to process since noncanonical structures are processed in similar duration with canonical ones when supported with a given constituent at the beginning of the sentence. Similar context effect is also observed in Russian by Slioussar (2011). It is found that noncanonicality of the sentence does not create an important processing time difference as long as it is supported with given before new order.

Norwegian is another language which shows a given before new preference in comprehension based on Velnić & Anderssen (2021). Kizach and Balling's study (2013) also reveals that in Danish double object structures, given>new order is easier to process than the reversed order.

As most studies suggest, this study also found that given constituents are processed faster when placed before the non-given constituents in Turkish ditransitive structures. However, based on the findings of Experiment 2 in this study, it is not possible to claim that processing gets easier for the whole ditransitive sentence. It is only probable to suggest that this givenness effect is influential in the object regions, and it does not exceed beyond these regions in the sentence. Another very important finding of this study is that givenness effect is more vivid in the first object region in Turkish ditransitives rather than the second object region. This finding is a new one, so it can be studied in other languages to arrive at a more generalizable conclusion.

4.1.3. Experiment 3: Word Order and Syntactic Complexity Effect

In Experiment 3, the main goal is to observe whether total reading times and regional reading times change in relation to the object order and syntactic complexity of the dative and accusative objects. As mentioned in the methodology part, syntactic complexity is established through the number of words in the objects. Short objects include only two words: a determiner and a noun, whereas longer objects consist of five-word noun phrases with additional modifiers.

4.1.3.1. Overall Object Order Analysis (Syntactic Complexity Collapsed)

In this section, the overall dataset of Experiment 3 is analyzed and the syntactic complexity differences between the objects are collapsed. This analysis provides a picture of the general processing pattern of the dataset without considering the effect of syntactic complexity. The fixed effect is word order, and random intercepts are participants and sentences as in other experiments. Table 4.12 shows the LMEM results for the total reading time difference in Experiment 3.

Table 4.12 LMEM Analysis of Total Reading Time in Experiment 3

Fixed Effects

Effect	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Word Order	-22.79	+22.79	32.51	-0.701	0.483

Random Effects

Random Effect	Var.	SD
Part. (Intercept)	416315	645.2
Sent. (Intercept)	24222	155.6
Residual	469435	685.2

Table 4.12 shows that there is no significant total reading time difference between sentences with ACC>DAT and DAT>ACC object orders in Experiment 3. In other words, the dataset in Experiment 3 does not show a clear processing advantage for either object order when syntactic complexity is not taken into consideration.

Figure 4.5 is a boxplot illustrating the minimal reading time difference between two object orders in Experiment 3.

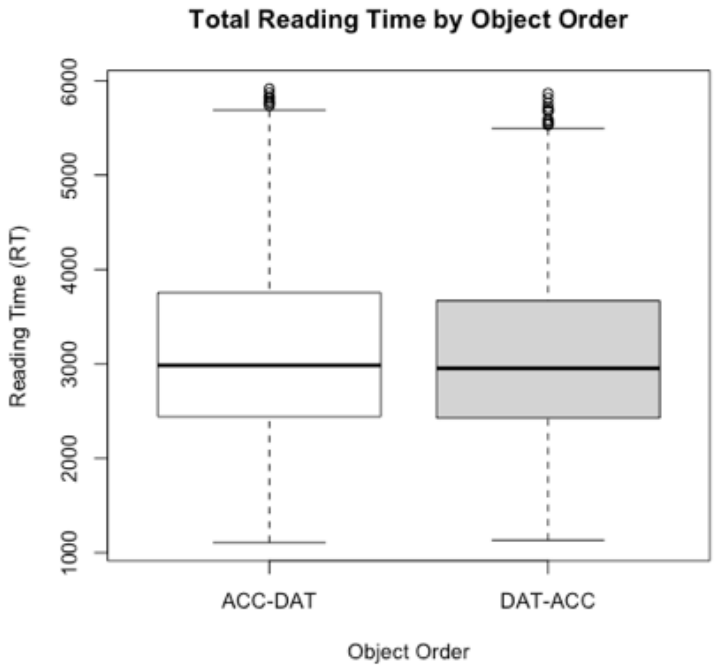

Figure 4.5 Boxplot of Total Reading Time Differences between the two Object Orders in Experiment 3

As can be observed in Figure 4.5, there is not a considerable total reading time difference between sentences with ACC>DAT and DAT>ACC orders in Experiment 3.

Regional analyses are also conducted using LMEMs in Experiment 3. There are five regions that are analyzed as in previous experiments. The last region is the adverbial region included to control for the wrap-up effect. The results of the analysis are presented in Table 4.13.

Table 4.13 Region-based LMEM Analyses in Experiment 3

Fixed Effects

Region	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	P
Subject	-1.209	+1.209	4.949	-0.244	0.807
DAT	-81.51	+81.51	30.13	-2.706	0.0068**
ACC	+79.068	-79.068	23.783	+3.325	0.0009***
Verb	+2.390	-2.390	7.437	+0.321	0.748
Adv.	-9.049	+9.049	6.006	-1.507	0.132

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	6401	80.01	0.79	0.89	10570	102.82
DAT	35020	187.14	2430	49.29	411748	641.68
ACC	21948	148.15	6395	79.97	254767	504.74
Verb	10121.6	100.61	238.3	15.44	24010.9	154.95

Adv.	9504	97.49	0	0.00	15964	126.35

Based on the results obtained from the LMEM analyses in Table 4.13, it can be said that dative and accusative object regions are sensitive to the object order. The dative object is read approximately 82 milliseconds faster in DAT>ACC order (t = -2.706, p = 0.007), and the accusative object is read 79 milliseconds faster in ACC>DAT order (t = +3.325, p = <0.001). This finding is in the same direction with Experiment 1 and 2 since it also reveals that objects in the first-object position are processed faster than the objects in the second-object position regardless of the case marking of the object. Other regions, namely subject, verb and adverbial regions do not show significant reading time difference, which implies that these regions are not strongly influenced by word order. It can be inferred that word order influence is limited to the object regions. Reading time distributions across the regions can be seen as a line chart in Figure 4.6.

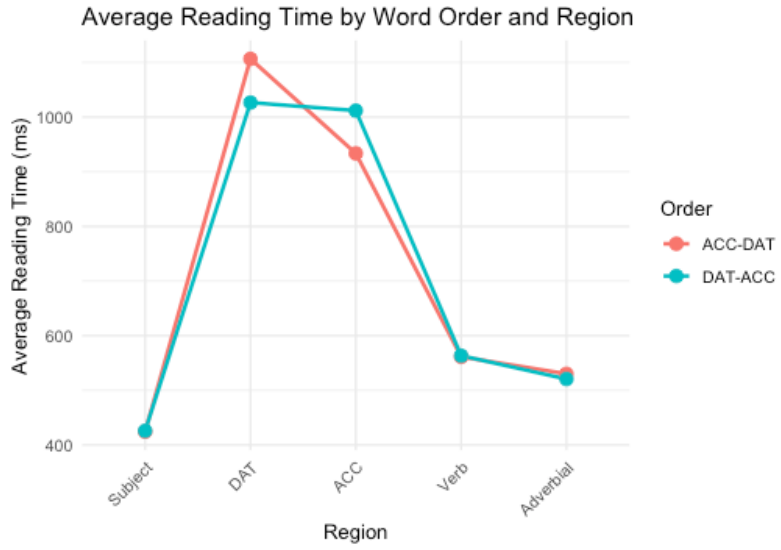

Figure 4.6 Line Chart of Regional Reading Time Differences between the Two Object Orders in Experiment 3

Figure 4.6 displays that subject, verb and adverbial regions show very similar reading times across object orders while dative and accusative object regions show a clear reading time difference.

4.1.3.2. Syntactic Complexity

In this part of the study, syntactic complexity difference between accusative and dative objects, operationalized through the number of words, is taken into consideration. Long objects, which are considered more complex, and short objects, which are considered simpler, are compared across two object orders. The aim is to discover whether the position of the longer object is effective on the processing of Turkish ditransitives.

4.1.3.2.1. Long Dative Object Condition

In this condition, the dative object is longer than the accusative object. Dative objects are composed of five words, whereas accusative objects consist of two. Dative objects are modified by adjectives or prepositional phrases to make them more complex than accusative objects. An example of the long dative condition is provided in (83).

(83)
Context: Dün annemin evini düzenledik tüm gün. Annem de tam bir istifçiymiş, neler çıktı evden bir bilsen. Onca eşyanın arasından en çok ilgimi çeken şu oldu.

‘Yesterday, we spent the whole day organizing my mother’s house. It turns out that she is a real hoarder; you would not believe the things we found in the house. Among all those belongings, this caught my attention the most.’

a. Ben gizli saklı köşe-de-ki bir kutu-ya bir mektub-u
I.NOM hidden secretly corner-LOC-REL a box-DAT a letter-ACC
koy-du-m düzgünce.
put-PST-1SG properly
‘I put a letter into a hidden box in the corner.’

b. Ben bir mektub-u gizli saklı köşe-de-ki bir kutu-ya
I.NOM a letter-ACC hidden secretly corner-LOC-REL a box-DAT
koy-du-m düzgünce.
put-PST-1SG properly
‘I put a letter into a hidden box in the corner properly.’

Regional reading times and total reading times of the experimental sentences are compared between conditions in which the long dative object appears in the first-object position and the second-object position. While the order of objects is the independent variable, reading time is the dependent variable. LMEM analyses are conducted and the results are reported in Table 4.14.

Table 4.14 LMEM Analyses of Long Dative Object Condition

Fixed Effects

Measure	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	+1.713	-1.713	7.078	+0.242	0.809
DAT	-37.995	+37.995	31.232	-1.217	0.224
ACC	+156.71	-156.71	15.73	+9.964	<0.001***
Verb	-7.728	+7.728	11.113	-0.695	0.487
Adv.	-12.007	+12.007	8.565	-1.402	0.161
Total RT	+96.39	-96.39	46.99	+2.051	0.0406*

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD

Subject	6091	78.05	0	0.00	10710	103.49
DAT	125034	353.6	25412	159.4	213540	462.1
ACC	27822	166.80	1378	37.12	57509	239.81
Verb	11304.4	106.32	448.3	21.17	26500.9	162.79
Adv.	10371.49	101.84	72.01	8.49	16119.05	126.96
Total RT	442474	665.2	28849	169.8	488197	698.7

As illustrated in Table 4.14, short accusative objects are processed much faster in the first-object position (Estimate = -156.71, t = 9.964, p = 0.001). On the other hand, reading time difference between the first- and second-object positions of the long dative object is not statistically significant (Estimate = 37.995, t = 1.217, p = 0.224). This suggests that increased syntactic complexity may override the processing advantage of the first-object position for dative objects. Similarly, subject, verb and adverbial regions do not show a reading time difference across the two object orders. Total reading time difference between ACC>DAT and DAT>ACC orders when the dative object is long is significant. When longer dative object is placed in the first object position, reading time for the whole sentence increases significantly (Estimate = +96.39, t = 2.051, p = 0.0406). The results in this condition propose that longer dative objects in the first-object position diminish the advantage associated with the first-object position and the processing difficulty extends to the whole sentence, which creates a global effect. The total reading time difference between object orders is displayed in Figure 4.7.

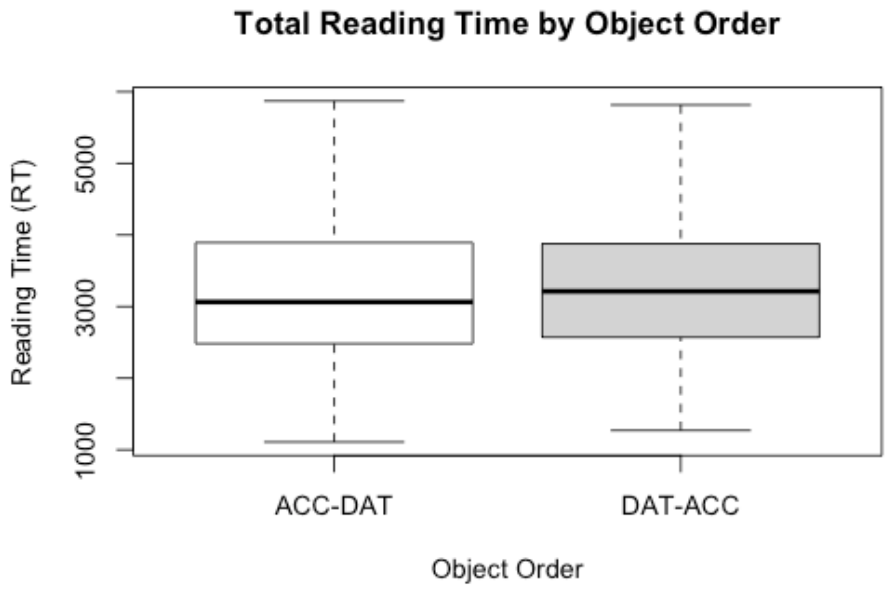

Figure 4.7 Boxplot of Total Reading Time Differences between the two Object Orders in Long Dative Condition

Figure 4.7 demonstrated the situation when dative object is syntactically more complex than the accusative object, reading time of the whole sentence in DAT>ACC object order is longer than ACC>DAT object order.

4.1.3.2.2. Long Accusative Object Condition

In this condition, there is a long accusative and a short dative object in the sentence. The example (84) provides illustrates long accusative condition.

(84)

Context: Ben hatıralara önem veririm. Bir şey kötü de olsa iyi de olsa ben yaşanmışlığına bakarım. Mesela ayrılık mektubu var bir tane, çöpe atamadığım. Bu önümdeki kutu tüm anılarımı barındırıyor benim. Bir tek o mektup ayrı yerde duruyormuş.

‘I value memories. Whether something is good or bad, I care about the fact that it was once lived through. For example, there is a breakup letter that I could never throw away. This box in front of me contains all my memories. Apparently, only that letter had been kept separately.’

a. Ben o kutu-ya o tatsız ve acımasız mektub-u
I.NOM that box-DAT that unpleasant and cruel letter-ACC
koy-du-m düzgünce.
put-PST-1SG properly
'I put that unpleasant and cruel letter into the box properly.'

b. Ben o tatsız ve acımasız mektub-u o kutu-ya
I.NOM that unpleasant and cruel letter-ACC that box-DAT
koy-du-m düzgünce.
put-PST-1SG properly
'I put that unpleasant and cruel letter into the box properly.'

The results of the LMEM analyses of the reading time difference across the two object orders are presented in Table 4.15 below.

Table 4.15 LMEM Analyses of Long Accusative Object Condition

Fixed Effects

Measure	**Estimate (DAT>ACC)**	**Estimate (ACC>DAT)**	**SE**	**t**	**p**
Subject	-3.083	+3.083	6.946	-0.444	0.657
DAT	-129.65	+129.65	17.90	-7.244	<0.001***
ACC	-3.671	+3.671	23.421	-0.157	0.875
Verb	+11.550	-11.550	9.666	+1.195	0.233
Adv.	-7.125	+7.125	8.401	-0.848	0.397

Total RT	-147.48	+147.48	42.05	-3.507	0.0004***

Random Effects

Measure	**Part. Var.**	**Part. SD**	**Sent. Var.**	**Sent. SD**	**Resid. Var.**	**Resid. SD**
Subject	6141.17	78.37	65.13	8.07	10428.10	102.12
DAT	33762.7	183.75	993.8	31.52	74759.6	273.42
ACC	82362	287.0	30916	175.8	118775	344.6
Verb	9448.17	97.20	5.23	2.29	20423.24	142.91
Adv.	8250	90.83	0	0.00	15629	125.02
Total RT	373797	611.4	29462	171.6	392577	626.6

Table 4.15 indicates that short dative objects are processed 129 milliseconds faster in the first-object position compared to the second-object position (t = -7.244, p = <0.001). Unlike the dative objects, longer accusative objects are processed in similar amounts of time in both orders. This finding is similar to the long dative condition where the position of the long object does not create a significant reading time difference. In other words, first-object position advantage diminishes when the first-position object is long and more complex. Other regions also do not display a significant reading time difference as in the previous condition. Total reading time differs statistically significantly depending on the order. When shorter dative object precedes the longer accusative object, total reading time of the sentence decreases by 147 milliseconds (t = -3.507, p =

<0.001). This finding suggests that the effect of syntactic complexity in relation to Turkish ditransitive word order is global rather than limited to the object regions as in the previous condition. Reading time difference between the two object orders is visualized in Figure 4.8.

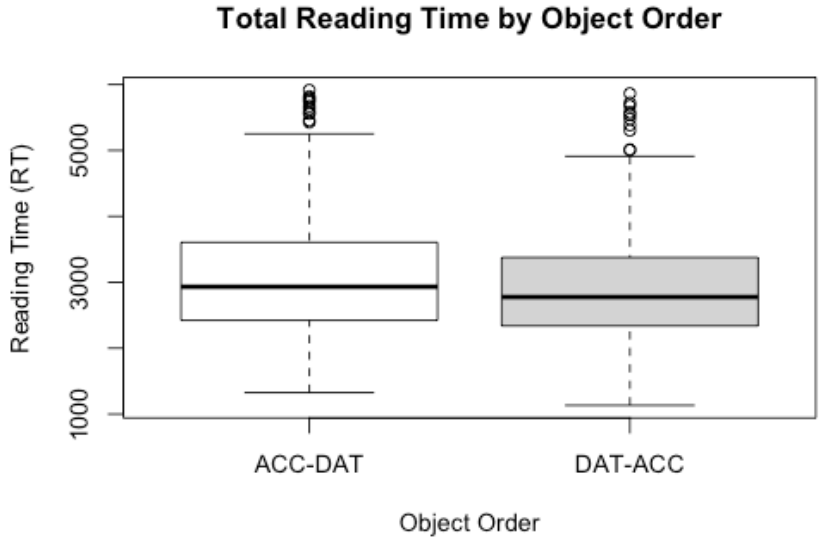

Figure 4.8 Boxplot of Total Reading Time Differences between the Two Object Orders in Long Accusative Condition

Figure 4.8 presents the significant time difference between ACC>DAT and DAT>ACC ordered ditransitive sentences when the accusative object is longer, and consequently more complex.

4.1.3.3. Position-Controlled Object Comparison

This follow-up analysis is conducted to compare dative and accusative objects within the same position in order to observe whether there is any processing difference between the two object types. LMEM analyses are conducted, and the results obtained are presented in Table 4.16.

Table 4.16 LMEM Analysis of Same-position Object Comparison in Experiment 3

Fixed Effects

Position	Estimate (DAT)	Estimate (ACC)	SE	t	p
First	+89.62	-89.62	27.80	+3.224	0.0012**
Second	+92.74	-92.74	26.67	+3.478	0.0005***

Random Effects

Position	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
First	26919	164.07	2608	51.07	349439	591.13
Second	29961	173.09	1869	43.24	321330	566.86

Table 4.16 shows that in both positions, dative objects require significantly longer reading times compared to accusative objects in Experiment 3. In the first-object position, dative objects are read approximately 90 milliseconds slower than accusative objects ($t = 3.224$, $p = 0.0012$). Similarly, in the second-object position, dative objects are processed approximately 93 milliseconds slower ($t = 3.478$, $p = 0.0005$). However, these findings should be interpreted cautiously because lexical differences between dative and accusative objects are not fully controlled. Dative objects in this dataset may coincidentally be longer or phonologically more complex than accusative objects.

4.1.3.4. Syntactic Complexity Condition-Specific Comparison

This follow-up analysis investigates the effect of syntactic complexity on object processing independently of object position. Similar to the analysis in Experiment 2, the main aim is to differentiate the effect of linear order from the effect of syntactic complexity. In the main analysis, short and long objects are compared across first- and second- object positions to examine the effect of syntactic complexity on processing. A follow-up analysis is initially intended to directly compare short and long versions of the same objects in first- and second-object positions. However, such a comparison causes a methodological problem, since longer objects are inherently expected to take longer reading times due to their greater lexical and structural complexity.

For this reason, the follow-up analysis is instead conducted as an interaction analysis, examining whether the effect of object complexity varies depending on the position of the object in the sentence. The results of the analysis are presented in Table 4.17.

Table 4.17 LMEM Analysis of the Difference in Complexity Effect across Object Positions

Fixed Effects

Object	First-Object Position (Long–Short)	Second-Object Position (Long–Short)	Complexity Difference (First–Second)	SE	T	p
DAT	+991.96	-902.60	+89.36	38.16	+2.342	0.019*
ACC	+817.83	-655.16	+162.67	30.39	+5.353	<0.001***

Random Effects

Object	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
DAT	62073	249.14	4390	66.26	164874	406.05
ACC	43452	208.45	8665	93.09	103762	322.12

Table 4.17 shows the difference in the effect of complexity of the accusative and dative objects between first- and second-object positions. The positive interaction estimates indicate that the processing cost associated with longer objects is greater in the first-object position than the second-object position.

The results indicate that the effect of complexity is significantly different across positions for both object types. For dative objects, the complexity effect is significantly larger when the object appears in the first-object position rather than in the second-object position (Estimate = +89.36, t = +2.34, p = 0.019). Similarly, for accusative objects, the difference is even bigger, with a significantly greater complexity effect in the first-object position compared to the second-object position (Estimate = +162.67, t = 5.35, p < 0.001).

These findings indicate that the processing cost associated with longer objects is significantly modulated by object position. The complexity effect is significantly greater when the object appears in the first-object position rather than when it appears in the second-object position.

4.1.3.5. Discussion on Experiment 3: Syntactic complexity/Weight Effect

It is reported by Bresnan et al. (2007) that syntactic complexity like givenness affects the processing of object orders in ditransitive constructions. In their study, it is pointed out that when syntactically more complex object is placed after the less complex one, the ditransitive sentence becomes easier to process at least in English. In addition, the end weight principle proposes that longer and more

complex constituents are placed and processed faster when placed near the end of the sentence (Szmrecsányi, 2004).

There are different studies which are conducted to test this end weight principle, producing noncompatible results. In some languages like English, Russian, Danish, it is found that short-before-long ordered sentences are more frequent, produced more and easier to comprehend (Arnold et al., 2000; Kizach, 2012; Kizach & Balling, 2013; Wasow, 1997). On the other hand, Japanese shows an opposite trend. In Japanese, longer constituents are placed earlier in the sentence (Hawkins, 1994; Yamashita & Chang, 2001). The difference between these languages is mostly explained by head direction of the language and it is stated that head-final languages show a mirror-image effect and place longer constituents first and shorter constituents later, following a long-before-short order.

