AN INVESTIGATION OF SYNTACTIC, MORPHOLOGICAL, AND SEMANTIC CUES IN PROCESSING SLUICING IN TURKISH

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in Processing Sluicing in Turkish

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- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
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ABSTRACT

An Investigation of Syntactic, Morphological, and Semantic Cues

in Processing Sluicing in Turkish

This study investigated cue-based retrieval during the processing of sluicing dependencies in Turkish, examining the effect of similarity-based interference from syntactically, morphologically, and semantically similar distractors in antecedent retrieval. It also examined the roles of linear and syntactic distance. The methodology involved two eye-tracking experiments and a sentence completion task. The eye-tracking experiments investigated the effects of morphological and semantic similarity and the influence of linear and syntactic distance on antecedent retrieval during the real-time processing of sluicing. The sentence completion task assessed how linear and syntactic distance influenced sentence-final judgments of antecedent preferences. Results from the eye-tracking experiments revealed an increased processing difficulty for linearly and syntactically distant antecedents in real-time processing of sluicing. Results also showed that morphologically similar distractors often facilitated processing, particularly when the target was less accessible, and primarily in the earlier stages of processing. In contrast, semantically similar distractors generally had