In this study, Turkish, another head-final SOV language, is examined with respect to complexity difference between accusative and dative objects in ditransitive structures. It aims to determine whether the end weight principle or the mirror-image effect provides a better account of object ordering patterns in Turkish ditransitive sentences. Long dative and short dative objects and long accusative and short accusative objects are placed either in the first-object or in the second-object positions in Experiment 3. LMEM analyses are conducted for total reading time and regional reading time. It is found that when long dative object is placed in the first-object position before a short accusative object, its first-object position advantage reduces. On the other hand, short accusative object is processed easier in the first-object position compared to the second-object position. The whole sentence becomes harder to process when longer and more complex dative objects come before the shorter dative objects. This means that processing of the whole sentence gets more difficult when sentence has long-before-short order in long dative condition.

In the long accusative condition, there are parallel findings. First-object position advantage of the accusative object also diminishes when this object is placed to the initial object position in the sentence. However, short dative object is

processed significantly faster in the first-object position rather than in the second-object position. It is possible to assert that first-object position advantage is facilitated when the first object is shorter than the second object. Total reading time analysis is also affected by the order of objects. Reading time reduces significantly when the order is short-before-long, which may indicate that processing is easier in this order.

A follow-up interaction analysis is also conducted to understand whether the complexity effect differs in the first- and second-object positions for dative and accusative objects. In this analysis, object complexity is evaluated in interaction with word order. It is found that the reading time difference between long dative and short dative objects is 89 milliseconds longer in the DAT>ACC order. This suggests that complexity effect is stronger in first-object position for dative objects. Similarly, reading time difference of the long accusative and short accusative objects is 162 milliseconds longer in the first-object position. All in all, it can be inferred that the processing cost associated with syntactic complexity is greater when the long object occupies the first-object position.

The main analyses and the follow-up analyses indicate that the first-object position advantage is substantially reduced when the first object is syntactically complex, whereas it becomes much stronger when the first object is less complex. This pattern is compatible with the end weight principle described above. Based on these findings, it might be possible to suggest that Turkish ditransitive processing is compatible with the predictions of the end weight principle. On the other hand, Hawkins' account (1994) predicts a mirror-image effect in head-final languages, where longer constituents are expected to occur earlier rather than later. However, the findings of this study do not fully support this prediction for Turkish ditransitives. Instead, longer objects create greater processing costs when they appear in the first-object position, which is more compatible with a short-before-long tendency. This finding is in line with Jing et al. (2021), who show that head-final languages do not display a uniform pattern in the ordering of complex constituents. Therefore, the present results suggest that the relationship between syntactic complexity and word order in Turkish

cannot be explained solely by the typological distinction between head-initial and head-final languages. Rather, complexity effects should be evaluated together with language-specific structural properties and processing demands.

4.1.4. Experiment 4: Word Order and Animacy Effect

Experiment 4 is conducted to examine the effect of animacy difference between the objects on the processing of Turkish ditransitive object orders. There are two conditions in the experiment. In one condition, dative objects are animate, whereas accusative objects are inanimate. In the other condition, animacy of the objects is reversed. The main goal is to observe whether animate>inanimate order is processed easier than the inanimate>animate order.

In animacy analyses, LMEMs are employed. Word order is the fixed effect and sentences and participants are the random intercepts as in previous experiments. Givenness and syntactic complexity of the objects are controlled so that the observed effect can be explained with only animacy difference.

4.1.4.1. Overall Object Order Analysis (Animacy Collapsed)

The first analysis is conducted to investigate whether a general processing pattern exists in the whole dataset of Experiment 4. That is why animacy difference between the objects is collapsed in this analysis. Total reading times of the sentences with ACC>DAT and DAT>ACC order are compared using LMEMs, and the results obtained are reported in Table 4.18.

Table 4.18 LMEM Analysis of Total Reading Time in Experiment 4

Fixed Effects

Effect	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Word Order	+10.85	-10.85	28.17	+0.385	0.7

Random Effects

Random Effect	Var.	SD
Part. (Intercept)	169956	412.26
Sent. (Intercept)	1629	40.36
Residual	172485	415.31

Table 4.18 clearly shows that there is not a significant difference between the reading times of ACC>DAT and DAT>ACC ordered sentences (Estimate = 10.85, t = 0.385, p = 0.7). This suggests that one order is not necessarily easier than the other in this dataset. The boxplot in Figure 4.9 illustrates the reading time difference between sentences with these two object orders.

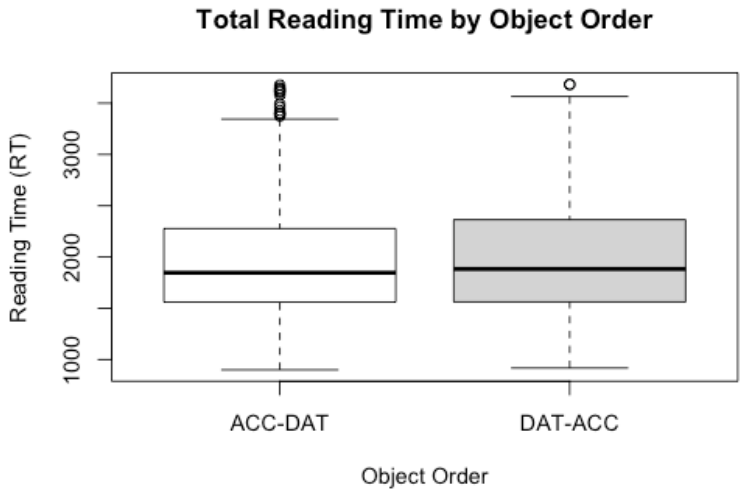

Figure 4.9 Boxplot of Total Reading Time Differences between the Two Object Orders in Experiment 4

Figure 4.9 shows that ACC>DAT and DAT>ACC ordered sentences are read in similar amounts of time in a boxplot.

In addition, LMEM analyses are conducted to observe regional time difference between sentences with the two object orders. Five regions, like the previous experiments, are analyzed. The last region, namely adverbial region, is included for the wrap-up effect. The results of the analysis are displayed in Table 4.19.

Table 4.19 Region-based LMEM Analyses in Experiment 4

Fixed Effects

Region	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	-4.732	+4.732	6.635	-0.713	0.476
DAT	-18.824	+18.824	8.167	-2.305	0.0215*
ACC	+35.10	-35.10	7.97	+4.403	<0.001***
Verb	-9.167	+9.167	8.293	-1.105	0.269
Adv.	-3.748	+3.748	7.642	-0.490	0.624

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	5923	76.96	0	0.00	9348	96.68
DAT	14101.6	118.75	320.8	17.91	14535.9	120.56

ACC	11409.7	106.82	176.6	13.29	13657.1	116.86
Verb	12072.1	109.87	202.4	14.23	14645.2	121.02
Adv.	9377.97	96.84	13.01	3.61	12616.14	112.32

Table 4.19 indicates that dative object is read 18 milliseconds faster in the first-object position compared to the second-object position (t = -2.305, p = 0.0215). Similarly, accusative object is also read 35 milliseconds faster in the first-object position (t = 4.403, p = <0.001). Both results are statistically significant, and they are parallel with the results of the previous experiments. Across the main analyses of overall datasets, it is found that the first-position objects are processed faster than their counterparts in the second-object position. In addition, no region other than the two object regions is influenced by the order of objects in four experiments. This finding may lead to the conclusion that object order in Turkish ditransitive structures does not strongly affect ditransitive processing globally, but it is rather limited to the object regions. Line chart in Figure 4.10 presents the reading times of all regions in two object orders.

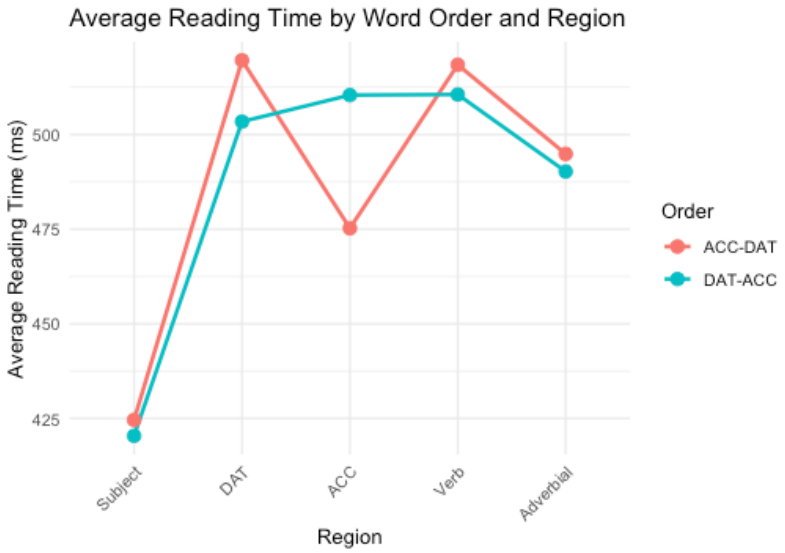

Figure 4.10 Line Chart of Regional Reading Time Differences between the Two Object Orders in Experiment 4

As can be seen in Figure 4.10, time difference in accusative region is very pronounced. Dative region also displays a modest but significant difference between two orders. Other three regions do not show a strong difference between the object orders.

4.1.4.2. Animacy

LMEM analyses are mainly conducted to question whether animacy difference between the accusative and dative objects influence the processing of Turkish ditransitive object orders. There are two conditions: in one condition, there are animate dative and inanimate accusative objects and in the other condition, the animacy pattern is reversed. The results of the two conditions are reported under two subsections.

4.1.4.2.1. Animate Dative Object Condition

In this condition, dative objects are animate while accusative objects are inanimate. An example of this condition is provided below.

(85)
Context: Uzun zamandır üzerinde çok düşündüğüm ama bir türlü çözüm yolu bulamadığım bir konu var. Bu konu yüzünden geceleri gözüme uyku girmez oldu. Ben de yardım almaya karar verdim. Bu alanda çalışan tanıdığım bir hoca var, ona sormaya karar verdim. Dün yanına gittim.

'For a long time, there has been an issue that I have been thinking about a lot but could not find a solution to. Because of this issue, I have not been able to sleep at night. So, I decided to get help. I know a professor working in this field, and I decided to ask them. Yesterday, I went to see them.'

a. Ben o hoca-ya o konu-yu danış-tı-m düzgünce.
I.NOM that professor-DAT that issue-ACC consult-PST-1SG thoroughly
'I discussed that issue with that professor thoroughly'

b. Ben o konu-yu o hoca-ya danış-tı-m düzgünce.
I.NOM that issue-ACC that professor-DAT consult-PST-1SG thoroughly
'I discussed that issue with that professor thoroughly.'

LMEM analyses compare reading times across regions as well as total reading time across ACC>DAT and DAT>ACC orders. Object order is the fixed effect and sentences and participants are random intercepts in this analysis. The LMEM results of the analysis are presented in Table 4.20.

Table 4.20 LMEM Analyses of Animate Dative Object Condition

Fixed Effects

Measure	**Estimate (DAT>ACC)**	**Estimate (ACC>DAT)**	**SE**	**t**	**p**
Subject	-23.844	+23.844	9.557	-2.495	0.0131*
DAT	-33.10	+33.10	11.94	-2.773	0.0059**
ACC	+40.201	-40.201	12.714	+3.162	0.0017**
Verb	-10.762	+10.762	12.808	-0.840	0.401
Adv.	-2.663	+2.663	11.691	-0.228	0.820
Total RT	-47.57	+47.57	43.94	-1.082	0.280

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	5770	75.96	0	0.00	8871	94.19
DAT	14318.24	119.66	4.85	2.20	14194.94	119.14
ACC	9957	99.79	163	12.77	16070	126.77
Verb	11747.9	108.39	391.3	19.78	16279.6	127.59
Adv.	9408.21	97.00	95.36	9.77	13455.82	116.00
Total RT	159609.9	399.51	270.3	16.44	193499.7	439.89

As shown in Table 4.20, the following three regions show statistically significant differences: the subject region (Estimate = -22.844, t = -2.495, p = 0.013), the dative object region (Estimate = -33.10, t = -2.773, p = 0.006), and the accusative object region (Estimate = 40.201, t = +3.162, p = 0.002). The difference in the subject region may be coincidental considering that it has relatively small magnitude. Also, subject is the first argument encountered in these sentences. Therefore, it is not likely that reading time of the subject is affected by the order of the objects which are placed after it. On the other hand, both dative and accusative objects are read faster in the first-object position regardless of their animacy status. This means that the use of inanimate accusative objects does not diminish its first-object position advantage. Other regions and total reading time do not change significantly across the two object orders. These findings suggest that inanimate ACC > animate DAT ordering does not create additional processing difficulty in this condition.

4.1.4.2.2. Animate Accusative Object Condition

The dataset in the animate accusative condition is also analyzed using LMEMs. In this condition, dative object is inanimate, whereas accusative object is animate. An example to this condition is given in (86).

(86)
Context: Dün bizim iş yerinde bir hırsızlık girişimi oldu. Bir elinde silahla orta boylu kumral bir adam içeriye daldı ve bütün herkesi tehdit etti. O sırada arkadaşlardan biri adamı etkisiz hale getirdi. Hemen adamı odamdaki şu masanın yanına götürdük ve ben koşup bir halat getirdim.

'Yesterday, there was an attempted robbery at our workplace. A medium-height, brown-haired man holding a gun burst inside and threatened everyone. At that moment, one of my colleagues neutralized the man. We immediately took him next to the table in my office, and I ran to get a rope.'

a. Ben o masa-ya o adam-ı bağla-dı-m kolayca.
I.NOM that table-DAT that man-ACC tie-PST-1SG easily
'I tied that man to that table easily.'

b. Ben o adam-ı o masa-ya bağla-dı-m kolayca.
I.NOM that man-ACC that table-DAT tie-PST-1SG easily
'I tied that man to that table easily.'

LMEM analyses were conducted with object order as the fixed effect, participant and sentence as random intercepts, and reading time as the dependent variable. The results of the analysis on the animate accusative condition are reported in Table 4.21.

Table 4.21 LMEM Analyses of Animate Accusative Object Condition

Fixed Effects

Measure	Estimate (DAT>ACC)	Estimate (ACC>DAT)	SE	t	p
Subject	-1.73	+1.73	10.13	-0.171	0.864
DAT	-18.15	+18.15	12.42	-1.462	0.144
ACC	+37.54	-37.54	12.75	+2.943	0.0033**
Verb	+7.818	-7.818	19.650	+0.398	0.691
Adv.	+0.807	-0.807	15.253	+0.053	0.958
Total RT	+55.01	-55.01	40.41	+1.361	0.174

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	22781	150.9	0	0.0	23867	154.5
DAT	36581	191.26	192	13.86	35847	189.33
ACC	33335.4	182.58	475.6	21.81	37825.9	194.49

Verb	46531.6	215.71	117.2	10.82	89795.6	299.66
Adv.	37508.6	193.67	292.2	17.09	54100.0	232.59
Total RT	150526	387.98	1343	36.64	162457	403.06

Based on Table 4.21, it is possible argue that only the accusative region in animate accusative condition is sensitive to the order of objects. When the animate accusative is placed in the first-object position, reading time decreases by 37 milliseconds compared to the second-object position ($t = 2.943$, $p = 0.003$). On the other hand, other regions display similar reading times in both orders.

The nonsignificant finding in the dative region may indicate a limited animacy effect on the processing of this specific region, considering that the first-object position advantage observed in previous experiments does not reach statistical significance in this condition. However, this finding alone is not sufficient to claim that animacy strongly influences the processing of Turkish ditransitive structures.

4.1.4.3. Position-Controlled Object Comparison

In Experiment 4, another additional analysis is conducted comparing accusative and dative objects within the same object position. The aim of this analysis is to examine potential differences in the processing between object types while controlling for position effects. However, this analysis is conducted as follow-up and is not part of the initial experimental design. Therefore, the phonological and lexical properties of the objects are not systematically controlled, and the results should be interpreted with caution. The results of the analysis are reported in Table 4.22 below.

Table 4.22 LMEM Analysis of Same-position Object Comparison in Experiment 4

Fixed Effects

Position	Estimate (DAT)	Estimate (ACC)	SE	T	p
First	+24.375	-24.375	7.792	+3.128	0.0018**
Second	+8.679	-8.679	8.191	+1.060	0.290

Random Effects

Position	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
First	12737.6	112.86	148.6	12.19	13141.4	114.64
Second	13492.8	116.16	391.8	19.79	14489.1	120.37

As shown in Table 4.22, the dative object is processed 24 milliseconds slower than the accusative object in the first-object position (t = 3.128, p = 0.002). However, there is no considerable difference between the reading times of dative and accusative objects in the second-object position. Considering that the same analysis conducted across the four experiments did not reveal consistent results, it is highly probable that lexical differences between accusative and dative objects obscured the observation of a clear positional effect.

4.1.4.4. Animacy Condition-Specific Comparison

Animacy effect is compared in the same position with the same type of objects in this follow-up analysis. Animate and inanimate dative objects are compared in

the first- and second-object positions separately. Same analyses are also conducted for animate and inanimate accusative objects. LMEM analyses are conducted, and results are presented in Table 4.23.

Table 4.23 LMEM Analyses of the Animacy Effect within Object Types

Fixed Effects

Object	Position	Estimate (Animate vs Inanimate)	SE	T	p
ACC	First	-15.762	14.173	-1.112	0.346
ACC	Second	-23.421	21.258	-1.102	0.352
DAT	First	+13.004	23.174	+0.561	0.608
DAT	Second	+38.946	11.863	+3.283	0.0396*

Random Effects

Object	Position	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
ACC	First	11905	109.11	124	11.13	11227	105.96
ACC	Second	11831.4	108.77	444.7	21.09	14215.5	119.23
DAT	First	12446.3	111.56	563.8	23.74	14982.7	112.40

DAT	Second	15434.6	124.24	7.36	2.71	13536.4	116.35

The results in Table 4.23 suggest that animacy has no significant effect on the processing of dative objects in the first-object position or on accusative objects in either position. However, an animacy effect is observed for dative objects in the second-object position, where animate dative objects are processed 39 milliseconds slower than inanimate dative objects ($t = 3.283$, $p = 0.040$). Nevertheless, considering the generally weak and inconsistent findings across the experiment, this isolated finding is not sufficient to support a strong claim for a direct animacy effect in Turkish ditransitive processing.

4.1.4.5. Discussion on Experiment 4: Animacy Effect

Bresnan et al. (2007) proposes that animacy is another factor which affects the processing and production of ditransitive structures in English. Animacy of a noun is a property which makes that easier to conceptualize and prominent and more prominent constituents in a sentence are mostly placed before the less prominent ones. For example, subjects are generally animate and more salient members and typological studies have shown that subjects generally precede the objects which are frequently inanimate and less prominent in the sentence (Lamers & Swart, 2012; Primus, 2012).

The role of animacy in the ordering of dative and accusative objects has been widely discussed in the literature. Several studies suggest that animacy influences object ordering, with more animate constituents tending to appear in more prominent positions (Kempen & Harbusch, 2004; Haspelmath, 2015; Velnić, 2018). However, other studies report that animacy does not play a significant role in determining the order of ditransitive objects (Thuilier et al., 2021), or that its effect is only limited or moderate (Bazhukov et al., 2021). Taken together, these findings indicate that the influence of animacy may vary across languages and structural configurations. In this respect, Turkish ditransitive constructions provide a valuable testing ground for further investigation of the role of animacy in object ordering.

Unlike some languages, animacy is not grammatically encoded in Turkish through morphological or syntactic marking. Instead, it is inferred from lexical meaning.

In this study, animacy is taken as a binary category as in animate and inanimate for the purposes of the analysis. The study investigates whether animate before inanimate order is processed easier than the reversed order. The study also questions whether animacy effect changes depending on the type of the object in Turkish ditransitive sentences. To this end, animate objects are compared across the first- and second-object positions, and the same comparison is conducted for inanimate objects. However, the results do not reveal a consistent animacy effect. as explained in the previous section. When dative objects are animate, they are processed significantly faster in the earlier position. However, this processing facilitation may be attributed either to the animacy of the dative objects or to the first-object position advantage. A similar pattern is observed for inanimate accusative objects, and they are also processed significantly faster in the first-object position. This suggests that this is a first-object position advantage observed in other data sets. In the total reading time analysis, there is no substantial difference in the sentences in which animate dative objects follow inanimate accusative objects. The same is also observed for the sentences in which inanimate accusative objects follow animate dative objects. The second condition is the animate accusative condition. In this condition, dative objects are inanimate while accusative objects are animate. It is found that animate accusative objects are significantly processed faster in the initial position, but inanimate dative objects are not. This may indicate a potential animacy effect since the first-object position advantage of the dative object is decreased, however, the lack of consistency across conditions weakens this interpretation. Thus, even if there is a possible animacy effect in Turkish ditransitive structures, this effect is less robust compared to givenness or syntactic complexity effects.

To separate the order and animacy effects, a follow-up study is also conducted comparing animate and inanimate objects of the same type in the same position. The results show that animacy does not consistently lead to differences in reading

times in both positions. A statistically significant effect is observed only for inanimate dative objects in the second-object position, which are read faster than their animate counterparts. However, given that this effect is marginal, it should be interpreted with caution.

All in all, it can be said that animacy plays a limited role in the processing of Turkish ditransitive constructions sampled in the study. When compared with the other factors such as givenness and syntactic complexity, the influence of animacy seems to be considerably weaker. On the other hand, more controlled comparisons across these factors would be necessary to draw stronger conclusions about their relative contributions.

The limited effects of animacy are unlikely to be attributable to insufficient statistical power, as the sample size substantially exceeded the estimated minimum requirement. Rather, these findings support the view that animacy constitutes a relatively weak cue in Turkish ditransitive processing in contrast to the factors of givenness and syntactic complexity.

As stated earlier, the animacy effect is not common in some languages. For example, Thuilier et al. (2021) report that animacy is not an influential factor in the object orders in French ditransitives. The corpus analysis of Bazhukov et al. (2021) indicates that animacy effect is moderate in Russian ditransitives in contrast to other factors such as length and syntactic depth of objects.

Turkish is examined related to animacy before (Demiral et al., 2008). Subject-preference is studied in Turkish sentences with an initial ambiguous argument. The results show that participants mostly interpret the first noun phrase in the sentence as the subject even though that phrase is possibly interpreted as the object of the sentence. Furthermore, they find that even though the initial noun phrase is inanimate, subject analysis is still adopted by the participants and when realized that the first inanimate noun phrase is an object with the help of the verb's markings, a reanalysis is required, which causes increase in the processing difficulty. This shows that animacy is a not a very strong constraint which can suppress the subject-preference even though subjects are mostly animate in

various languages. This suggests that animacy has a weaker influence on other Turkish structures, too.

On the other hand, Kahraman et al. (2010) and Kahraman (2013) report that animacy status of the dative objects influences object ordering in Turkish ditransitive structures, particularly when the animate dative object functions as the possessor or recipient. Although their findings suggest that animacy is relevant to constituent ordering in Turkish ditransitives, the present study did not reveal a strong or consistent effect of animacy on the processing of the two object orders.

The relatively limited effect of animacy on ditransitive object ordering in this study does not necessarily mean that animacy is not important in Turkish sentence processing. A psycholinguistic study conducted by Uzunca and Akal (2023) proposes that the role of animacy may be more important in grammatical function assignment than in directly determining constituent order. Therefore, animacy in Turkish may have a more subtle effect on the organization of grammatical relations during sentence production, even if its effect on object ordering preferences remains relatively weak.

The limited effect of animacy observed in Experiment 4 may be explained via a usage-based framework. Turkish does not encode animacy grammatically through morphological or syntactic markers, and therefore, animacy cannot be categorized as a consistent cue in the input. Usage-based accounts argue that processing is shaped by the distributional properties of the input, such that frequently encountered and structurally reliable patterns become stronger predictors during comprehension (Ibbotson, 2013). Since animacy does not systematically determine argument structure or word order in Turkish, it does not directly influence the distributional patterns and consequently has only a limited impact on processing. On the contrary, case markers are more reliable and consistently available cues in Turkish, and they might develop stronger representations due to their frequency and consistency in the input. That is why case markers may be playing a more prominent role than animacy in Turkish sentence processing. This pattern follows a parallel direction with approaches

that link speakers' production differences, distributional patterns and comprehension processes.

4.2. GENERAL DISCUSSION

In this section, the findings are discussed in detail in relation to the existing findings on ditransitive sentences. The main pattern observed across the experiments such as the first-object position advantage is explained based on incremental sentence processing. In addition, the factors that are studied in the experiments are evaluated in relation to the PDC account by MacDonald (2013). Across the experiments, significant effects were primarily observed in the object regions where the experimental manipulations were introduced, whereas the subject, verb, adverbial, and, in some cases, total reading time measures frequently yielded non-significant results. Given that the sample size substantially exceeded the estimated minimum requirement according to the a priori power analysis, these null findings are unlikely to be attributable to insufficient statistical power. Rather, they suggest that the effects of the manipulated factors are primarily localized to the object constituents instead of producing uniform changes across the entire sentence.

4.2.1. First-object Position Advantage

Across four experiments, it is consistently found that the object placed as the first object in the sentences, whether it is accusative or dative, is processed faster than the second-position object. This finding suggests that there is a clear processing advantage of the first-object position in the sentence, and this advantage cannot be explained with case marking or object-specific properties.

There is no direct well-established effect in the literature that explains this first-object position advantage. That is why it calls for an explanatory account. It might be possible to offer an explanation to this pattern from incremental sentence processing account.

Incremental sentence processing is accepted almost by all the models of sentence processing (Ferreira & Çokal, 2016). Lee and Watson (2012) explain

incremental sentence processing as incorporation of every coming word into the structure without waiting for the end of the sentence. It is claimed that people regularly update their expectations about what is coming next in the sentence and its syntactic representation. That is why some sentences with ambiguous meaning cause extra processing time where the structure unfolds, which is generally explained by garden-path model. Garden-path model takes only syntactic information for the initial interpretation and claims that there are two universal syntactic principles which lead human processor to the simplest possible interpretation at the beginning. One is the Minimal Attachment Principle and the other is the Late Closure Principle. Minimal Attachment Principle can be explained as the tendency of the processor to choose a structure with a smaller number of nodes. This syntactic principle may provide one possible explanation for the finding that first-object position in ditransitive structures is processed faster than the second.

Ditransitive structures contain more nodes compared to monotransitive structures. A sentence with only one object is a simple sentence. It may be the case that when the human processor encounters an object (marked with accusative or dative) after the subject, it expects a verb after that object, which continues and probably finishes that sentence. In Turkish, monotransitive sentences with accusative or dative objects are exemplified in (87) and (88) below:

(87) Ben kitab-ı oku-du-m.
I.NOM book-ACC read-PST-1SG
'I read the book.'

(88) Ben kütüphane-ye git-ti-m.
I.NOM library-DAT go-PST-1SG
'I went to the library.'

There are also sentences in which these two objects co-occur, as in the ditransitive structures in (89). Since ditransitive structures contain a more complex syntactic representation with additional nodes, expecting a ditransitive

structure immediately after encountering the first object goes against the Minimal Attachment Principle.

(89) Ben kitab-ı kütüphane-ye bırak-tı-m.
I.NOM book-ACC library-DAT leave-PST-1SG
'I left the book at the library.'

One possible explanation is that after encountering the first object, the processor initially constructs a monotransitive structure. However, processing difficulty emerges when the second object is encountered, since the processor needs to revise the initially constructed structure into a ditransitive one. This may explain why second-position objects take longer time process as reported in the study. This type of reanalysis difficulty is generally studied in relation to ambiguous sentences such as (90) below.

(90) While Mary bathed the baby played in the crib.

(Ferreira & Çokal, 2016: 4)

In (90), the processor experiences processing difficulty at the word *played* because it first builds a simple sentence structure depending on the Minimal Attachment Principle. However, the verb *played* causes a problem because it does not fit in this simple sentence structure. The processor initiates reanalysis and revises the initially constructed structure, and this is why it takes longer to process the word *played* in this sentence. Similar to this type of ambiguous sentence structure, the present study suggests that the processor initiates reanalysis at the second object in Turkish ditransitive sentences. Ferreira and Çokal (2016) also state that the ease of reanalysis depends on the lexical and grammatical information provided by the incoming word. If the alternative structure can be more easily inferred from the word that disrupts the initial interpretation, processing time is relatively shorter. However, they also note that reanalysis may sometimes fail, leading to persistent misinterpretation. This is more likely when the initial interpretation is semantically compelling or when the alternative structure is relatively rare. Such cases are not observed in the present

study, as the processing difficulty does not persist into the verb and adverbial regions.

Models like Garden Path Model are serial models in nature, which only build one structure based on the grammatical properties at the beginning of the sentence. There are also parallel models which claim that the human sentence processor activates all the possible grammatical interpretations based on the frequency of these structures at the beginning of the sentence. More frequent structures are assumed to be prioritized over less frequent alternatives, leading the processor to rank possible interpretations based on their likelihood. For example, Pickering and Gompel (2006) state that verbs are frequently used as transitive rather than intransitive, so the processor mostly prefers a transitive interpretation at first even though that specific verb is generally used intransitively.

In the present study, when the processor encounters the subject and the first object, it may initially favor a monotransitive structure, since these structures are more frequent in Turkish. However, upon encountering a second object, this initial analysis must be revised into a ditransitive structure. This shift from a more frequent to a less frequent structural interpretation may further contribute to the increased processing cost observed at the second object position. Thus, it is possible to explain the findings in this study with either serial or parallel processing accounts. The comparison of these two models is the topic of another study.

Previous research on word processing has reported findings that are consistent with the results of the present study. As an example, Pimentel et al. (2021) question why languages tend to place unclear signals to the beginning of the words. Their findings show that cognitive mechanism allocates greater attention to the initial segments in a word or sentence and prioritize the processing of the beginnings. This is grounded in incremental word processing, where listeners or readers use initial information as a basis to update their expectations about the rest of the sentence.

In the context of Turkish ditransitive structures, this suggests that the first-object position may serve an important role for building the sentence's structure.

In addition, Pimentel et al. (2021) discuss a surprisal effect which is more active at the beginning of the sentence. People are more open to a surprise at the beginning of the sentence because they have minimal prior contextual constraints and they can allocate all their attention to the initial constituent. In this study, the first object may be the point at which sentence structure begins to be built. On the other hand, cognitive load is heavier when participants reach the second object. Consequently, the increased cognitive load observed at the second object may stem from the necessity to integrate new information into a pre-established structure or to resolve the structural ambiguity initiated by the first object. In line with this view, King and Wedel (2020) argue that the lexicon is shaped for communicative efficiency and less-probable words exhibit earlier uniqueness points to reduce the competing interpretations faster. In a sentence context, if the human processor prematurely identifies a uniqueness point at the first object and interprets it as a simpler monotransitive structure, reading the second object later may cause a reanalysis cost like a garden-path effect. The longer reading time at the second object, therefore, may represent the cognitive effort required to resolve the structural ambiguity and the shift from a high-probability (monotransitive) to a lower-probability (ditransitive) representation.

The argument that processor starts predicting the rest of the sentence before seeing the verb in verb final languages is tested by Pappert and Pechmann (2012). They conduct a cross-modal sentence completion experiment and a cross-modal naming experiment to understand the effects of case marking and prosody on the prediction of the upcoming structure in German ditransitive structures. Their study shows that case marking but not prosody shapes the expectations regarding the upcoming argument structure. When the participants see a dative object at the beginning, they have less difficulty building a ditransitive structure compared to an accusative object. This means that dative object provides a stronger argument-specific cue regarding the structure of the sentence in German ditransitives. In contrast to their findings, this study's findings indicate

that accusative and dative objects do not differ in terms of their capability of providing an argument-specific cue in Turkish. On the other hand, both objects probably indicate a structure with one object rather than two objects in Turkish. Thus, it might be said that accusative and dative objects in Turkish provide an opportunity of early prediction of a monotransitive structure, but this opportunity turns into a disadvantage when the structure is ditransitive. This may stem from cross-linguistic differences in the availability and frequency of ditransitive structures. In line with the findings of Pappert and Pechmann (2012), it might be the case that German ditransitive structures are more frequent and generally used with DAT>ACC structure, while Turkish ditransitive structures are rare and do not have a preference between ACC>DAT and DAT>ACC orders, which is actually another finding discovered in this dissertation.

It should be noted that the incremental processing account presented here is proposed only as one possible explanation for the observed processing pattern. The present study was not designed to directly test this mechanism, as it did not include a comparison with monotransitive structures or other control conditions that would allow the proposed reanalysis process to be examined directly. Future studies comparing monotransitive and ditransitive constructions may provide more direct evidence for this account.

To sum up, the finding that the second object in Turkish ditransitives is processed more slowly than the first object may stem from the fact that the processor first builds a construction with only one object. However, further studies comparing earlier and later positions of dative and accusative objects, both in transitive and ditransitive constructions, are needed to draw more definitive conclusions on this issue.

4.2.2. Findings on the PDC Account

The PDC account argues that speakers' production preferences shape the distribution of linguistic forms in a language and people adapt to these distributions during processing (MacDonald, 2013). Based on this framework, it is suggested that the factors that are systematically influential in production lead

to more consistent distributional patterns, and consequently they are more readily utilized during comprehension. Based on the experiments, it can be argued that not all factors in this study equally contribute to processing because they probably differ in their role in production.

In the Experiment 1, there is no processing advantage observed either for DAT>ACC or ACC>DAT orders. This study does not test production of the objects in Turkish ditransitives or no corpus study has been encountered so far which touches upon the object order, but there are some claims in favor of the ACC>DAT order in Turkish ditransitive structures (Kornfilt, 1997; Kural, 1992; Underhill, 1972). Within the framework of PDC, it can be said that even if there is a broader distributional tendency favoring one order over the other in Turkish ditransitives, this tendency may not be sufficiently strong or consistent enough to shape online comprehension under the current experimental conditions. In contrast, there is a processing facilitation for the first-object position over the second-object position, regardless of its case marking. This observed facilitation appears to be more closely related to incremental sentence processing rather than to a distributional preference for a type of object order.

When the results of the Experiment 2 are discussed related to the PDC framework (MacDonald, 2013), it can be said that the production bias of *Given-before-New* is reflected in the processing of ditransitive object order. It has been widely shown that given entities are generally placed before new entities (Gundel, 1988; Arnold et al., 2000) and this tendency leads to the consistent distributional patterns in the input. It also complies with broader production preferences, such as the tendency to place more accessible or easier-to-plan material earlier in the sentence. Since comprehenders are sensitive to these distributional patterns as discussed in PDC account, they are prone to process given information more efficiently when placed earlier. The fact that non-given objects reduced the first-object position advantage further supports this account and suggests that processing benefit associated with early position is not absolute but is modulated by information structure.

The findings of Experiment 3 demonstrate a clear effect of syntactic complexity on ditransitive sentence processing. In short, syntactic complexity modulates the first-object position advantage. This pattern is supported by well-established production preferences like the end weight principle (Arnold et al., 2000; Wasow, 1997), which refers to the tendency to place longer and more complex constituents toward the end of the sentence. This tendency is mostly attributed to production efficiency. It is assumed that shorter constituents are placed before the longer ones to spare more time for the planning of more complex constituents.

From the perspective of the PDC framework (MacDonald, 2013), it is expected that this production preference leads to consistent distributional patterns in the input. As a result, speakers of the language become familiar with these patterns and process them more efficiently when they conform to these expectations. When the longer objects are encountered in the first-object position in Experiment 3, reading time increases, which may be interpreted as a mismatch between expected and actual structure.

In addition, the finding of the interaction between complexity and order shows that complexity of the constituent is more pronounced in first object position in Turkish ditransitive structures. This finding reinforces the view that processing is not only shaped by linear order, but also by the interaction between syntactic complexity and distributional expectations in Turkish ditransitive sentences.

The limited effect of animacy observed in Experiment 4 is in line with the PDC framework, as the absence of a strong production bias reduces its influence on distributional patterns and, consequently, on comprehension.

Within the PDC framework, existing production preferences shape distributional patterns in the input and the patterns that occur more frequently in a language become more strongly represented and are therefore processed more efficiently. The reason why processing is influenced differently by various factors is related to the fact that these factors play different roles in production and therefore, their effect on distributional patterns is not the same. While givenness and syntactic complexity have strong production biases like *Given-before-New* principle (Clark

& Clark,1977) and end weight principle (Behaghel, 1990; as cited in Szmrecsányi, 2004) respectively, animacy does not have a systematic production constraint or consistent grammatical encoding in Turkish. Distributional patterns associated with given objects before the new objects, shorter objects before the longer objects and animate objects before the inanimate objects may occur with different frequencies. Consequently, while givenness and syntactic complexity appear to show clear and robust effects on processing, animacy remains a comparatively weak cue.

First-object position advantage does not appear to be directly related to the distributional patterns in the language, but it can be explained with incremental sentence processing. It needs to be noted that first-object position advantage is modulated by givenness and syntactic complexity.

Overall, it can be said that processing is shaped by multiple interacting cues, and these cues generally reflect production biases. The strength of these cues depends on their consistency, frequency and structural encoding in the language. The findings highlight that ditransitive sentence processing in Turkish is shaped by a hierarchy of cues, where relative strength of each cue reflects its role in production and its consistency in the input.

CONCLUSION

This study aims to investigate the processing of the different object orders in Turkish ditransitive constructions. Along with this overall goal, it also examines givenness, syntactic complexity and animacy effects on the processing of object order variations in Turkish ditransitive sentences. In line with these aims, the study attempts to answer four research questions that are discussed in the light of the findings.

RQ1: *How do object order variations (ACC>DAT or DAT>ACC) produce processing difference in Turkish ditransitive structures presented in context?*

The findings of the Experiment 1 reveal that in Turkish ditransitives, ACC>DAT and DAT>ACC ordered sentences are processed with similar ease. Regional analysis shows that both types of objects are processed faster when placed in the first object position compared to their counterparts in the second object position. This suggests that rather than having an easier object order, Turkish ditransitives have a positional advantage. This finding may be explained by incremental sentence processing which proposes that comprehenders start constructing a sentence structure from the onset of the sentences.

The discovery of not having an easier object order may be attributed to either information structure influence on order or structural properties of Turkish ditransitives such as clear case marking and possible two canonical orders. Furthermore, these findings suggest that processing difficulty does not necessarily correspond to canonical word order. In other words, structures that are considered noncanonical may be processed with similar ease as canonical ones. This finding challenges the assumption that canonical order necessarily leads to processing advantage.

The finding that there is no processing advantage for either ACC>DAT or DAT>ACC object orders in Turkish ditransitive constructions is especially important, as it suggests that canonicality and processing ease should not

necessarily be considered equivalent concepts. Human sentence processing appears to be influenced by multiple factors, and canonical structure alone may not be sufficient to determine processing ease. In Turkish, overt case marking may reduce the need to rely on object order for identifying grammatical relations. As a result, alternative object orders can be processed with similar ease despite differences in their frequency or canonical status.

RQ2. *What are the effects of givenness of the object NPs on the processing of Turkish ditransitive structures presented in context?*

Experiment 2 examined the effect of givenness on Turkish ditransitives related to object order. Basically, given ditransitive objects whether accusative or dative are statistically significantly processed faster in the initial position compared to the second-object position. The results indicate that given objects regardless of their cases are indeed processed faster when they are placed first. In addition, first-object position advantage of dative and accusative objects disappears or significantly decreases by their non-givenness. Specifically, when non-given objects appear in first-object position, they are not processed as fast as given objects. It can be added that case marking of the objects do not make a difference in this condition.

Based on these findings, it can be suggested that Turkish ditransitive constructions follow the *Given-before-New* principle as a production pattern where given entities when placed early in a sentence are processed faster.

RQ3. *What are the effects of syntactic complexity of the object NPs on the processing of Turkish ditransitive structures presented in context?*

Experiment 3 focuses on the effect of syntactic complexity on Turkish ditransitive processing. Following end weight principle, it is proposed that syntactically more complex entities are mostly placed near the end of the sentence. However, there is another argument that this principle works as a mirror-image effect where less complex constituents are mostly near the end of the sentence in verb-final languages like Japanese.

Experiment 3 tested ACC>DAT and DAT>ACC orders in related to the complexity of these objects. It was found that less complex objects, whether dative or accusative, were processed significantly faster when they occupied the first-object position. In contrast, when a more complex object appeared first, the general first-object position advantage was substantially reduced. Total reading times also decreased when less complex objects preceded more complex ones. This pattern is compatible with the end-weight principle, although the present study does not directly demonstrate that syntactically complex objects are processed more easily simply because they occur in the second position. At the same time, the findings do not provide support for the mirror-image account proposed for some verb-final languages.

RQ4. *What are the effects of animacy of the object NPs on the processing of Turkish ditransitive structures presented in context?*

Experiment 4 analyzed animacy effect in relation to Turkish ditransitive processing. It is mostly asserted that animate constituents are mostly placed before the inanimate ones in world languages. This experiment questions whether this production preference is reflected in processing and compares first-position animate and inanimate objects with their second-position counterparts.

The findings do not reveal a consistent pattern neither for accusative nor for dative objects. Although animate objects are processed faster in the first-object position regardless of their case marking, inanimate accusative objects are also processed more easily in the initial position. This creates a dilemma as to whether this processing facilitation is driven by animacy or by a general first-object position advantage. Based on the findings of Experiment 4, animacy does not appear to be a strong cue in the processing of Turkish ditransitive structures. Its effect is likely modulated by more reliable and consistently available cues.

An interesting observation is that both givenness and syntactic complexity produced similar processing patterns. In both experiments, processing was facilitated when the object order matched production preferences such as *Given-before-New* and end weight principles. Given objects were processed more easily

when they preceded non-given objects, and less complex objects were processed more easily when they preceded more complex objects. This parallelism suggests that different linguistic factors may influence language processing through similar underlying mechanisms.

The findings of the present study show that not all factors affect processing equally. This interpretation is compatible with the assumptions of the Production-Distribution-Comprehension (PDC) account, which proposes that production preferences shape distributional patterns and subsequently influence comprehension. Processing ease appears to depend on the consistency of distributional patterns, which is determined by the strength of a cue. When a production preference is systematic, it influences the frequency of certain structures. This leads to more consistent distributions that facilitate comprehension. Within this framework, givenness and syntactic complexity appear to emerge as a strong cue in the processing of Turkish ditransitive sentences, whereas animacy appears to function as a comparatively weaker cue. This distinction may be related to the extent to which these factors create systematic production preferences. Both givenness and syntactic complexity are associated with relatively stable ordering tendencies. As a result, comprehenders may become more sensitive to these patterns through repeated exposure. Animacy, on the other hand, appears to interact with other cues and therefore does not produce equally robust processing effects in Turkish ditransitives.

Before concluding the study, it is necessary to state some limitations that should be taken into consideration when interpreting the findings. Like all experimental studies, the present study has certain limitations. First of all, the data were obtained through a self-paced reading experiment, which does not fully reflect natural reading conditions since the sentences were presented in a segmented, region-by-region format. It should also be noted that, although PsychoPy provides precise control over stimulus presentation and allows the collection of online processing data, different experimental platforms may vary in their timing precision and response-recording procedures. Consequently, the magnitude of the observed effects, or the detection of more subtle processing differences,

might have varied if a different platform had been used. Eye-tracking and ERP studies could also provide valuable alternatives and strengthen the reliability of the findings. In addition, the sentences used in psycholinguistic data collection methods are generally less natural than authentic linguistic input.

Another drawback is related to the givenness status of the objects. In this study, givenness is operationalized as saliency through contextual manipulation. However, these contexts may not always sound natural in the study and capture all dimensions of givenness, although this approach allows for a controlled manipulation of discourse context.

Another limitation concerns participant recruitment. The participants were recruited through convenience sampling from a university population. Although this approach made data collection feasible and ensured a relatively homogeneous participant group, it limits the generalizability of the findings. The results therefore should be interpreted with caution when extending them to the broader Turkish-speaking population. This study can also be conducted with Turkish speakers who belong to more diverse populations in terms of their age, education, socio-economic status and even with individuals with diverse cognitive profiles to be able to talk about general processing mechanism in Turkish language.

In addition to these limitations, another one is related to the semantic roles of the dative objects. The experimental sentences included only ditransitive structures. However, both transfer verbs and placement verbs were used, resulting in two types of dative objects. Therefore, the semantic roles of the dative objects were not systematically controlled across the experimental items. Depending on the verb, the dative object functioned either as a recipient/beneficiary or as a goal. Future studies may control this variability by including only one type of dative object in the experimental materials, thereby providing a more reliable evaluation of the effect of semantic roles on sentence processing.

The last limitation is related to one of the follow-up analyses. In the analysis where accusative and dative objects' reading times were compared in the same

position, but certain lexical, syntactic and semantic factors were not fully controlled. Since this was a follow-up analysis looking at the findings from a different angle, the experimental material was not prepared for this analysis at the beginning. It should be considered as an exploratory or complementary analysis. Future studies should aim to control these factors more systematically in order to provide a more reliable comparison between accusative and dative objects.

Although the study has some limitations mentioned above, the study presents several contributions to the understanding of Turkish ditransitives. One important contribution of the present study is the use of contextualized ditransitive sentences. Previous studies frequently investigated constituent order through isolated sentences. In the present study, the target sentences were embedded in short discourse contexts, and this made the manipulation of factors such as givenness presented in a more natural way. This design made it possible to examine processing of ditransitive object ordering within a discourse environment rather than in an isolated sentence. The findings suggest that contextual information plays an important role in shaping processing patterns and should be considered in future research on Turkish word order variation. However, it should also be mentioned that the findings obtained can only be interpreted in relation to the existing of a context and studies conducted with isolated sentence may provide different results. This is particularly important for Turkish because constituent order variation is closely related to discourse organization. Examining object order without context may overlook the role of discourse accessibility and information status. Therefore, contextualized designs may provide a more comprehensive understanding of Turkish word order variation than isolated sentence paradigms.

The findings of the study have various implications. One of the fields that the current findings can be employed is the teaching of Turkish as a second language. The results show that the order of two objects in Turkish ditransitive constructions should not be taught in isolation since it is not strict and it depends on various factors. Therefore, the learners of Turkish as a foreign language

should be aware of these two possible object orders. Teachers of Turkish as a second language can focus on the order of objects in such sentences, making references to factors like givenness and syntactic complexity in their lessons. Another contribution of the study is to the area of psycholinguistics. Based on the results, it can be stated that processing in Turkish is not affected by only one factor. It is important to consider interaction between different cues while conducting sentence processing studies in Turkish. This study is also valuable for the area of language technologies. It can be useful for researchers working in machine translation, speech systems and NLP (Natural Language Processing) since it highlights the relations among word order, case and givenness. Lastly, the study can also help people make their communication clearer for the listeners. If speakers or writers pay attention to the features that make a text cognitively less challenging, they can make their ideas heard more clearly. This is especially important for people who work in fields such as academy, politics, literary works and advertisement.

Building on the findings of the present study, several directions for future research can be suggested. First, future studies may investigate Turkish ditransitive constructions presented without discourse contexts in order to determine whether the absence of a processing advantage for either ACC>DAT or DAT>ACC orders is maintained in isolated sentences. If a similar pattern is observed without contextual support, it may provide further evidence that the lack of an overall order preference reflects more fundamental structural properties of Turkish rather than discourse context alone. Since the present study focused on online comprehension, future research may also examine Turkish ditransitive constructions through production experiments and corpus-based analyses to determine whether the processing patterns observed here are reflected in language production and naturally occurring language use. Furthermore, comparing reading-based measures with auditory or spoken language processing tasks may provide a more comprehensive understanding of Turkish sentence processing across modalities. Future studies may also investigate whether the first-object position advantage persists in different sentence structures, such as those containing intervening adverbial phrases between the

subject and the first object, different adverbial placements, or post-verbal object positions. Examining these alternative constituent positions may help determine whether the processing patterns observed in the present study generalize across different syntactic configurations. Finally, future studies including monotransitive constructions as a comparison condition may provide a more direct test of the incremental processing account proposed as one possible explanation for the present findings.

To sum up, the findings of the present study suggest that Turkish ditransitive structures are not processed based on a single factor. Instead, there are various factors such as the interaction of object position with discourse accessibility, syntactic complexity, and the structural properties of Turkish. The consistent advantage of first-position objects across experiments may indicate that linear position plays a central role in processing. At the same time, the effects of givenness and syntactic complexity demonstrate that sentence comprehension is sensitive to distributional regularities that emerge from language use. Taken together, these findings appear to support the view that Turkish sentence processing reflects both the structural characteristics of the language and distributional patterns based on production. Therefore, the study contributes to the understanding of how multiple linguistic cues interact during real-time comprehension in a flexible word-order language such as Turkish.

BIBLIOGRAPHY

Abdollahnejad, E. (2020). Online and offline examinations of constituent order in Persian ditransitives (Doctoral dissertation, University of Calgary). https://hdl.handle.net/1880/112204

Altmann, G. T. M., & Kamide, Y. (1999). Incremental interpretation at verbs: restricting the domain of subsequent reference. *Cognition*, *73*(3), 247–264. https://doi.org/10.1016/S0010-0277(99)00059-1

Anderssen, M., Rodina, Y., Mykhaylyk, R., & Fikkert, P. (2014). The acquisition of the dative alternation in Norwegian. *Language Acquisition*, *21*(1), 72–102. https://doi.org/10.1080/10489223.2013.864296

Arai, M., van Gompel, R. P. G., & Scheepers, C. (2007). Priming ditransitive structures in comprehension. *Cognitive Psychology*, *54*(3), 218–250. https://doi.org/10.1016/j.cogpsych.2006.07.001

Ariel, M. (1988). Referring and accessibility. *Journal of Linguistics*, *24*(1), 65–87. https://doi.org/10.1017/S0022226700011567

Ariel, M. (1990). *Accessing noun-phrase antecedents*. Routledge.

Ariel, M. (2001). Accessibility theory: An overview. In T. Sanders, J. Schilperoord, & W. Spooren (Eds.), *Text representation: Linguistic and psycholinguistic aspects* (Vol. 8, pp. 29–87). John Benjamins Publishing Company. https://doi.org/10.1075/hcp.8.04ari

Arnold, J. E., Losongco, A., Wasow, T., & Ginstrom, R. (2000). Heaviness vs. newness: The effects of structural complexity and discourse status on constituent ordering. *Language*, *76*(1), 28–55. https://doi.org/10.1353/lan.2000.0045

Arnold, J. E., Kaiser, E., Kahn, J. M., & Kim, L. K. (2013). Information structure: Linguistic, cognitive, and processing approaches. *Wiley Interdisciplinary Reviews: Cognitive Science*, *4*(4), 403–413. https://doi.org/10.1002/wcs.1234

Asami, D., & Tomioka, S. (2025). Online processing of subject-initial non-canonical sentences: Interaction of syntax with information structure. *Glossa Psycholinguistics*, *4*(1). https://doi.org/10.5070/G6011.42237

Bader, M. (1994). Syntactic-function ambiguities. *Folia Linguistica, 28*(1–2), 5–66. https://doi.org/10.1515/flin.1994.28.1-2.5

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Bazhukov, M. O., Chubarova, L. I., Slioussar, N. A., & Toldova, S. Yu. (2021). The order of objects in Russian: a corpus study. *Komp'juternaja Lingvistika i Intellektual'nye Tehnologii*, *2021-June*(20), 68–78. https://doi.org/10.28995/2075-7182-2021-20-68-78

Bock, J. K. (1982). Toward a cognitive psychology of syntax: Information processing contributions to sentence formulation. *Psychological Review*, *89*(1), 1–47. https://doi.org/10.1037/0033-295X.89.1.1

Bock, J. K., & Warren, R. K. (1985). Conceptual accessibility and syntactic structure in sentence formulation. *Cognition*, *21*(1), 47–67. https://doi.org/10.1016/0010-0277(85)90023-X

Boland, J. E. (1997). The relationship between syntactic and semantic processes in sentence comprehension. *Language and Cognitive Processes*, *12*(4), 423–484. https://doi.org/10.1080/016909697386808

Bornkessel, I., Schlesewsky, M., & Friederici, A. D. (2002). Grammar overrides frequency: evidence from the online processing of flexible word order. *Cognition*, *85*(2), B21–B30. https://doi.org/10.1016/S0010-0277(02)00076-8

Bresnan, J., Cueni, A., Nikitina, T., & Harald Baayen, R. (2007). Predicting the dative alternation. In G. Bouma, I. Kraemer, & J. Zwarts (Eds.), *Cognitive foundations of interpretation* (pp. 69–94). KNAW.

Bresnan, J., & Nikitina, T. (2009). The gradience of the dative alternation. In L.-H. Wee & L. Uyechi (Eds.), *Reality exploration and discovery: Pattern interaction in language and life* (pp. 161–184). CSLI Publications.

Brown, M., Savova, V., & Gibson, E. (2012). Syntax encodes information structure: Evidence from on-line reading comprehension. *Journal of Memory and Language*, *66*(1), 194–209. https://doi.org/10.1016/j.jml.2011.08.006

Choi, H.-W. (2009). Ordering a left-branching language: Heaviness vs. givenness. *Language and Information*, *13*(1), 39–56. https://doi.org/10.29403/LI.13.1.3

Chomsky, N. (2002). *On nature and language* (A. Belletti & L. Rizzi, Eds.). Cambridge University Press. https://doi.org/10.1017/CBO9780511613876

Clark, H. H., & Clark, E. V. (1977). *Psychology and language: An introduction to psycholinguistics*. Harcourt Brace Jovanovich.

Clifton, C., & Frazier, L. (2004). Should given information come before new? Yes and no. *Memory & Cognition*, *32*(6), 886–895. https://doi.org/10.3758/BF03196867

Demiral, Ş. B., Schlesewsky, M., & Bornkessel-Schlesewsky, I. (2008). On the universality of language comprehension strategies: Evidence from Turkish. *Cognition*, *106*(1), 484–500. https://doi.org/10.1016/j.cognition.2007.01.008

Drenhaus, H., & Féry, C. (2008). Animacy and child grammar: An OT account. *Lingua*, *118*(2), 222–244. https://doi.org/10.1016/j.lingua.2007.02.006

Dörnyei, Z. (2007). *Research methods in applied linguistics*. Oxford University Press.

Enç, M. (1991). The semantics of specificity. *Linguistic Inquiry*, *22*(1), 1–25. https://www.jstor.org/stable/4178706

Erdocia, K., Laka, I., Mestres-Missé, A., & Rodriguez-Fornells, A. (2009). Syntactic complexity and ambiguity resolution in a free word order language: Behavioral and electrophysiological evidences from Basque. *Brain and Language*, *109*(1), 1–17. https://doi.org/10.1016/j.bandl.2008.12.003

Erguvanlı, E. E. (1984). *The function of word order in Turkish grammar*. University of California Press.

Erguvanlı-Taylan, E. (1987). The role of semantic features in Turkish word order. *Folia Linguistica, 21*(2–4), 215–228. https://doi.org/10.1515/flin.1987.21.2-4.215

Faghiri, P., & Samvelian, P. (2014). Constituent ordering in Persian and the weight factor. In C. Piñón (Ed.), *Empirical issues in syntax and semantics 10* (pp. 215–232). http://www.cssp.cnrs.fr/eiss10/

Faghiri, P., Samvelian, P., & Hemforth, B. (2014). Accessibility and word order: The case of ditransitive constructions in Persian. *Proceedings of the 21st International Conference on Head-Driven Phrase Structure Grammar*, 217–237. https://doi.org/10.21248/hpsg.2014.12

Faghiri, P., & Samvelian, P. (2020). Word order preferences and the effect of phrasal length in SOV languages: Evidence from sentence production in Persian. *Glossa: A Journal of General Linguistics*, *5*(1). https://doi.org/10.5334/gjgl.1078

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). *Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses*. *Behavior Research Methods, 41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Ferreira, F., & Henderson, J. M. (1990). Use of verb information in syntactic parsing: Evidence from eye movements and word-by-word self-paced reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *16*(4), 555–568. https://doi.org/10.1037/0278-7393.16.4.555

Ferreira, F., & Çokal, D. (2016). Sentence processing. In G. Hickok & S. L. Small (Eds.), *Neurobiology of language* (pp. 265–274). Elsevier. https://doi.org/10.1016/B978-0-12-407794-2.00022-5

Frazier, L., & Rayner, K. (1982). Making and correcting errors during sentence comprehension: Eye movements in the analysis of structurally ambiguous sentences. *Cognitive Psychology*, *14*(2), 178–210. https://doi.org/10.1016/0010-0285(82)90008-1

Georgala, E. (2011). Scrambling verb-final languages and the underlying order of objects in ditransitive constructions. *University of Pennsylvania Working Papers in Linguistics*, *17*(1), 105–114. http://repository.upenn.edu/pwpl/vol17/iss1/13

Gibson, E. (1998). Linguistic complexity: Locality of syntactic dependencies. *Cognition*, *68*(1), 1–76. https://doi.org/10.1016/S0010-0277(98)00034-1

Givón, T. (1983). *Topic continuity in discourse: A quantitative cross-language study* (Vol. 3). John Benjamins Publishing Company. https://doi.org/10.1075/tsl.3

Göksel, A., & Kerslake, C. (2004). *Turkish: A comprehensive grammar*. Routledge. https://doi.org/10.4324/9780203340769

Goldberg, A. E. (1995). *Constructions: A construction grammar approach to argument structure*. University of Chicago Press.

Gropen, J., Pinker, S., Hollander, M., & Goldberg, R. (1991). Affectedness and direct objects: The role of lexical semantics in the acquisition of verb argument

structure. *Cognition*, *41*(1–3), 153–195. https://doi.org/10.1016/0010-0277(91)90035-3

Gundel, J. K. (1988). Universals of topic-comment structure. In M. Hammond, E. A. Moravcsik, & J. Wirth (Eds.), *Studies in syntactic typology* (Vol. 17, pp. 209–239). John Benjamins. https://doi.org/10.1075/tsl.17.16gun

Harley, T. A. (2013). *The psychology of language*. Psychology Press. https://doi.org/10.4324/9781315859019

Haspelmath, M. (2015). Ditransitive constructions. *Annual Review of Linguistics*, *1*(1), 19–41. https://doi.org/10.1146/annurev-linguist-030514-125204

Hawkins, J. A. (1990). A parsing theory of word order universals. *Linguistic Inquiry*, *21*(2), 223–261. https://www.jstor.org/stable/4178670

Hawkins, J. A. (1994). *A Performance Theory of Order and Constituency*. Cambridge University Press.

Ibbotson, P. (2013). The scope of usage-based theory. *Frontiers in Psychology*, *4*. https://doi.org/10.3389/fpsyg.2013.00255

İşsever, S. (2003). Information structure in Turkish: The word order–prosody interface. *Lingua*, *113*(11), 1025–1053. https://doi.org/10.1016/S0024-3841(03)00012-3

İşsever, S. (2006). On the NSR and focus projection in Turkish. In S. Yağcıoğlu & A. C. Değer (Eds.), *Advances in Turkish linguistics: Proceedings of the 12th International Conference on Turkish Linguistics* (pp. 421–435). Dokuz Eylül University Press.

Jegerski, J. (2013). Self-paced reading. In J. Jegerski & B. VanPatten (Eds.), *Research methods in second language psycholinguistics* (pp. 20–49). Routledge. https://doi.org/10.4324/9780203123430

Jiang, N. (2013). *Conducting reaction time research in second language studies*. Routledge. https://doi.org/10.4324/9780203146255

Jing, Y., Widmer, P., & Bickel, B. (2021). Word order variation is partially constrained by syntactic complexity. *Cognitive Science*, *45*(11), e13056. https://doi.org/10.1111/COGS.13056

Just, M. A., & Carpenter, P. A. (1980). A theory of reading: From eye fixations to comprehension. *Psychological Review*, *87*(4), 329–354. https://doi.org/10.1037/0033-295X.87.4.329

Just, M. A., Carpenter, P. A., & Woolley, J. D. (1982). Paradigms and processes in reading comprehension. *Journal of Experimental Psychology: General*, *111*(2), 228–238. https://doi.org/10.1037/0096-3445.111.2.228

Kahraman, B. (2013). Word order preferences of ditransitives in Turkish. *MIT Working Papers in Linguistics*, *67*, 175–180.

Kahraman, B., Sato, A., & Sakai, H. (2010). Processing two types of ditransitive sentences in Turkish: Preliminary results from a self-paced reading study. *IEICE Technical Report, 110*(163), 37–42.

Kempen, G., & Harbusch, K. (2004). A corpus study into word order variation in German subordinate clauses: Animacy affects linearization independently of grammatical function assignment. In T. Pechmann & C. Habel (Eds.), *Multidisciplinary approaches to language production* (pp. 173–182). De Gruyter Mouton. https://doi.org/10.1515/9783110894028.173

Kim, H., Chen, Y., & Liu, X. (2022). Bilingual processing of verbal and constructional information in English dative constructions: Effects of cross-linguistic influence. *Cognitive Linguistics*, *33*(4), 701–726. https://doi.org/10.1515/cog-2021-0122

King, A., & Wedel, A. (2020). Greater early disambiguating information for less-probable words: The lexicon is shaped by incremental processing. *Open Mind*, *4*, 1–12. https://doi.org/10.1162/opmi_a_00030

Kizach, J. (2012). Evidence for weight effects in Russian. *Russian Linguistics*, *36*(3), 251–270. https://doi.org/10.1007/s11185-012-9096-0

Kizach, J. (2017). Production of the double object construction: An experiment. *Nordic Journal of Linguistics*, *40*(3), 373–382. https://doi.org/10.1017/S033258651700018X

Kizach, J., & Balling, L. W. (2013). Givenness, complexity, and the Danish dative alternation. *Memory and Cognition*, *41*(8), 1159–1171. https://doi.org/10.3758/s13421-013-0336-3

Köhne, J., Pickering, M. J., & Branigan, H. P. (2014). The relationship between sentence meaning and word order: Evidence from structural priming in German. *The*

Quarterly Journal of Experimental Psychology, *67*(2), 304–318. https://doi.org/10.1080/17470218.2013.807855

Koizumi, M., & Tamaoka, K. (2004). Cognitive processing of Japanese sentences with ditransitive verbs. *Journal of the Linguistic Society of Japan*, *125*, 173–190. https://doi.org/10.11435/gengo1939.2004.125_173

Koizumi, M., Yasugi, Y., Tamaoka, K., Kiyama, S., Kim, J., Sian, J. E. A., & Mátzar, L. P. O. G. (2014). On the (non)universality of the preference for subject-object word order in sentence comprehension: A sentence-processing study in Kaqchikel Maya. *Language*, *90*(3), 722–736. https://doi.org/10.1353/lan.2014.0068

Kornfilt, J. (1997). *Turkish*. Routledge. https://doi.org/10.4324/9781315823652

Kornfilt, J. (2003). Scrambling, subscrambling, and case in Turkish. In S. Karimi (Ed.), *Word order and scrambling* (pp. 125–155). Blackwell Publishing Ltd. https://doi.org/10.1002/9780470758403.ch6

Krause, E., & von Heusinger, K. (2019). Gradient effects of animacy on differential object marking in Turkish. *Open Linguistics*, *5*(1), 171–190. https://doi.org/10.1515/opli-2019-0011

Kural, M. (1992). Scrambling and mixed positions in Turkish. *Proceedings of the North East Linguistic Society, 22, 259–272.*

Kurt, D., & Bakay, Ö. (2021). Türkçede çift geçişli fiilleri işlemlemede canlılık özelliğinin etkisi. In *34. Ulusal Dilbilim Kurultayı Bildiri Özetleri Kitapçığı* (pp. 29–31). Orta Doğu Teknik Üniversitesi.

Kurt, D., & Dinçtopal Deniz, N. (2023). Processing focus in Turkish. *Languages*, *8*(1), 38. https://doi.org/10.3390/languages8010038

Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2017). lmerTest package: Tests in linear mixed effects models. *Journal of Statistical Software, 82*(13), 1–26. https://doi.org/10.18637/jss.v082.i13

Lamers, M. J. A., & de Swart, P. (2012). The interaction of case, word order and prominence: Language production and comprehension in a cross-linguistic perspective. In M. J. A. Lamers & P. de Swart (Eds.), *Case, word order and prominence: Interacting cues in language production and comprehension* (pp. 1–15). Springer. https://doi.org/10.1007/978-94-007-1463-2_1

Lee, E.-K., & Watson, D. G. (2012). Sentence processing. In V. S. Ramachandran (Ed.), *Encyclopedia of human behavior* (2nd ed., pp. 387–395). Elsevier. https://doi.org/10.1016/B978-0-12-375000-6.00321-9

Levin, B. (2006). *English object alternations: A unified account* [Unpublished manuscript]. Stanford University. https://web.stanford.edu/~bclevin/alt06.pdf

Levin, B., & Rappaport Hovav, M. (2005). *Argument realization*. Cambridge University Press. https://doi.org/10.1017/CBO9780511610479

Levy, R. (2008). Expectation-based syntactic comprehension. *Cognition*, *106*(3), 1126–1177. https://doi.org/10.1016/j.cognition.2007.05.006

Levy, R. P., & Keller, F. (2013). Expectation and locality effects in German verb-final structures. *Journal of Memory and Language*, *68*(2), 199–222. https://doi.org/10.1016/j.jml.2012.02.005

MacDonald, M. C. (1994). Probabilistic constraints and syntactic ambiguity resolution. *Language and Cognitive Processes*, *9*(2), 157–201. https://doi.org/10.1080/01690969408402115

MacDonald, M. C. (1999). Distributional information in language comprehension, production, and acquisition: Three puzzles and a moral. In B. MacWhinney (Ed.), *The emergence of language* (pp. 177–196). Lawrence Erlbaum Associates. https://doi.org/10.4324/9781410602367-11

MacDonald, M. C. (2013). How language production shapes language form and comprehension. *Frontiers in Psychology*, *4*. https://doi.org/10.3389/fpsyg.2013.00226

Miyagawa, S. (1997). Against optional scrambling. *Linguistic Inquiry*, *28*, 1–25.

Miyagawa, S., & Tsujioka, T. (2004). Argument structure and ditransitive verbs in Japanese. *Journal of East Asian Linguistics*, *13*(1), 1–38. https://doi.org/10.1023/B:JEAL.0000007345.64336.84

Mykhaylyk, R., Rodina, Y., & Anderssen, M. (2013). Ditransitive constructions in Russian and Ukrainian: Effect of givenness on word order. *Lingua*, *137*, 271–289. https://doi.org/10.1016/j.lingua.2013.10.001

Ozón, G. A. (2009). *Alternating ditransitives in English: A corpus-based study* (Doctoral dissertation, University College London). UCL Discovery. https://discovery.ucl.ac.uk/id/eprint/18714/

Öztürk, B. (2005). *Case, referentiality and phrase structure* (Vol. 77). John Benjamins Publishing Company. https://doi.org/10.1075/la.77

Öztürk, B. (2006). Case-driven agree, EPP, and passive in Turkish. In W. Abraham & L. Leisiö (Eds.), *Passivization and typology* (pp. 383–402). John Benjamins Publishing Company. https://doi.org/10.1075/tsl.68.23ozt

Öztürk, J. (2008). Türkçede çift nesneli fiiller. *Türk Dünyası İncelemeleri Dergisi*, *8*(1), 163–170.

Papadopoulou, D. (2006). *Cross-linguistic variation in sentence processing*. Springer.

Pappert, S., & Pechmann, T. (2012). The impact of case and prosody on the availability of argument structures. In M. J. A. Lamers & P. de Swart (Eds.), *Case, word order and prominence: Interacting cues in language production and comprehension* (pp. 173–186). Springer.

Park, K. S. (2018). Information structure in canonical and scrambled dative orders in L2 Korean. *Linguistics Vanguard*, *4*. https://doi.org/10.1515/lingvan-2016-0097

Peirce, J., Gray, J. R., Simpson, S., MacAskill, M., Höchenberger, R., Sogo, H., Kastman, E., & Lindeløv, J. K. (2019). PsychoPy2: Experiments in behavior made easy. *Behavior Research Methods*, *51*(1), 195–203. https://doi.org/10.3758/s13428-018-01193-y

Pickering, M. J., & van Gompel, R. P. G. (2006). Syntactic parsing. In M. J. Traxler & M. A. Gernsbacher (Eds.), *Handbook of psycholinguistics* (2nd ed., pp. 455–503). Elsevier.

Pimentel, T., Cotterell, R., & Roark, B. (2021). Disambiguatory signals are stronger in word-initial positions. *Proceedings of the 16th Conference of the European Chapter of the Association for Computational Linguistics: Main Volume*, 31–41. https://doi.org/10.18653/v1/2021.eacl-main.3

Prat-Sala, M., & Branigan, H. P. (2000). Discourse constraints on syntactic processing in language production: A cross-linguistic study in English and Spanish. *Journal of Memory and Language*, *42*(2), 168–182. https://doi.org/10.1006/jmla.1999.2668

Primus, B. (1998). The relative order of recipient and patient in the languages of Europe . In A. Siewierska (Ed.), *Constituent order in the languages of Europe* (pp. 421–474). De Gruyter Mouton. https://doi.org/10.1515/9783110812206.421

Primus, B. (2012). Animacy, generalized semantic roles, and differential object marking. In M. J. A. Lamers & P. de Swart (Eds.), *Case, word order and prominence: Interacting cues in language production and comprehension* (pp. 65–90). Springer. https://doi.org/10.1007/978-94-007-1463-2_

Prince, E. F. (1981). Toward a taxonomy of given/new information. In P. Cole (Ed.), *Radical pragmatics* (pp. 223–255). Academic Press.

Prince, E. F. (1992). The ZPG letter: Subjects, definiteness, and information-status. In S. Thompson & W. Mann (Eds.), *Discourse description: Diverse analyses of a fundraising text* (pp. 295–325). John Benjamins. https://doi.org/10.1075/pbns.16.12pri

R Core Team. (2025). *R: A language and environment for statistical computing* [Computer software]. R Foundation for Statistical Computing.

Rösler, F., Pechmann, T., Streb, J., Röder, B., & Hennighausen, E. (1998). Parsing of sentences in a language with varying word order: Word-by-word variations of processing demands are revealed by event-related brain potentials. *Journal of Memory and Language*, *38*(2), 150–176. https://doi.org/10.1006/jmla.1997.2551

Schröter, S. (2021). Ditransitive constructions in Caucasian Urum–The effect of givenness on the linearization of objects. *Language Sciences*, *83*. https://doi.org/10.1016/j.langsci.2020.101290

Sekerina, I. A. (2003). Scrambling and processing: Dependencies, complexity, and constraints. In S. Karimi (Ed.), *Word order and scrambling* (pp. 301–324). Blackwell Publishing.

Sezer, E. (1978). Eylemlerin çoğul öznelere uyumu [Agreement of verbs and plural subjects]. *Genel Dilbilim Dergisi, 1*(1), 25–32.

Shim, H. E., & Han, C. (2025). Acceptability of double object constructions in Korean ditransitive structures. *Proceedings of the 2025 Annual Conference of the Canadian Linguistic Association*.

Slioussar, N. (2011). Processing of a free word order language: The role of syntax and context. *Journal of Psycholinguistic Research*, *40*(4), 291–306. https://doi.org/10.1007/s10936-011-9171-5

Sofu, H., & Ertekin Sucak, D. (2018). Acquisition of ditransitive verbs in Turkish. *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*, *47*(2), 833–843. https://doi.org/10.14812/cuefd.413259

Swierska, A. (1988). *Word order rules*. Croom Helm.

Szmrecsányi, B. M. (2004). On operationalizing syntactic complexity. In G. Purnelle, G. Fairon, & A. Dister (Eds.), *Le poids des mots. Proceedings of the 7th International Conference on Textual Data Statistical Analysis* (pp. 1032–1039). Leuven University Press.

Şafak, D. F., & Hopp, H. (2025). Learning L2 grammar from prediction errors? Verb biases in structural priming in comprehension and production. *Bilingualism: Language and Cognition*, *28*(5), 1249–1265. https://doi.org/10.1017/S1366728925000033

Tamaoka, K., Yu, S., Zhang, J., Otsuka, Y., Lim, H., Koizumi, M., & Verdonschot, R. G. (2024). Syntactic structures in motion: investigating word order variations in verb-final (Korean) and verb-initial (Tongan) languages. *Frontiers in Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1360191

Thuilier, J., & Danlos, L. (2012). Semantic annotation of French corpora: animacy and verb semantic classes. *Proceedings of the Eighth International Conference on Language Resources and Evaluation (LREC'12)*, 1533–1537.

Thuilier, J., Abeillé, A., & Crabbé, B. (2014). Ordering preferences for postverbal complements in French. In H. Tyne, V. André, C. Benzitoun, A. Boulton, & Y. Greub (Eds.), *French through corpora: Ecological and data-driven perspectives in French language studies*. Cambridge Scholars Publishing.

Thuilier, J., Grant, M., Crabbé, B., & Abeillé, A. (2021). Word order in French: The role of animacy. *Glossa*, *6*(1), 1–21. https://doi.org/10.5334/GJGL.1155

Trueswell, J. C., & Tanenhaus, M. K. (1994). Toward a lexicalist framework for constraint-based syntactic ambiguity resolution. In C. Clifton Jr., L. Frazier, & K. Rayner (Eds.), *Perspectives on sentence processing* (pp. 155–179). Lawrence Erlbaum Associates.

Turhan, B. (2023). Acquisition of argument structures and ditransitive verbs: Evidence from an elliptical language. *Journal of Child Language Acquisition and Development-JCLAD*, *11*(1), 662-679. https://doi.org/10.5281/zenodo.7738367

Underhill, R. (1972). Turkish participles*. *Linguistic Inquiry*, *3*(1), 87–99.

Uzunca, A., & Akal, T. (2023). The role of animacy in Turkish relative clause production and distribution. *Journal of Psycholinguistic Research*, *52*(6), 2517–2544. https://doi.org/10.1007/s10936-023-10010-3

Velnić, M. (2018). *Ditransitive structures in Croatian adult and child language: The role of animacy and givenness* (Doctoral dissertation, UiT The Arctic University of Norway). UiT Open Research Archive

Velnić, M., & Anderssen, M. (2021). The effect of givenness and referring expression on dative alternation in Norwegian: A reaction time study. *Nordic Journal of Linguistics*, *45*(1), 126-161. https://doi.org/10.1017/S0332586521000081

Wasow, T. (1997). Remarks on grammatical weight. *Language Variation and Change*, *9*(1), 81–105. https://doi.org/10.1017/S0954394500001800

Wasow, T., & Arnold, J. (2003). Post-verbal constituent ordering in English. In G. Rohdenburg & B. Mondorf (Eds.), *Determinants of grammatical variation in English* (pp. 119–154). Mouton de Gruyter. https://doi.org/10.1515/9783110900019.119

Yamamoto, M. (1999). *Animacy and reference* (Vol. 46). John Benjamins Publishing Company. https://doi.org/10.1075/slcs.46

Yamashita, H. (1997). The effects of word-order and case marking information on the processing of Japanese. *Journal of Psycholinguistic Research*, *26*(2), 163–188. https://doi.org/10.1023/A:1025009615473

Yamashita, H., & Chang, F. (2001). “Long before short” preference in the production of a head-final language. *Cognition*, *81*(2), B45–B55. https://doi.org/10.1016/S0010-0277(01)00121-4

Yarar, E. (2018). Differential case marking in Turkish wh-object phrases. *SOAS Working Papers in Linguistics*, *19*, 29–46.

Zaenen, A., Carletta, J., Garretson, G., Bresnan, J., Koontz-Garboden, A., Nikitina, T., O’Connor, M. C., & Wasow, T. (2004). Animacy encoding in English: Why and

how. *Proceedings of the 2004 ACL Workshop on Discourse Annotation - DiscAnnotation ’04*, 118–125. https://doi.org/10.3115/1608938.1608954

APPENDIX 1. ORIGINALITY REPORT

	HACETTEPE ÜNİVERSİTESİ SOSYAL BİLİMLER ENSTİTÜSÜ	Doküman Kodu Form No.	FRM-DR-21
		Yayın Tarihi Date of Pub.	04.01.2023
	FRM-DR-21 Doktora Tezi Orijinallik Raporu *PhD Thesis Dissertation Originality Report*	Revizyon No Rev. No.	02
		Revizyon Tarihi Rev.Date	25.01.2024

HACETTEPE ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İNGİLİZ DİLBİLİMİ ANABİLİM DALI BAŞKANLIĞINA

Tarih: 14/07/2026

Tez Başlığı (Türkçe): Türkçe'deki Çift Nesneli Yapılarda Nesne Sıralaması Değişiriminin İşlenmenmesi

Yukarıda başlığı verilen tezimin a) Kapak sayfası, b) Giriş, c) Ana bölümler ve d) Sonuç kısımlarından oluşan toplam 257 sayfalık kısmına ilişkin, 14/07/2026 tarihinde şahsım/tez danışmanım tarafından Turnitin adlı intihal tespit programından aşağıda işaretlenmiş filtrelemeler uygulanarak alınmış olan orijinallik raporuna göre, tezimin benzerlik oranı % 9 'dur.

Uygulanan filtrelemeler**:

1. ☒ Kabul/Onay ve Bildirim sayfaları hariç
2. ☒ Kaynakça hariç
3. ☒ Alıntılar hariç
4. ☐ Alıntılar dâhil
5. ☒ 5 kelimeden daha az örtüşme içeren metin kısımları hariç

Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orijinallik Raporu Alınması ve Kullanılması Uygulama Esasları'nı inceledim ve bu Uygulama Esasları'nda belirtilen azami benzerlik oranlarına göre tezimin herhangi bir intihal içermediğini; aksinin tespit edileceği muhtemel durumlarda doğabilecek her türlü hukuki sorumluluğu kabul ettiğimi ve yukarıda vermiş olduğum bilgilerin doğru olduğunu beyan ederim.

Gereğini saygılarımla arz ederim.

Buse Şen Erdoğan

Öğrenci Bilgileri			
	Ad-Soyad	Buse Şen Erdoğan	
	Öğrenci No	N19140080	
	Enstitü Anabilim Dalı	İngiliz Dilbilimi	
	Programı	İngiliz Dilbilimi	
	Statüsü	**Doktora** ■	**Lisans Derecesi ile (Bütünleşik) Dr** ☐

DANIŞMAN ONAYI

UYGUNDUR.
Doç. Dr. Emine Yarar

*Tez **Almanca** veya **Fransızca** yazılıyor ise bu kısımda tez başlığı **Tez Yazım Dilinde** yazılmalıdır.
**Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü Tez Çalışması Orijinallik Raporu Alınması ve Kullanılması Uygulama Esasları İkinci bölüm madde (4)'de belirtildiği üzere; Kaynakça hariç, Alıntılar hariç/dahil, 5 kelimeden daha az örtüşme içeren metin kısımları hariç (Limit match size to 5 words) filtreleme yapılmalıdır.

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		Yayın Tarihi *Date of Pub.*	04.01.2023
	FRM-DR-21 Doktora Tezi Orijinallik Raporu *PhD Thesis Dissertation Originality Report*	Revizyon No *Rev. No.*	02
		Revizyon Tarihi *Rev.Date*	25.01.2024

TO HACETTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF ENGLISH LINGUISTICS

Date: 14/07/2026

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	Student Number	N19144060	
	Department	English Linguistics	
	Programme	English Linguistics	
	Status	**PhD** ☒	**Combined MA/MSc-PhD** ☐

SUPERVISOR'S APPROVAL

APPROVED
Doç. Dr. Emine Yarar

**As mentioned in the second part [article (4)/3]of the Thesis Dissertation Originality Report's Codes of Practice of Hacettepe University Graduate School of Social Sciences, filtering should be done as following: excluding refence, quotation excluded/included, Match size up to 5 words excluded.

APPENDIX 2. ETHICS COMMISSION FORM

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T.C.
HACETTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Rektörlük

Sayı : E-35853172-300-00002828632 8.05.2023
Konu : Buse ŞEN ERDOĞAN Hk. (Etik Komisyon İzni)

SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜNE

İlgi : 13.04.2023 tarihli ve E-12908312-300-00002797375 sayılı yazınız.

Enstitünüz İngiliz Dilbilimi Anabilim Dalı Doktora Programı öğrencisi **Buse ŞEN ERDOĞAN**'ın **Doç. Dr. Emine YARAR** danışmanlığında hazırladığı"**Türkçe'deki Çift Nesneli Yapılarda Nesne Sıralaması Değiştiriminin İşlemlenmesi**" başlıklı tez çalışması Üniversitemiz Senatosu Etik Komisyonunun **25 Nisan 2023** tarihinde yapmış olduğu toplantıda incelenmiş olup, etik açıdan uygun bulunmuştur.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. Sibel AKSU YILDIRIM
Rektör Yardımcısı

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APPENDIX 3. MATERIALS OF EXPERIMENT 1

Experimental Sentences

(1)

Context:

Bizim evin iki sokak arkasında halk kütüphanesi var. Bir ay önce oradan matematiğin tarihi ile ilgili bir kitap almıştım. Dün geri verme sürem doldu.

'There is a public library two streets away from our house. A month ago, I borrowed a book on the history of mathematics from there. Yesterday, the due date for returning it expired.'

a. Ben o kütüphaneye o kitabı bıraktım kolayca.

b. Ben o kitabı o kütüphaneye bıraktım kolayca.

'I easily left that book at that library.'

Context:

Uzun zamandır yapmam gereken işler vardı. Erteleyip durduğumu fark ettim. Yapacaklarımın listesini yaptım ve geçen gün halletmeye başladım.

'I had many things that I had been meaning to do for a long time. I realized that had been postponing them. I made a to-do list and started completing them the other day.'

c. Ben bir kütüphaneye bir kitabı bıraktım kolayca.

d. Ben bir kitabı bir kütüphaneye bıraktım kolayca.

'I easily left a book at a library.'

(2)

Context:

Üst komşum çok hayvan sever biri. Sokak hayvanlarıyla zaten hep ilgiliydi ama

kendisi bir hayvan sahiplenememişti bir türlü. Geçen gün bir ilanda küçücük bir kedi gördüm. Komşuma sürpriz yapabileceğimi düşündüm.

'My upstairs neighbour is an animal lover. She has always cared about stray animals, but she had never managed to adopt one. The other day, I saw a tiny kitten in an advertisement and thought that I could surprise my neighbour.'

a. Ben o komşuya o kediyi götürdüm gizlice.

b. Ben o kediyi o komşuya götürdüm gizlice.

'I secretly took that kitten to that neighbour.'

Context:

Zor durumda olan sokak hayvanlarının sahiplendirilmesi için elimden geleni yapmaya çalışıyorum. Sanırım bazen sınırlarımı aşıyorum ve insanlara emrivaki yapabiliyorum. Geçen gün de bu dürtünün önüne geçemedim.

'I try to do my best to help stray animals find homes. I sometimes go too far and make decisions for other people. The other day, I could not resist that urge.'

c. Ben bir komşuya bir kediyi götürdüm gizlice.

d. Ben bir kediyi bir komşuya götürdüm gizlice.

'I secretly took a kitten to a neighbour.'

(3)

Context:

Bu kocaman dolap burada fazlalık yapıyor, geçişe engel oluyor. Karşıdaki ofisin de dolap eksiği var. Benim de aklıma bir fikir geldi.

'This huge cabinet is taking up too much space and blocking the passage. The office across the hall also needs a cabinet. I came up with an idea.'

a. Ben o ofise o dolabı yerleştirdim sessizce.

b. Ben o dolabı o ofise yerleştirdim sessizce.

'I placed that cabinet in that office quietly.'

Context:

Dün yeni iş yerimize taşındık. Herkes o kadar organize çalışıyordu ki bir an kendimi çok yararsız hissettim. Sonra ben de işe koyuldum.

'Yesterday, we moved into our new workplace. Everyone was working so efficiently that I felt useless for a moment. Then I started helping as well.'

c. Ben bir ofise bir dolabı yerleştirdim sessizce.

d. Ben bir dolabı bir ofise yerleştirdim sessizce.

'I placed a cabinet in an office quietly.'

(4)

Context:

Ben düzenli çalışmayı seven bir insanım. Her zaman yapacaklarımı not alır ve gözümün önünde tutarım. Masanın sağındaki panomu da bu tarz notlarım için kullanıyorum. Mesela bugün yapmam gereken tüm işleri bu kâğıda not aldım.

'I am a person who likes to work in an organized way. I always write down the things I need to do and keep them in sight. I use the bulletin board next to my desk for such notes. For example, today I wrote all the tasks I need to complete on this piece of paper.'

a. Ben o panoya o notu tutturdum düzgünce.

b. Ben o notu o panoya tutturdum düzgünce.

'I properly attached that note to that bulletin board.'

Context:

Dünkü organizasyonda herkesin bir görevi vardı. Bazılarınınki çok kolay, bazılarınınki çok zordu. Ama kabul etmek gerekir ki benimki en saçma olanıydı.

'At yesterday's event, everyone had a task. Some were very easy and some were very difficult. However, I have to admit that mine was the most ridiculous one.'

c. Ben bir panoya bir notu tutturdum düzgünce.

d. Ben bir notu bir panoya tutturdum düzgünce.

'I properly attached a note to a bulletin board.'

(5)

Context:

Çatıda baktığım 20 tane güvercinim var. Hepsine bayılırım ama ilk aldığımın bendeki yeri bambaşkadır. Güvercin bakmaya hevesli bir arkadaşım var. Geçen gün bana geldi. Bahsettiğim güvercini benden istedi.

'I keep twenty pigeons on the roof. I love all of them, but the first one I got is especially dear to me. A friend who is interested in raising pigeons visited me the other day. He asked for the pigeon I had been talking about.'

a. Ben o arkadaşa o güvercini verdim güzelce.

b. Ben o güvercini o arkadaşa verdim güzelce.

'I gave that pigeon to that friend carefully.'

Context:

İnsanların birbirini sevdiklerini belli etmesinin bir sürü yolu var. Bazen internette denk geliyorum da ne hediyeler veriyorlar birbirlerine. Ama ben materyal şeylere karşıyım açıkçası. O yüzden de geçen gün şöyle bir şey yaptım.

'There are many ways for people to show that they care about one another. Sometimes I see online the gifts people give each other. Personally, I am not very interested in material things. Therefore, the other day I did something different.'

c. Ben bir arkadaşa bir güvercini verdim güzelce.

d. Ben bir güvercini bir arkadaşa verdim güzelce.

'I gave a pigeon to a friend carefully.'

(6)

Context:

Dün akşam komşuya gitmiştik, orada bir adamla karşılaştık. Kendisi buralara yeni taşınmış ve doktor bulamadığını, bir doktora ihtiyacı olduğunu söyledi. Bizim de çok sevdiğimiz bir aile doktorumuz var, çok başarılı bir doktordur.

'Last night, we visited a neighbour and met a man there. He had recently moved to

the area and said that he had not been able to find a doctor and needed one. We happen to know an excellent family doctor whom we trust very much.'

a. Ben o doktora o adamı yönlendirdim hızlıca.

b. Ben o adamı o doktora yönlendirdim hızlıca.

'I referred that man to that doctor quickly.'

Context:

Dün yoldan geçerken bir kalabalık gördük, merak edip durduk. Bir kaza olmuş, insanlar ne yapacağını bilmeden etrafta panik halde dolanıyordu. Ben de yardımcı olmak istedim.

'Yesterday, while we were walking down the street, we saw a crowd and became curious. There had been an accident, and people were wandering around in panic, not knowing what to do. I wanted to help.'

c. Ben bir doktora bir adamı yönlendirdim hızlıca.

d. Ben bir adamı bir doktora yönlendirdim hızlıca.

'I referred a man to a doctor quickly.'

Filler Sentences

(1)

Context:

Kardeşimle aynı yerde oturmuyoruz. Geçen gün onu çok özlediğimi fark ettim. Dayanamadım, hemen yola çıktım ve otobüse atladım.

'My brother and I do not live in the same place. The other day, I realized how much I missed him. I could not resist, so I immediately set off and got on a bus.'

a. Ben o otobüsle o kardeşimi ziyaret ettim hızlıca.

b. Ben o kardeşimi o otobüsle ziyaret ettim hızlıca.

'I quickly visited that brother by that bus.'

Context:

Sevdiğim insanlar genelde benden uzakta oturuyor bu sebeple onlarla çok sık

görüşemiyorum. Gitmek her zaman mümkün olmuyor ama geçen gün vakit yaratabildim.

'The people I care about usually live far away from me, so I cannot see them very often. It is not always possible to visit them, but the other day I managed to make some time.'

c. Ben bir otobüsle bir kardeşimi ziyaret ettim hızlıca.

d. Ben bir kardeşimi bir otobüsle ziyaret ettim hızlıca.

'I quickly visited a brother by a bus.'

(2)

Context:

Ev değiştirmeye karar verdim. Arkadaşımın oturduğu semte taşınmayı düşünüyorum. Diğer seçeneğim de annemlerin oturduğu mahalle. O yüzden artı eksi listesi yaptım.

'I decided to move. I am considering moving to the district where my friend lives. My other option is the neighbourhood where my parents live. Therefore, I made a list of advantages and disadvantages.'

a. Ben o mahalleyle o semti karşılaştırdım kolayca.

b. Ben o semti o mahalleyle karşılaştırdım kolayca.

'I easily compared that district with that neighbourhood.'

Context:

Artık buradan taşınmaya karar verdim. Birkaç seçeneğim var, geçen gün değerlendirme yaptım.

'I have decided to move away from here. I have several options, and the other day I evaluated them.'

c. Ben bir mahalleyle bir semti karşılaştırdım kolayca.

d. Ben bir semti bir mahalleyle karşılaştırdım kolayca.

'I easily compared a district with a neighbourhood.'

(3)

Context:

Amcam okumayı çok seven biridir. Her zaman elinde bir kitap olur. Ona geçenlerde bir kitap hediye etmiştim. Dün de yanına uğradım.

'My uncle loves reading. He always has a book in his hand. I gave him a book as a gift recently, and yesterday I visited him.'

a. Ben o kitapla o amcamı gördüm sessizce.

b. Ben o amcamı o kitapla gördüm sessizce.

'I quietly saw that uncle with that book.'

Context:

Babamın akrabalarının okuma yazma bilmediğini zannediyordum. Bu yüzden de geçen gün evde gördüğüm manzaraya çok şaşırdım.

'I used to think that my father's relatives were illiterate. Therefore, I was very surprised by what I saw at home the other day.'

c. Ben bir kitapla bir amcamı gördüm sessizce.

d. Ben bir amcamı bir kitapla gördüm sessizce.

'I quietly saw an uncle with a book.'

(4)

Context:

Dün satış departmanı için iş görüşmesine girdim. Görüşme oldukça iyi geçti. Bence öz geçmişimi ayrıntılı olarak incelemişler.

'Yesterday, I had a job interview for a position in the sales department. The interview went quite well. I think they examined my résumé in detail.'

a. Ben o öz geçmişle o işi aldım güzelce.

b. Ben o işi o öz geçmişle aldım güzelce.

'I got that job with that résumé beautifully.'

Context:

Aylardır iş görüşmesine girmekten yoruldum. Benim tecrübemi yeterli saymıyorlardı, ben de etik kuralları hiçe saydım. Kendi öz geçmişimi kullanmadım.

'I have become tired of attending job interviews for months. They did not consider my experience sufficient, so I ignored ethical rules and did not use my own résumé.'

c. Ben bir öz geçmişle bir işi aldım güzelce.

d. Ben bir işi bir öz geçmişle aldım güzelce.

'I got a job with a résumé beautifully.'

(5)

Context:

Geçen ay gittiğimiz restoran bence çok soğuktu, ben çok üşüdüm. Hem soba hem de odun olduğunu görünce şikâyette bulundum.

'I think the restaurant we visited last month was very cold. I was freezing. When I saw that there was both a stove and firewood available, I complained.'

a. Ben o odunla o sobayı yaktırdım gizlice.

b. Ben o sobayı o odunla yaktırdım gizlice.

'I had that stove lit with that firewood secretly.'

Context:

Ben çok kolay üşüyorum o yüzden bulunduğum ortam her zaman sıcak olmalı. Geçen hafta bir otele gittik. Otelin lobisi buz gibiydi. O soğuğa daha fazla dayanamadım.

'I get cold very easily, so the place I am in always needs to be warm. Last week we went to a hotel. The hotel lobby was freezing. I could not tolerate the cold any longer.'

c. Ben bir odunla bir sobayı yaktırdım gizlice.

d. Ben bir sobayı bir odunla yaktırdım gizlice.

'I had a stove lit with a piece of firewood secretly.'

(6)

Context:

Kardeşim temizlik işlerinde çok iyidir. Ona malzemeleri göstermen yeterli. Geçen gün benim evdeydi, ben de hemen viledanın yerini gösterdim.

'My brother is very good at cleaning. It is enough to show him the cleaning supplies. The other day he was at my house, and I immediately showed him where the mop was.'

a. Ben o viledayla o evi temizlettim düzgünce.

b. Ben o evi o viledayla temizlettim düzgünce.

'I had that house cleaned with that mop throughly.'

Context:

Temizlikten hiç anlamam, zaten yapmayı da hiç sevmem. O işleri bizim evde hep kardeşim yapar. Geçen hafta da mecbur kardeşimi çağırdım.

'I know nothing about cleaning, and I do not enjoy doing it. My brother usually takes care of such tasks in our family. Last week I had to call him again.'

c. Ben bir viledayla bir evi temizlettim düzgünce.

d. Ben bir evi bir viledayla temizlettim düzgünce.

'I had a house cleaned with a mop throughly.'

APPENDIX 4. MATERIALS OF EXPERIMENT 2

Experimental Sentences

(1)

Context:

Şuradaki evi görüyor musun? O ev benim arkadaşımın evi. Dün oraya gitmem gerekti çünkü ne zamandır ertelediğim yapmam gereken bir işim var.

'Do you see that house over there? That house belongs to my friend. Yesterday, I had to go there because I had a task that I had been postponing for a long time.'

a. Ben o eve bir koliyi taşıdım kolayca.

b. Ben bir koliyi o eve taşıdım kolayca.

'I carried a box to that house easily.'

Context:

Yardıma ihtiyacı olan insanlar için erzak kolisi hazırladım. Evdeki işe yarayabilecek her şeyi o kolinin içine koydum. Sonra nereye teslim edeceğimi bilemediğim için iş başa düştü.

'I prepared a relief package for people in need. I put everything useful from the house into that box. Then I had to decide where to deliver it myself.'

c. Ben bir eve o koliyi taşıdım kolayca.

d. Ben o koliyi bir eve taşıdım kolayca.

'I carried that box to a house easily.'

(2)

Context:

Bizim yandaki oturma odası çok soğuk oluyor. Özellikle çıplak yere basınca çocuklarda karın ağrısına da sebep oluyor. O yüzden geçici bir çözüm buldum.

'The living room next to ours is always very cold. Walking barefoot on the floor even causes stomach aches in children. Therefore, I came up with a temporary solution.'

a. Ben o odaya bir halıyı yaydım düzgünce.

b. Ben bir halıyı o odaya yaydım düzgünce.

'I neatly spread a carpet in that room.'

Context:

Bir tane el dokuması halım var. Zamanında çok para verip almıştım ama bir türlü kullanmak nasip olmadı. Artık zamanı geldi diye düşünüyorum.

'I own a handwoven carpet. I paid a lot of money for it, but I never had the opportunity to use it. I think its time has finally come.'

c. Ben bir odaya o halıyı yaydım düzgünce.

d. Ben o halıyı bir odaya yaydım düzgünce.

'I neatly spread that carpet in a room.'

(3)

Context:

Bir önceki çalıştığım yer bir köydü. Çok güzel bir yerdi ama artık görevimin sonuna geldim. Oradan ayrılmadan önce resmi işlerimin hepsini halledememiştim. Geçen gün mecburen bunlarla ilgilendim.

'The place where I previously worked was a village. It was a beautiful place, but my assignment there had come to an end. Before leaving, I had not completed all my official paperwork. The other day, I had to deal with it.'

a. Ben o köye bir belgeyi gönderdim güzelce.

b. Ben bir belgeyi o köye gönderdim güzelce.

'I properly sent a document to that village.'

Context:

Geçen ay patron bana bir görev verdi. Son güne kadar yapmayı erteledim ama

sonunda dün vakit bulup istediği belgeyi hazırlayabildim. Ondan sonra da hemen postaneye gittim.

'Last month, my boss assigned me a task. I postponed it until the last day, but yesterday I finally found time to prepare the document he requested. After that, I immediately went to the post office.'

c. Ben bir köye o belgeyi gönderdim güzelce.

d. Ben o belgeyi bir köye gönderdim güzelce.

'I properly sent that document to a village.'

(4)

Context:

Geçen hafta arkadaşlarla barınağa gittik. Orada bir grup öğrenciyle karşılaştık. Aralarında çok çekingen bir çocuk vardı. Onu rahatlatmak için bir şey yapmalıyım diye düşündüm.

'Last week, I went to an animal shelter with my friends. We met a group of students there. Among them was a very shy child. I thought I should do something to make him feel more comfortable.'

a. Ben o çocuğa bir kediyi uzattım sessizce.

b. Ben bir kediyi o çocuğa uzattım sessizce.

'I handed a kitten to that child quietly.'

Context:

Bu sabah ağaçta mahsur kalan bir kedi gördüm. İndirmeyi denedim ama kedi direndi. Mecburen ağaca tırmandım ve onu yakaladım. Aşağı indirebilmemin tek yolu vardı.

'This morning, I saw a kitten stranded in a tree. I tried to get it down, but it resisted. I had to climb the tree and catch it. There was only one way to bring it down safely.'

c. Ben bir çocuğa o kediyi uzattım sessizce.

d. Ben o kediyi bir çocuğa uzattım sessizce.

'I handed that kitten to a child quietly.'

(5)

Context:

Artık bazı restoranlara çocuklu aileler alınmıyormuş. Yemek yerken çocuk sesinin yüksek olmasından rahatsız olurum, o yüzden dün öyle bir restoran tercih ettim. İçeride her şeyden sorumlu bir görevli duruyordu.

'Apparently, some restaurants no longer admit families with children. I find loud children's voices disturbing while eating, so yesterday I chose such a restaurant. Inside, there was an employee responsible for everything.'

a. Ben o görevliye bir çocuğu gösterdim gizlice.

b. Ben bir çocuğu o görevliye gösterdim gizlice.

'I showed a child to that attendant secretly.'

Context:

Dün havaalanına gittiğimde çok kalabalıktı. O kadar kalabalığın arasında küçük bir çocuk gördüm. Çocuk nereye gideceğini bilmeden etrafta ağlayarak dolanıyordu. Kaybolduğunu düşündüm.

'When I went to the airport yesterday, it was extremely crowded. Among all those people, I noticed a small child. The child was wandering around crying and seemed lost. I thought he had lost his way.'

c. Ben bir görevliye o çocuğu gösterdim gizlice.

d. Ben o çocuğu bir görevliye gösterdim gizlice.

'I showed that child to an attendant secretly.'

(6)

Context:

Çok yakın bir arkadaşım var. Hayatta en çok korktuğu şey hızlı hareket eden küçük hayvanlarmış. Ben de şakacı bir tipimdir ve bazen yaptığım şakaların

dozunu ayarlayamıyorum. Geçen gün o arkadaşla dışarıda buluşmuştuk.

'I have a very close friend. The thing he fears most in life is small animals that move quickly. I am also a playful person and sometimes fail to control my jokes. The other day, I met that friend outside.'

a. Ben o arkadaşa bir böceği attım hızlıca.

b. Ben bir böceği o arkadaşa attım hızlıca.

'I quickly threw an insect at that friend.'

Context:

Evde iki gündür gezip duran bir böcek var. Sürekli görüyorum ama alıp dışarıya da atmadım. Geçen gün onunla bir şaka yapayım dedim.

'There has been an insect wandering around the house for the last two days. I keep seeing it, but I never bothered to take it outside. The other day, I decided to use it for a joke.'

c. Ben bir arkadaşa o böceği attım hızlıca.

d. Ben o böceği bir arkadaşa attım hızlıca.

'I quickly threw that insect at a friend.'

Filler Sentences

(1)

Context:

Dün fazla yağmur yağınca mahalledeki neredeyse her evi su bastı. Yan komşu tek başına evdeki suyu boşaltmaya çalışıyordu. Ben de yardımcı oldum.

'Yesterday, after heavy rainfall, nearly every house in the neighborhood was flooded. My next-door neighbor was trying to remove the water from the house by himself. I decided to help.'

a. Ben bir kovayla o evi boşalttım kolayca.

b. Ben o evi bir kovayla boşalttım kolayca.

'I emptied that house with a bucket easily.'

Context:

Geçen hafta her yeri su bastığından dolayı dün çok yorulduk. Etrafta evlerden su boşaltmak için kullanacağım hiçbir şey yoktu. Şans eseri şu köşedeki kovayı buldum.

'Because of the flooding last week, we were exhausted yesterday. There was nothing around that I could use to remove the water from the houses. Fortunately, I found a bucket in the corner.'

c. Ben o kovayla bir evi boşalttım kolayca.

d. Ben bir evi o kovayla boşalttım kolayca.

'I emptied a house with that bucket easily.'

(2)

Context:

Dün kiralayacağımız evi bulduk, fakat evin içi çok kirliydi. Etrafta evin içini temizleyebileceğim hiçbir şey bulamadım. En sonunda köşede duran küreği fark ettim.

'Yesterday, we found the house we were going to rent, but it was extremely dirty inside. I could not find anything to clean it with. Eventually, I noticed a shovel standing in the corner.'

a. Ben bir kürekle o evi temizledim düzgünce.

b. Ben o evi bir kürekle temizledim düzgünce.

'I properly cleaned that house with a shovel.'

Context:

Ben temizlik görevlisi olarak çalışıyorum. Geçen gün bir firmadan iş teklifi aldım. İnşaat pisliği temizlememiz gerekiyordu ve bize sadece şuradaki küreği verdiler.

'I work as a cleaner. The other day, I received a job offer from a company. We had to clean construction debris, and they only gave us that shovel.'

c. Ben o kürekle bir evi temizledim düzgünce.

d. Ben bir evi o kürekle temizledim düzgünce.

'I properly cleaned a house with that shovel.'

(3)

Context:

Arkadaşımın çocuğu acayip haylaz, hiç yerinde durmayan ve çok tembel bir çocuk. Geçen gün bakmam için bana bıraktılar.

'My friend's child is extremely mischievous, never sits still, and is very lazy. The other day, they left him with me to take care of.'

a. Ben bir oyunla o çocuğu oyaladım güzelce.

b. Ben o çocuğu bir oyunla oyaladım güzelce.

'I entertained that child well with a game.'

Context:

Çocukken en sevdiğim oyunlardan bir tanesi kendi kurduğum oyundu. Ben hâlâ bu oyunu çok seviyorum. Hatta geçen gün tekrar oynama şansı buldum.

'One of my favorite games as a child was a game that I had invented myself. I still love that game. In fact, I had the chance to play it again the other day.'

c. Ben o oyunla bir çocuğu oyaladım güzelce.

d. Ben bir çocuğu o oyunla oyaladım güzelce.

'I entertained a child well with that game.'

(4)

Context:

Geçen hafta okulda beden eğitimi öğretmeni izinliydi. Sevdiğim bir öğrenci boş derste ne yapacağını sormak için yanıma geldi.

'Last week, the physical education teacher was on leave. A student I liked came to me to ask what he should do during the free period.'

a. Ben bir topla o öğrenciyi gönderdim gizlice.

b. Ben o öğrenciyi bir topla gönderdim gizlice.

'I secretly sent that student away with a ball.'

Context:

Bizim okuldaki öğrenciler futbol maçı yapmayı çok seviyor. Benim de bir futbol topum var. Evde duruyordu, onu okula getirdim. Teneffüste öğrencileri yanıma çağırdım.

'The students at our school love playing football matches. I also have a football at home, so I brought it to school. During the break, I called the students over.'

c. Ben o topla bir öğrenciyi gönderdim gizlice.

d. Ben bir öğrenciyi o topla gönderdim gizlice.

'I secretly sent a student away with that ball.'

(5)

Context:

Her şeyi bir anda almam pek mümkün değil ama evin alınacaklarını yavaş yavaş tamamlamaya başladım. En büyük eksiğimiz bir fırındı, onu da dün aldık. Hatta dayanamadım hemen denedim.

'It is not possible for me to buy everything at once, but I have started completing the things needed for the house gradually. Our biggest missing item was an oven, and we bought it yesterday. I could not resist and tried it immediately.'

a. Ben bir fırınla o keki pişirdim hızlıca.

b. Ben o keki bir fırınla pişirdim hızlıca.

'I quickly baked that cake with an oven.'

Context:

Uzun zamandır denemek istediğim bir tencere keki var. Çok lezzetli görünüyor ama tencerede pişmesi bana çok saçma geldi. Dün denemeye karar verdim ama bir değişiklik yaptım.

'There is a pot cake that I have wanted to try for a long time. It looks very delicious, but baking it in a pot seemed very strange to me. Yesterday, I decided to try it, but

I made a change.'

c. Ben o fırınla bir keki pişirdim hızlıca.

d. Ben bir keki o fırınla pişirdim hızlıca.

'I quickly baked a cake with that oven.'

(6)

Context:

Babam beni av malzemeleri satan bir mağazaya götürdü ve bana pembe renkli bir olta aldı. Artık beraber balığa çıkabileceğimizi söyledi, ben de hemen gitmek istedim. Ertesi gün eve yakın bir göle gittik.

'My father took me to a store that sells fishing equipment and bought me a pink fishing rod. He said that we could now go fishing together, and I wanted to go immediately. The next day, we went to a lake near home.'

a. Ben bir balığı o oltayla tuttum sessizce.

b. Ben o oltayla bir balığı tuttum sessizce.

'I quietly caught a fish with that fishing rod.'

Context:

Pikniğe gittiğimiz yerde bir göl vardı. Gölün içi kocaman balıklarla doluydu. Amcam bu balıkların çok lezzetli olduğundan bahsetti. Biz de hemen gidip arabadan oltalarımızı aldık.

'There was a lake where we went for a picnic. The lake was full of huge fish. My uncle mentioned that those fish were very delicious, so we immediately went and took our fishing rods from the car.'

c. Ben bir oltayla o balığı tuttum sessizce.

d. Ben o balığı bir oltayla tuttum sessizce.

'I quietly caught that fish with a fishing rod.'

APPENDIX 5. MATERIALS OF EXPERIMENT 3

Experimental Sentences

(1)

Context:

Bu aralar çok sinirliyim. Dün akşam bir kitap okuyordum ve kitapta olanlar beni çok rahatsız etti. Bir anda rahatlama ihtiyacı duydum. Sanki tüm suçlu karşımdaki duvarmış gibi ondan intikam almak istedim.

'Lately I have been very irritated. Yesterday evening I was reading a book, and what happened in the book disturbed me greatly. Suddenly I felt the need for relief. It was as if the wall in front of me was responsible for everything, and I wanted to take revenge on it.'

a. Ben o duvara o keyifsiz ve kalın kitabı fırlattım hızlıca.

b. Ben o keyifsiz ve kalın kitabı o duvara fırlattım hızlıca.

'I threw that dull and thick book at that wall quickly.'

e. Ben karşımdaki o çok temiz duvara o kitabı fırlattım hızlıca.

f. Ben o kitabı karşımdaki o çok temiz duvara fırlattım hızlıca.

'I threw that book at the very clean wall in front of me quickly.'

Context:

Artık sinirlerime hâkim olamıyorum. Bazen kendimi kontrol edemiyorum ve bu beni korkutuyor. Geçen gün de durup dururken sinirlendim ve bir tepki verme ihtiyacı duydum.

'I can no longer control my temper. Sometimes I lose control of myself, and this frightens me. The other day I suddenly became angry and felt the need to react.'

c. Ben kalın ve ağır bir kitabı bir duvara fırlattım hızlıca.

d. Ben bir duvara kalın ve ağır bir kitabı fırlattım hızlıca.

'I threw a thick and heavy book at a wall quickly.'

g. Ben bir kitabı evdeki bomboş kıpkırmızı bir duvara fırlattım hızlıca.

h. Ben evdeki bomboş kıpkırmızı bir duvara bir kitabı fırlattım hızlıca.

'I threw a book at the completely empty bright-red wall at home quickly.'

(2)

Context:

Ben hatıralara önem veririm. Mesela bir tane ayrılık mektubu var ve onu da çöpe atamıyorum. Bu gördüğün kutuda tüm anılarımı topluyorum. Bir tek o mektup ayrı yerde duruyormuş.

'I value memories. For example, I have a breakup letter that I cannot bring myself to throw away. I keep all my memories in this box you see here. Only that letter was stored elsewhere.'

a. Ben o kutuya o tatsız ve acımasız mektubu koydum düzgünce.

b. Ben o tatsız ve acımasız mektubu o kutuya koydum düzgünce.

'I put that unpleasant and cruel letter into that box properly.'

e. Ben tüm anılarımla dolu o kutuya o mektubu koydum düzgünce.

f. Ben o mektubu tüm anılarımla dolu o kutuya koydum düzgünce.

'I put that letter into the box full of my memories properly.'

Context:

Dün annemin evini düzenledik. Annem de tam bir istifçiymiş, evden neler neler çıktı. Neyse ki en sona kalan iş çok kolaydı.

'Yesterday we organized my mother's house. It turned out that she was quite a hoarder, and we found all kinds of things. Fortunately, the last task was very easy.'

c. Ben bir kutuya annemin anılarıyla dolu bir mektubu koydum düzgünce.

d. Ben annemin anılarıyla dolu bir mektubu bir kutuya koydum düzgünce.

'I put a letter full of my mother's memories into a box properly.'

g. Ben gizli saklı köşedeki bir kutuya bir mektubu koydum düzgünce.

h. Ben bir mektubu gizli saklı köşedeki bir kutuya koydum düzgünce.

'I put a letter into a box hidden away in a corner properly.'

(3)

Context:

Bu evde depolama alanı çok kısıtlı. Mesela benim odamdaki yeşil dolap var ya ağzına kadar dolu. Şu gördüğün battaniye ortalıkta duruyordu. Kendimce bu dağınıklığa bir çözüm bulmaya çalıştım.

'Storage space in this house is very limited. For example, the green wardrobe in my room is completely full. The blanket you see here was lying around. I tried to find a solution to this mess.'

a. Ben o dolaba o eski püskü yırtık battaniyeyi tıktım güzelce.

b. Ben o eski püskü yırtık battaniyeyi o dolaba tıktım güzelce.

'I carefully stuffed that old and torn blanket into that wardrobe.'

e. Ben tüm rafları dolu o dolaba o battaniyeyi tıktım güzelce.

f. Ben o battaniyeyi tüm rafları dolu o dolaba tıktım güzelce.

'I carefully stuffed that blanket into the wardrobe whose shelves were already full.'

Context:

Dün evde temizlik vardı. Annemle tüm evi detaylıca temizledik. Sonra etrafta kalan bir şey, bir dağınıklık var mı diye evi kontrol ettik ve tabii ki buldum.

'Yesterday we cleaned the house thoroughly with my mother. Afterwards, we checked whether anything was left lying around, and of course I found something.'

c. Ben bir dolaba el örgüsü şık bir battaniyeyi tıktım güzelce.

d. Ben el örgüsü şık bir battaniyeyi bir dolaba tıktım güzelce.

'I carefully stuffed a stylish hand-knitted blanket into a wardrobe.'

g. Ben içi zaten dolu bir dolaba bir battaniyeyi tıktım güzelce.

h. Ben bir battaniyeyi içi zaten dolu bir dolaba tıktım güzelce.

'I carefully stuffed a blanket into a wardrobe that was already full.'

(4)

Context:

Dün yüzbaşıyla birlikte nöbet yerlerini dolaşıyorduk. Baktık ki bir yerde nöbet tutması gereken asker yerinde değil. Bizim bölük komutanı sert biridir ve bu askerle zaten arası kötü.

'Yesterday I was inspecting guard posts with the captain. We noticed that a soldier who was supposed to be on duty was absent. Our company commander is a strict person, and he already has a bad relationship with this soldier.'

a. Ben o komutana o asi ve disiplinsiz askeri yolladım kolayca.

b. Ben o asi ve disiplinsiz askeri o komutana yolladım kolayca.

'I easily sent that rebellious and undisciplined soldier to that commander.'

e. Ben o saygıdeğer ama sert komutana o askeri yolladım kolayca.

f. Ben o askeri o saygıdeğer ama sert komutana yolladım kolayca.

'I easily sent that soldier to that respected but strict commander.'

Context:

Alayda geçen gün yetenek belirlemek için bir anket uyguladık. Sonra da cevaplara göre anketin analizini yapıp görev atamalarını yapmak bana düştü. Ben de uygun olduğunu düşündüğüm eşleştirmeleri yaptım.

'The other day we conducted a survey in the regiment to identify abilities. Afterwards, it was my responsibility to analyze the results and assign duties. I made the pairings that I considered appropriate.'

c. Ben bir komutana becerikli ve çalışkan bir askeri yolladım kolayca.

d. Ben becerikli ve çalışkan bir askeri bir komutana yolladım kolayca.

'I easily sent a skilled and hardworking soldier to a commander.'

g. Ben alaydaki matematikte uzman bir komutana bir askeri yolladım kolayca.

h. Ben bir askeri alaydaki matematikte uzman bir komutana yolladım kolayca.

'I easily sent a soldier to a commander who specializes in mathematics within the regiment.'

(5)

Context:

Geçen gün şirkette bir toplantı oldu. Üst yöneticimiz şirketteki düzenden sorumlu olarak görev alacak birini aradığından bahsetti. Hemen aklıma şirketteki en güvenilir eleman olan arkadaş geldi.

'The other day, there was a meeting at the company. Our senior manager mentioned that he was looking for someone to take responsibility for order in the company. I immediately thought of my friend, who is the most reliable employee in the company.'

a. Ben o yöneticiye her konuya hâkim o arkadaşı önerdim sessizce.

b. Ben her konuya hâkim o arkadaşı o yöneticiye önerdim sessizce.

'I quitely recommended that friend who is knowledgeable about every issue to that manager.'

e. Ben şirketten sorumlu o üst yöneticiye o arkadaşı önerdim sessizce.

f. Ben o arkadaşı şirketten sorumlu o üst yöneticiye önerdim sessizce.

'I quitely recommended that friend to the senior manager responsible for the company.'

Context:

Şirkette çok fazla düzensizlik problemi var. Çalışanların çoğu ne yapacağını bilmiyor ve bilenler de işlerini yapmıyor. Bunları denetleyip düzenleyen birine ihtiyaç olduğunu düşünüyorum. Geçen hafta bir çözüm bulmak adına bir adım attım.

'There are many problems of disorder in the company. Most employees do not know what to do, and those who know do not do their jobs. I think someone is needed to supervise and organize these issues. Last week, I took a step toward finding a solution.'

c. Ben bir yöneticiye bu işlerde başarılı bir arkadaşı önerdim sessizce.

d. Ben bu işlerde başarılı bir arkadaşı bir yöneticiye önerdim sessizce.

'I quitely recommended a friend who is successful in these matters to a manager.'

g. Ben açık fikirli bir üst yöneticiye bir arkadaşı önerdim sessizce.

h. Ben bir arkadaşı açık fikirli bir üst yöneticiye önerdim sessizce.

'I quitely recommended a friend to an open-minded senior manager.'

(6)

Context:

Dün burada çok ciddi bir olay oldu, fakat kimse bir şey bilmiyor. Şurada duran genç polis dün de buradaydı. Suçlu bizim mahalledenmiş, herkesin tanıdığı biri diye söylediler. Ben de dayanamayıp o polise yaklaştım.

'Yesterday, a very serious incident happened here, but no one knows anything. The young police officer standing over there was also here yesterday. They said that the criminal was from our neighborhood and was someone everyone knew. I could not help myself and approached that police officer.'

a. Ben o polise dünkü olaydaki o manyak suçluyu sordum gizlice.

b. Ben dünkü olaydaki o manyak suçluyu o polise sordum gizlice.

'I secretly asked that police officer about that crazy criminal involved in yesterday's incident.'

e. Ben şuradaki o yetkili genç polise o suçluyu sordum gizlice.

f. Ben o suçluyu şuradaki o yetkili genç polise sordum gizlice.

'I secretly asked that authorized young police officer over there about that criminal.'

Context:

Geçen ay öğretmenimiz bize çok ilginç bir ödev verdi. Polislerin yaşadıkları zorluklar, bulundukları durumlar hakkında bilgi toplamamızı istedi. Ödev için röportaj yapmamız gerekti.

'Last month, our teacher gave us a very interesting assignment. She asked us to collect information about the difficulties police officers experience and the situations they face. We had to conduct an interview for the assignment.'

c. Ben bir polise psikolojik sorunlu azılı bir suçluyu sordum gizlice.

d. Ben psikolojik sorunlu azılı bir suçluyu bir polise sordum gizlice.

'I secretly asked a police officer about a dangerous criminal with psychological problems.'

g. Ben hırsızlık alanındaki uzman bir polise bir suçluyu sordum gizlice.

h. Ben bir suçluyu hırsızlık alanındaki uzman bir polise sordum gizlice.

'I secretly asked a police officer specializing in theft about a criminal.'

Filler Sentences

(1)

Context:

Dün okula giderken yeni aldığım kalemtıraşımı da götürmek istedim. Evde kalemtıraşı çok aradım ve sonunda buldum. İyi ki götürmüşüm çünkü okuldaki kalemimin ucu körelmiş.

'Yesterday, I wanted to take the pencil sharpener I had recently bought to school. I searched for it at home and finally found it. Fortunately, I took it with me because the tip of my pencil at school had become dull.'

a. Ben bıçakları keskin o yeni kalemtıraşla o kalemi açtım düzgünce.

b. Ben o kalemi bıçakları keskin o yeni kalemtıraşla açtım düzgünce.

'I sharpened that pencil with that new pencil sharpener with sharp blades properly.'

e. Ben o kalemtıraşla okuldaki siyah uçlu o kalemi açtım düzgünce.

f. Ben okuldaki siyah uçlu o kalemi o kalemtıraşla açtım düzgünce.

'I sharpened that black-tipped pencil at school with that pencil sharpener properly.'

Context:

Dün okula gittiğimde yapmam gereken çok işim vardı. Bu işleri yapabilmek için

öncelikle ucu sivri bir kaleme ihtiyaç duydum. Bütün odayı aradım ve sonunda aradığımı buldum.

'Yesterday, when I arrived at school, I had many things to do. In order to complete these tasks, I first needed a pencil with a sharp tip. I searched the whole room and finally found what I was looking for.'

c. Ben yeni ve kullanışlı bir kalemtıraşla bir kalemi açtım düzgünce.

d. Ben bir kalemi yeni ve kullanışlı bir kalemtıraşla açtım düzgünce.

'I sharpened a pencil with a new and useful pencil sharpener properly.'

g. Ben bir kalemtıraşla ucu körelmiş kırmızı bir kalemi açtım düzgünce.

h. Ben ucu körelmiş kırmızı bir kalemi bir kalemtıraşla açtım düzgünce.

'I sharpened a red pencil with a dull tip with a pencil sharpener properly.'

(2)

Context:

Tatildeyken giyeceğim çok şık kırmızı renkli bir kıyafet hazırlamıştım. Bu kıyafetin de ütülenmesi gerekiyordu. Hemen otel odasını aradım ve eski ama çalışır bir ütü buldum.

'I had prepared a very stylish red outfit to wear during the holiday. This outfit needed to be ironed. I immediately searched the hotel room and found an old but working iron.'

a. Ben bulduğum çalışır durumdaki o ütüyle o kıyafeti düzelttim güzelce.

b. Ben o kıyafeti bulduğum çalışır durumdaki o ütüyle düzelttim güzelce.

'I neatly fixed that outfit with that working iron I found.'

e. Ben o ütüyle bugün giyeceğim o güzel kıyafeti düzelttim güzelce.

f. Ben bugün giyeceğim o güzel kıyafeti o ütüyle düzelttim güzelce.

'I neatly fixed that beautiful outfit I would wear today with that iron.'

Context:

Dün evden çok acele çıktım, o yüzden de konferans için çok hazırlık yapamadım.

Yanıma hemen birkaç parça bir şey almıştım. Otele yerleşince yanıma aldıklarıma baktım. Hepsi de ütüsüzmüş.

'Yesterday, I left home in a hurry, so I could not prepare much for the conference. I quickly took a few things with me. When I settled into the hotel, I checked the things I had brought. All of them were unironed.'

c. Ben oteldeki çok eski bir ütüyle bir kıyafeti düzelttim güzelce.

d. Ben bir kıyafeti oteldeki çok eski bir ütüyle düzelttim güzelce.

'I neatly fixed an outfit with a very old iron at the hotel.'

g. Ben bir ütüyle akşam için hazırladığım bir kıyafeti düzelttim güzelce.

h. Ben akşam için hazırladığım bir kıyafeti bir ütüyle düzelttim güzelce.

'I neatly fixed an outfit I had prepared for the evening with an iron.'

(3)

Context:

Teslim etmem gereken bir rapor var ama buraya bilgisayarımı getirmeyi unutmuşum. Raporun aciliyeti olduğu için işteki yedek bilgisayarlardan birini aldım.

'I had a report that I needed to submit, but I forgot to bring my computer here. Since the report was urgent, I used one of the spare computers at work.'

a. Ben işte yıllardır duran o bilgisayarla o raporu hazırladım gizlice.

b. Ben o raporu işte yıllardır duran o bilgisayarla hazırladım gizlice.

'I secretly prepared that report with that computer that had been at work for years.'

e. Ben o bilgisayarla başımın belası olan o raporu hazırladım gizlice.

f. Ben başımın belası olan o raporu o bilgisayarla hazırladım gizlice.

'I secretly prepared that troublesome report with that computer.'

Context:

Tatildeyken de yapmam gereken işler bitmedi. Aksi gibi tatile çok hazırlıksız gelmişim ama neyse ki arkadaşımın evinde kalıyorum.

'Even during the holiday, the work I had to do was not finished. Unfortunately, I

had come to the holiday very unprepared, but luckily I was staying at my friend's house.'

c. Ben arkadaşıma ait hızlı bir bilgisayarla bir raporu hazırladım gizlice.

d. Ben bir raporu arkadaşıma ait hızlı bir bilgisayarla hazırladım gizlice.

'I secretly prepared a report with a fast computer belonging to my friend.'

g. Ben bir bilgisayarla son dakika çıkan bir raporu hazırladım gizlice.

h. Ben son dakika çıkan bir raporu bir bilgisayarla hazırladım gizlice.

'I secretly prepared a last-minute report with a computer.'

(4)

Context:

Dün belim ağrımaya başladı ve yanımda da iyi gelecek hiçbir şey olmadığı fark ettim. Sonra çantamın derinliklerinden baş ağrısı için kullandığım ilacımı buldum.

'Yesterday my back started to hurt, and I realized that I did not have anything with me that could help. Then I found the medicine that I usually use for headaches at the bottom of my bag.'

a. Ben başımın ağrısını geçiren o ilaçla o ağrıyı geçirdim kolayca.

b. Ben o ağrıyı başımın ağrısını geçiren o ilaçla geçirdim kolayca.

'I easily relieved that pain with the medicine that relieves my headaches.'

e. Ben o ilaçla tüm gün geçmeyen o ağrıyı geçirdim kolayca.

f. Ben tüm gün geçmeyen o ağrıyı o ilaçla geçirdim kolayca.

'I easily relieved that pain that had lasted all day with that medicine.'

Context:

Geçen haftadan beri vücudumdaki ağrılar bitmedi. Her gün başka bir yerim ağrıyor ama en kötüsü perşembe günüydü. Hafifletmek için her yolu denedim.

'The pains in my body have not gone away since last week. Every day a different part of my body hurts, but Thursday was the worst. I tried everything to ease it.'

c. Ben çocukluğumdan beri kullandığım bir ilaçla bir ağrımı geçirdim kolayca.

d. Ben bir ağrımı çocukluğumdan beri kullandığım bir ilaçla geçirdim kolayca.

'I easily relieved a pain with a medicine that I have been using since childhood.'

g. Ben bir ilaçla dizimin kenarındaki sancılı bir ağrıyı geçirdim kolayca.

h. Ben dizimin kenarındaki sancılı bir ağrıyı bir ilaçla geçirdim kolayca.

'I easily relieved a painful ache near my knee with a medicine.'

(5)

Context:

Bu aralar durumum pek iyi değil. Elektrik faturamı kaç aydır ödeyemiyorum. En sonunda biriktirdiğim paraya başvurmak zorunda kaldım.

'Things have not been going very well for me lately. I have not been able to pay my electricity bill for months. Eventually, I had to use the money I had been saving.'

a. Ben uzun zamandır biriktirdiğim o parayla o faturayı ödedim sessizce.

b. Ben o faturayı uzun zamandır biriktirdiğim o parayla ödedim sessizce.

'I quietly paid that bill with the money I had been saving for a long time.'

e. Ben o parayla yüksek meblağlı birikmiş o faturayı ödedim sessizce.

f. Ben yüksek meblağlı birikmiş o faturayı o parayla ödedim sessizce.

'I quietly paid that accumulated high-cost bill with that money.

Context:

İşten atıldığımdan beri maddi olarak kendime yetemiyorum. Başkalarına yük olmak çok zor geliyor ama yapabileceğim başka bir şey de yok sanırım. Mesela geçen gün çok utandığım bir şey yapmak zorunda kaldım.

'Since I lost my job, I have not been financially self-sufficient. Depending on others is very difficult for me, but I do not think I have any other choice. For example, the other day I had to do something that made me very embarrassed.'

c. Ben annemden aldığım bir miktar parayla bir faturayı ödedim sessizce.

d. Ben bir faturayı annemden aldığım bir miktar parayla ödedim sessizce.

'I quietly paid a bill with some money I borrowed from my mother.'

g. Ben borç parayla günlük giderlerime ait bir faturayı ödedim sessizce.

h. Ben günlük giderlerime ait bir faturayı borç parayla ödedim sessizce.

'I quietly paid a bill related to my daily expenses with borrowed money.'

(6)

Context:

Arabam 2005 yılından beri benimle birlikte. Artık iyice eskidi ve sık sık beni yarı yolda bırakıyor. Geçen gün de yolda kaldık, neyse ki tanıdığım çekici vardı.

'My car has been with me since 2005. It has become quite old and often breaks down. The other day it broke down again, but fortunately I knew a tow-truck driver.'

a. Ben komşumuzun arkadaşına ait o çekiciyle o arabamı getirdim hızlıca.

b. Ben o arabamı komşumuzun arkadaşına ait o çekiciyle getirdim hızlıca.

'I brought my car with that tow truck belonging to our neighbour's friend quickly.'

e. Ben o çekiciyle yılların emekçisi o canım arabamı getirdim hızlıca.

f. Ben yılların emekçisi o canım arabamı o çekiciyle getirdim hızlıca.

'I brought my beloved car, which has served me for years, with that tow truck quickly.'

Context:

Evde otururken birden telefonum çaldı. Arayan ev arkadaşlarımdı ve benden bir ricada bulundu. Kendisi şehirde değilmiş ve kuzeni arabasını kullanırken yolda kalmış. Arabayı alıp eve getirmemi istedi.

'While I was sitting at home, my phone suddenly rang. It was my roommates calling with a favour to ask. They were out of town, and their cousin had broken down while driving the car. They asked me to bring the car home.'

c. Ben internetten araştırıp bulduğum bir çekiciyle bir arabayı getirdim hızlıca.

d. Ben bir arabayı internetten araştırıp bulduğum bir çekiciyle getirdim hızlıca.

'I brought a car with a tow truck that I found through an internet search quickly.'

g. Ben bir çekiciyle arkadaşıma ait lüks bir arabayı getirdim hızlıca.

h. Ben arkadaşıma ait lüks bir arabayı bir çekiciyle getirdim hızlıca.

'I brought my friend's luxury car with a tow truck quickly.'

APPENDIX 6. MATERIALS OF EXPERIMENT 4

Experimental Sentences

(1)

Context:

Dün okulda bir çocuk düştü. Sınıf öğretmeni bu olayın nasıl olduğunu anlamak için çok çabaladı ama kimse öğretmene olayı anlatmak istemedi. Ben de oradaydım.

'Yesterday, a child fell down at school. The classroom teacher tried very hard to understand what had happened, but nobody wanted to explain the incident to the teacher. I was there as well.'

a. Ben o öğretmene o olayı anlattım güzelce.

b. Ben o olayı o öğretmene anlattım güzelce.

'I explained that incident to that teacher thoroughly.'

Context:

Bizim oğlanın bazı problemleri var. Kendim çözemeyeceğime karar verdim ve bu yüzden okuluna gittim. En azından yaşananlarla ilgili içimi dökmüş oldum.

'My son has some problems. I decided that I could not solve them on my own, so I went to his school. At least I had the chance to talk about what had happened.'

c. Ben bir öğretmene bir olayı anlattım güzelce.

d. Ben bir olayı bir öğretmene anlattım güzelce.

'I explained an incident to a teacher thoroughly.'

(2)

Context:

Tezimle ilgili bir konu yüzünden geceleri gözüme uyku girmez oldu. Ben de yardım almaya karar verdim. Bizim alanda çalışan tanıdığım bir hoca var, ona sormaya karar verdim. Dün yanına gittim.

'Because of an issue related to my thesis, I have not been able to sleep at night. I

decided to seek help. There is a professor I know who works in my field, and I decided to ask for advice. I visited him yesterday.'

a. Ben o hocaya o konuyu danıştım düzgünce.

b. Ben o konuyu o hocaya danıştım düzgünce.

'I discussed that issue with that professor thoroughly.'

Context:

Aslında her gün üniversitede olmam gerekmiyor ama dün gitmemin bazı sebepleri vardı. Ofiste bıraktığım bir kitabımı almam gerekiyordu. Sonra bir durum gelişti ve bu sebeple başka bir bölüme de uğramam gerekti.

'I do not actually need to be at the university every day, but I had several reasons to go there yesterday. I needed to pick up a book that I had left in my office. Then something came up, and I had to visit another department as well.'

c. Ben bir hocaya bir konuyu danıştım düzgünce.

d. Ben bir konuyu bir hocaya danıştım düzgünce.

'I discussed an issue with a professor thoroughly.'

(3)

Context:

Dün en üst yöneticimle toplantım vardı. Bu yöneticimi çok severim ama aynı zamanda çok da geriliyorum önünde. Hazırlamam gereken de bir rapor vardı. Kaç gündür ona hazırlandım ama yine de çok heyecanlandım.

'Yesterday I had a meeting with my senior manager. I like this manager very much, but I also get very nervous in front of him. I also had a report that I needed to present. I had been preparing for it for days, but I was still very excited.'

a. Ben o yöneticiye o raporu sundum hızlıca.

b. Ben o raporu o yöneticiye sundum hızlıca.

'I presented that report to that manager quickly.'

Context:

Geçen hafta işte çok yoğun bir haftaydı. Birçok iş hallettim. Köklü değişimlere gidiyoruz iş yerinde. Benim de bu değişimlerde bir katkım olsun istiyorum. O yüzden üzerime düşeni ben de yaptım.

'Last week was a very busy week at work. I completed many tasks. We are going through major changes at the workplace. I wanted to contribute to these changes, so I did my part as well.'

c. Ben bir yöneticiye bir raporu sundum hızlıca.

d. Ben bir raporu bir yöneticiye sundum hızlıca.

'I presented a report to a manager quickly.'

(4)

Context:

Yan komşunun tavşanına çok üzülüyorum. Hiçbir yerde gezmesine izin vermiyorlar. Evlerinin önündeki bahçede gezebilir aslında ama onu bile problem ediyorlar. Karışmamalıyım diye düşündüm ama geçen gün onlardayken dayanamadım.

'I feel sorry for my neighbour's rabbit. They never let it roam around. It could easily wander in the garden in front of their house, but even that is considered a problem. I thought I should not interfere, but I could not resist the other day when I was visiting them.'

a. Ben o bahçeye o tavşanı saldım gizlice.

b. Ben o tavşanı o bahçeye saldım gizlice.

'I secretly released that rabbit into that garden.'

Context:

Geçen gün köye gittik, baktım tüm hayvanları kümeslere tıkmışlar. Çok üzüldüm bu duruma ve bir şey yapmam gerekiyormuş gibi hissettim. Gece herkes uyuduğunda dışarı çıktım.

'The other day we went to the village, and I saw that all the animals had been

confined to pens. I felt very sorry about the situation and felt that I had to do something. I went outside after everyone had fallen asleep.'

c. Ben bir bahçeye bir tavşanı saldım gizlice.

d. Ben bir tavşanı bir bahçeye saldım gizlice.

'I secretly released a rabbit into a garden.'

(5)

Context:

Ben çocukken hep bir kedim olsun istedim ama annem hiç izin vermezdi. Bir gün sokaktan aldığım bir kediyi eve getirdim ama annemden de korktum. O yüzden odamdaki yeterli büyüklükteki bir kutuyu kediye yuva yaptım.

'When I was a child, I always wanted to have a cat, but my mother never allowed it. One day I brought home a cat that I had found on the street, but I was afraid of my mother finding out. Therefore, I turned a suitably sized box in my room into a shelter for the cat.'

a. Ben o kutuya o kediyi sakladım sessizce.

b. Ben o kediyi o kutuya sakladım sessizce.

'I quietly hid that cat in that box.'

Context:

Geçen gün sokak hayvanlarını toplamak için etrafta belediyenin bir aracı geziyordu. O zavallı hayvanların barınaklarda ne şartlarda yaşadığını hepimiz biliyoruz. Bu yüzden ben de buna engel olmak istedim.

'The other day, a municipal vehicle was collecting stray animals in the area. We all know the conditions under which those poor animals live in shelters. Therefore, I wanted to prevent it.'

c. Ben bir kutuya bir kediyi sakladım sessizce.

d. Ben bir kediyi bir kutuya sakladım sessizce.

'I quietly hid a cat in a box.'

(6)

Context:

Dün bizim iş yerinde bir hırsızlık girişimi oldu. Bir elinde silahla orta boylu kumral bir adam içeriye daldı ve bütün herkesi tehdit etti. O sırada arkadaşlardan biri adamı etkisiz hale getirdi. Hemen adamı odamdaki şu masanın yanına götürdük ve ben koşup bir halat getirdim.

'Yesterday there was an attempted robbery at our workplace. A medium-height, brown-haired man entered with a gun and threatened everyone. One of my colleagues managed to subdue him. We immediately took him next to the table in my office, and I ran to get a rope.'

a. Ben o masaya o adamı bağladım kolayca.

b. Ben o adamı o masaya bağladım kolayca.

'I easily tied that man to that table.'

Context:

Geçen gün hiç tanımadığım insanlarla çok saçma bir etkinliğe katıldım. Etkinlikte bir oyun oynanıyordu ve bu oyunda iki grup vardı. Oyunun amacı karşı grubun üyelerini etkisiz hale getirip bir yere sabitlemekti. Mecburen ben de oyuna katıldım.

'The other day I participated in a rather silly activity with people I had never met before. There was a game with two teams. The aim was to immobilize members of the opposing team and secure them somewhere. I had no choice but to take part as well.'

c. Ben bir masaya bir adamı bağladım kolayca.

d. Ben bir adamı bir masaya bağladım kolayca.

'I easily tied a man to a table.'

Filler Sentences

(1)

Context:

İnternette sokak hayvanlarına yardım amaçlı oyuncak satılıyordu. Ben de bizim mahalledeki sevimli ve dost canlısı yavru köpek için bir tane aldım. Dün sokakta yürürken onu gördüm.

'There were toys being sold online to help stray animals. I bought one for the cute and friendly puppy in our neighborhood. Yesterday, I saw him while walking down the street.'

a. Ben o oyuncakla o köpeği oynattım sessizce.

b. Ben o köpeği o oyuncakla oynattım sessizce.

'I quietly entertained that puppy with that toy.'

-

Context:

Hayvanları mutlu etmeyi insanları mutlu etmekten daha çok seviyorum. Çünkü bence onlar insanlardan daha masum. Bazen sokağa çıkıp sokak hayvanlarıyla vakit geçiriyorum. Geçen gün de öyle yaptım.

'I enjoy making animals happy more than making people happy. I think they are more innocent than people. Sometimes I go outside and spend time with stray animals. I did the same thing the other day.'

c. Ben bir oyuncakla bir köpeği oynattım sessizce.

d. Ben bir köpeği bir oyuncakla oynattım sessizce.

'I quietly entertained a puppy with a toy.'

(2)

Context:

Dün okulda deney için laboratuvara girdik. Her masanın üzerinde bir kap bir de kırmızı renkli bir sıvı vardı. Öğretmenimiz aşamaları anlattı, biz de sırayla bunları yaptık.

'Yesterday we went into the laboratory for an experiment. On every table there was a container and a red liquid. Our teacher explained the steps, and we carried

them out one by one.'

a. Ben o sıvıyla o kabı doldurdum düzgünce.

b. Ben o kabı o sıvıyla doldurdum düzgünce.

'I carefully filled that container with that liquid.'

Context:

Geçen hafta fen bilimleri dersinde yine deney yaptık ve çok eğlenceliydi. Öğretmenimiz bizi gruplara ayırdı ve gruptaki her üyenin üzerine düşen bir görev vardı. Bana kolay bir görev denk geldi.

'Last week we conducted another science experiment, and it was very enjoyable. Our teacher divided us into groups, and each member of the group had a task. I was assigned an easy one.'

c. Ben bir sıvıyla bir kabı doldurdum düzgünce.

d. Ben bir kabı bir sıvıyla doldurdum düzgünce.

'I carefully filled a container with a liquid.'

(3)

Context:

Geçen gün tadilatın ortasında ev sahibimiz eve habersiz geldi. Evin salonu çok boş görünüyordu, o yüzden birkaç Table almıştık. Çivi ve çekiç de salon masasının üzerinde duruyordu o esnada. Görünce hemen itiraz etti ama bu sefer ev sahibini dinlemedim.

'The other day, our landlord arrived unexpectedly in the middle of the renovation. The living room looked very empty, so we had bought a few paintings. At that moment, a nail and a hammer were lying on the table. He immediately objected when he saw them, but this time I did not listen to him.'

a. Ben o çekiçle o çiviyi çaktım gizlice.

b. Ben o çiviyi o çekiçle çaktım gizlice.

'I secretly hammered that nail with that hammer.'

Context:

Geçen gün yeni aldığımız eve uğradık. Yapılması gereken işler hâlâ bitmedi. Ama ben genelde dekorasyon kısmıyla ilgileniyorum. Süslemeyle ilgili işleri kendim yapmaya karar verdim. Hatta gitmişken işe bile koyuldum.

'The other day we visited the house we had recently bought. There was still work left to do. I usually take care of decoration-related tasks, so I decided to handle them myself. In fact, I started working on them right away.'

c. Ben bir çekiçle bir çiviyi çaktım gizlice.

d. Ben bir çiviyi bir çekiçle çaktım gizlice.

'I secretly hammered a nail with a hammer.'

(4)

Context:

Dün kışlada yapılacak çok iş vardı. Özellikle tüm kolileri kilere taşıma işi hiç kolay değildi. Mecburen en güçlü görünen askere bu görevi yükledim.

'Yesterday there was a lot of work to be done at the barracks. Especially carrying all the boxes to the storage room was not easy. I had no choice but to assign the task to the strongest-looking soldier.'

a. Ben o işle o askeri yordum hızlıca.

b. Ben o askeri o işle yordum hızlıca.

'I quickly exhausted that soldier with that task.'

Context:

Maalesef kışlada yapılması gerekenler hiç bitmiyor. Bazen acımasızca davranmak zorunda kalıyorum ama bu benim elimde değil. Geçen gün de bir duruma çok üzüldüm mesela.

'Unfortunately, the work that needs to be done at the barracks never ends. Sometimes I have to act harshly, but it is beyond my control. For example, the other day I felt very sorry about a situation.'

c. Ben bir işle bir askeri yordum hızlıca.

d. Ben bir askeri bir işle yordum hızlıca.

'I quickly exhausted a soldier with a task.'

(5)

Context:

Benim izlemekten asla bıkmadığım bir film var. En yakın arkadaşım izlememiş bu filmi. Ben de hemen o arkadaşımı birlikte izlemeye ikna ettim.

'There is a movie that I never get tired of watching. My best friend had never seen it. I immediately convinced my friend to watch it with me.'

a. Ben o filmle o arkadaşı tanıştırdım güzelce.

b. Ben o arkadaşı o filmle tanıştırdım güzelce.

'I properly introduced that friend to that movie.'

Context:

En sevdiğim şey insanlara yeni bir şey kazandırmaktır. Bu yüzden de çevremdekiler bana çok saygı duyar. Mesela geçen gün de şöyle bir şey oldu.

'My favorite thing is introducing people to new experiences. That is why people around me respect me. For example, something like this happened the other day.'

c. Ben bir filmle bir arkadaşı tanıştırdım güzelce.

d. Ben bir arkadaşı bir filmle tanıştırdım güzelce.

'I properly introduced a friend to a movie.'

(6)

Context:

Geçen günkü iş görüşmesine çok iyi hazırlanmıştım. Özellikle müdürün nelerden etkilenebileceğini iyi araştırdım. Görüşmeyi sonlandırırken neden beni seçmelerinin iyi olacağına dair bir söz hazırlamıştım.

'I had prepared very well for the job interview the other day. In particular, I carefully researched what might impress the manager. Before ending the interview, I had

prepared a statement about why choosing me would be a good decision.'

a. Ben o sözle o müdürü etkiledim kolayca.

b. Ben o müdürü o sözle etkiledim kolayca.

'I easily impressed that manager with that statement.'

Context:

Çalıştığım yerde her zaman tanınan ve takdir edilen biri olmuşumdur ve bunun için de çok çaba gösteririm. Geçen bir toplantı esnasında yine kendimi göstermeyi başardım.

'I have always been a recognized and appreciated person where I work, and I put a lot of effort into maintaining that reputation. During a meeting the other day, I once again managed to stand out.'

c. Ben bir sözle bir müdürü etkiledim kolayca.

d. Ben bir müdürü bir sözle etkiledim kolayca.

'I easily impressed a manager with a statement.'

APPENDIX 7. INFORMED CONSENT FORM

GÖNÜLLÜ KATILIMCI FORMU

Sayın katılımcı,

Bu çalışma Hacettepe Üniversitesi İngiliz Dilbilimi öğretim üyesi Doç. Dr. Emine Yarar yönetiminde "Türkçedeki Çift Nesneli Yapılarda Nesne Sıralaması Değiştiriminin İşlemlenmesi" adlı doktora tezi için yapılmaktadır. Türkçede çift nesne alan yapılardaki nesnelerin farklı sıralarda yer alması mümkündür fakat hangi sıralamanın Türkçe anadil konuşucusu tarafından daha kolay işlemlendiği bir soru işaretidir. Bu sebeple bu araştırmanın amacı Türkçede çift nesne alan yapıların nesne sıralamasının işlemlenmesini incelemektir. Deney süresince katılımcılardan kısa paragraflar okumaları ve devamında gelen cümlenin Türkçede kabul edilebilir bir cümle olup olmadığını değerlendirmeleri istenmektedir. Çalışma bilgisayar ekranı üzerinden gerçekleştirilecek ve katılımcılar değerlendirmeleri klavyede belirlenen tuşlara basarak gerçekleştireceklerdir. Katılımcıların tümceler hakkındaki değerlendirmeleri kullanılan bilgisayar programı aracılığıyla kaydedilecek ve çalışma sonunda toplanan veriler incelenerek Türkçedeki çift nesneli cümlelerde nesne sıralaması hakkında bulgulara ulaşılacaktır. Bu çalışma için Hacettepe Üniversitesi'nden izin alınmıştır.

Çalışmaya katılım gönüllülük esasına dayalıdır. Bu sebeple çalışmaya katılmama veya katıldıktan sonra herhangi bir anda çalışmayı bırakma hakkına sahipsiniz, bunun için çalışmanın herhangi bir aşamasında çıkış 'esc' tuşuna basıp çalışmayı bitirebilirsiniz. Çalışma yaklaşık olarak 20 dakika sürecek 4 ayrı bölümden oluşmaktadır. Katılımcıların dört deneye de katılımları beklenmektedir fakat katılımcı diğer deneylere katılmak istemediği takdirde önceki deneylerde vermiş olduğu yanıtlar da yok edilecek ve değerlendirmeye alınmayacaktır.

Bu çalışmadan elde edilecek bilgiler tamamen bilimsel araştırma amacı ile değerlendirilecek olup kişisel bilgileriniz gizli tutulacaktır.

Onay vermeden önce aklınıza gelen veya gelecek olan sorularınızı çekinmeden sorabilirsiniz. Çalışma bittikten sonra da bize aşağıdaki telefon ya da e-posta ile ulaşarak sorularınızı sorabileceğinizi ve sonuçlar hakkında bilgi isteyebileceğinizi unutmayın.

Tarih:

Katılımcı:

Adı, soyadı:
Adres:

Tel:

Araştırmacı:

Adı, soyadı: Buse Şen Erdoğan

Adres:

Tel:

e-posta:
İmza:

APPENDIX 8. LOG-TRANSFORMED LMEM RESULTS

Table 1. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 1

Fixed Effects

Region	Estimate	SE	t	p
Subject	-0.0143	0.0152	-0.941	.347
DAT	-0.0553	0.0169	-3.269	.001**
ACC	0.0719	0.0167	4.301	<.001***
Verb	0.0040	0.0167	0.239	.811
Adv.	0.0081	0.0166	0.489	.625
Total RT	0.0070	0.0141	0.494	.622

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.02871	0.1695	0.00000	0.0000	0.04872	0.2207
DAT	0.04278	0.2068	0.00099	0.0315	0.06306	0.2511
ACC	0.04580	0.2140	0.00000	0.0000	0.06092	0.2468
Verb	0.04905	0.2215	0.00261	0.0511	0.06030	0.2456
Adv.	0.03252	0.1803	0.00047	0.0217	0.06028	0.2455

Total RT	0.04367	0.2090	0.00024	0.0154	0.04353	0.2086

Table 2. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 1 Inanimate Condition

Region	Estimate	SE	t	p
Subject	-0.038	0.023	-1.647	.101
DAT	-0.076	0.024	-3.122	.002**
ACC	0.089	0.025	3.577	<.001***
Verb	-0.035	0.025	-1.383	.168
Adv.	0.009	0.024	0.390	.697
Total RT	0.003	0.023	0.118	.906

Table 3. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 1 Animate Condition

Fixed Effects

Region	Estimate	SE	t	p
Subject	0.009	0.021	0.410	.682
DAT	-0.038	0.025	-1.509	.132
ACC	0.058	0.024	2.379	.018*
Verb	0.047	0.025	1.895	.059
Adv.	0.015	0.025	0.615	.539

Total RT	0.036	0.024	1.527	.128

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.02459	0.1568	0.00000	0.0002	0.04453	0.2110
DAT	0.03794	0.1948	0.00000	0.0000	0.06624	0.2574
ACC	0.04705	0.2169	0.00031	0.0176	0.05901	0.2429
Verb	0.04640	0.2154	0.00631	0.0794	0.06159	0.2482
Adv.	0.03129	0.1769	0.00118	0.0344	0.06322	0.2514
Total RT	0.06271	0.2504	0.00164	0.0405	0.05958	0.2441

Table 4. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 2

Fixed Effects

Region	Estimate	SE	t	p
Subject	0.006	0.015	0.421	.674
DAT	-0.060	0.016	-3.766	<.001***
ACC	0.049	0.016	3.108	.002**
Verb	-0.012	0.016	-0.745	.457

Adv.	0.000	0.014	0.024	.981
Total RT	-0.014	0.013	-1.114	.266

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.03377	0.1838	0.00002	0.0050	0.04445	0.2108
DAT	0.05001	0.2236	0.00012	0.0111	0.05425	0.2329
ACC	0.04511	0.2124	0.00037	0.0193	0.05242	0.2290
Verb	0.05449	0.2334	0.00002	0.0048	0.05393	0.2322
Adv.	0.03712	0.1927	0.00015	0.0123	0.04496	0.2120
Total RT	0.04724	0.2174	0.00019	0.0139	0.03554	0.1885

Table 5. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 2 Given Accusative Condition

Fixed Effects

Region	Estimate	SE	t	p
Subject	-0.006	0.021	-0.270	.787
DAT	-0.033	0.024	-1.382	.168
ACC	0.055	0.020	2.699	.007**

Verb	-0.021	0.024	-0.873	.383
Adv.	-0.017	0.021	-0.840	.402
Total RT	-0.003	0.022	-0.156	.876

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.02917	0.1708	0.00020	0.0140	0.04428	0.2104
DAT	0.05725	0.2393	0.00115	0.0339	0.05779	0.2404
ACC	0.04776	0.2186	0.00103	0.0320	0.04094	0.2023
Verb	0.05670	0.2381	0.00274	0.0523	0.05696	0.2387
Adv.	0.03956	0.1989	0.00000	0.0000	0.04219	0.2054
Total RT	0.08056	0.2838	0.00069	0.0264	0.05033	0.2244

Table 6. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 2 Given Dative Condition

Fixed Effects

Region	Estimate	SE	t	p
Subject	0.017	0.022	0.777	.438
DAT	-0.093	0.022	-4.137	<.001***

ACC	0.044	0.025	1.800	.073
Verb	-0.005	0.022	-0.221	.825
Adv.	0.010	0.021	0.496	.620
Total RT	0.001	0.023	0.061	.951

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.03044	0.1745	0.00000	0.0000	0.04812	0.2194
DAT	0.03904	0.1976	0.00008	0.0091	0.05150	0.2269
ACC	0.04153	0.2038	0.00001	0.0038	0.06197	0.2489
Verb	0.04716	0.2172	0.00020	0.0142	0.05198	0.2280
Adv.	0.03351	0.1831	0.00034	0.0183	0.04608	0.2147
Total RT	0.07066	0.2658	0.00054	0.0233	0.05642	0.2375

Table 7. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 3

Fixed Effects

Region	Estimate	SE	t	p
Subject	-0.003	0.011	-0.234	.815

DAT	-0.116	0.029	-4.050	<.001***
ACC	0.138	0.025	5.453	<.001***
Verb	0.007	0.012	0.592	.554
Adv.	-0.017	0.011	-1.520	.129
Total RT	-0.004	0.010	-0.389	.697

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.03150	0.1775	0.00003	0.0055	0.05036	0.2244
DAT	0.03444	0.1856	0.00058	0.0241	0.37358	0.6112
ACC	0.02955	0.1719	0.00420	0.0648	0.28880	0.5374
Verb	0.02995	0.1731	0.00064	0.0253	0.06537	0.2557
Adv.	0.03328	0.1824	0.00000	0.0000	0.05297	0.2302
Total RT	0.04330	0.2081	0.00231	0.0480	0.04462	0.2112

Table 8. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 3 Long Accusative Condition

Fixed Effects

Region	Estimate	SE	t	p

Subject	-0.005	0.015	-0.333	.739
DAT	-0.211	0.021	-10.140	<.001***
ACC	0.010	0.021	0.488	.626
Verb	0.024	0.016	1.475	.141
Adv.	-0.018	0.015	-1.166	.244
Total RT	-0.045	0.014	-3.160	.002**

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.03095	0.1759	0.00028	0.0169	0.04967	0.2229
DAT	0.06269	0.2504	0.00220	0.0469	0.10079	0.3175
ACC	0.06205	0.2491	0.01794	0.1339	0.09585	0.3096
Verb	0.02927	0.1711	0.00000	0.0000	0.05810	0.2410
Adv.	0.03044	0.1745	0.00000	0.0000	0.05303	0.2303
Total RT	0.06166	0.2483	0.00406	0.0637	0.04784	0.2187

Table 9. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 3 Long Dative Condition

Fixed Effects

Region	Estimate	SE	t	p

Subject	0.002	0.016	0.141	.888
DAT	-0.022	0.024	-0.916	.360
ACC	0.259	0.020	12.790	<.001***
Verb	-0.011	0.018	-0.623	.534
Adv.	-0.017	0.015	-1.105	.270
Total RT	0.033	0.015	2.182	.029*

Random Effects

Region	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.02954	0.1719	0.00000	0.0000	0.05145	0.2268
DAT	0.07421	0.2724	0.01012	0.1006	0.12334	0.3512
ACC	0.06007	0.2451	0.00247	0.0497	0.09551	0.3091
Verb	0.03213	0.1792	0.00124	0.0353	0.06976	0.2641
Adv.	0.03501	0.1871	0.00020	0.0142	0.05247	0.2291
Total RT	0.06472	0.2544	0.00477	0.0691	0.05412	0.2327

Table 10. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 4

Fixed Effects

Measure	Estimate	SE	t	p
Subject	-0.00859	0.01461	-0.588	0.557
DAT	-0.03958	0.01552	-2.550	0.011*
ACC	+0.07112	0.01550	+4.590	<0.001***
Verb	-0.02694	0.01552	-1.736	0.083
Adv.	-0.01120	0.01466	-0.764	0.445
Total RT	+0.00515	0.01344	+0.383	0.702

Random Effetcs

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.02853	0.1689	0.00000	0.0000	0.04533	0.2129
DAT	0.05009	0.2238	0.00146	0.0382	0.05251	0.2292
ACC	0.04298	0.2073	0.00052	0.0228	0.05162	0.2272
Verb	0.04224	0.2055	0.00082	0.0287	0.05126	0.2264
Adv.	0.03412	0.1847	0.00007	0.0087	0.04643	0.2155
Total RT	0.03965	0.1991	0.00034	0.0184	0.03925	0.1981

Table 11. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 3 Animate Accusative Condition

Fixed Effects

Measure	Estimate	SE	t	p
Subject	-0.00572	0.01685	-0.339	0.734
DAT	-0.03625	0.01723	-2.104	0.0357*
ACC	+0.07352	0.01817	+4.046	<0.001***
Verb	-0.01054	0.01923	-0.548	0.584
Adv.	-0.00626	0.01822	-0.343	0.731
Total RT	+0.00901	0.01454	+0.620	0.536

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.06599	0.2569	0.00000	0.0000	0.06606	0.2570
DAT	0.08011	0.2830	0.00151	0.0389	0.06902	0.2627
ACC	0.07520	0.2742	0.00102	0.0319	0.07679	0.2771
Verb	0.08350	0.2890	0.00015	0.0124	0.08600	0.2932
Adv.	0.06634	0.2576	0.00061	0.0246	0.07721	0.2779
Total RT	0.07394	0.2719	0.00026	0.0161	0.04915	0.2217

Table 12. Linear Mixed-Effects Model Results Based on Log-Transformed Reading Times for Experiment 3 Animate Dative Condition

Fixed Effects

Measure	Estimate	SE	t	p
Subject	-0.05321	0.02110	-2.521	0.0122*
DAT	-0.06182	0.02193	-2.819	0.00515**
ACC	+0.08232	0.02378	+3.461	0.000616***
Verb	-0.03193	0.02417	-1.321	0.188
Adv.	-0.00771	0.02236	-0.345	0.731
Total RT	-0.00331	0.02023	-0.163	0.870

Random Effects

Measure	Part. Var.	Part. SD	Sent. Var.	Sent. SD	Resid. Var.	Resid. SD
Subject	0.02897	0.1702	0.00000	0.0000	0.04321	0.2079
DAT	0.05307	0.2304	0.00004	0.0066	0.04780	0.2186
ACC	0.04070	0.2017	0.00063	0.0250	0.05595	0.2365
Verb	0.04166	0.2041	0.00162	0.0402	0.05799	0.2408
Adv.	0.03351	0.1831	0.00051	0.0226	0.04925	0.2219
Total RT	0.07851	0.2802	0.00027	0.0164	0.04310	0.2076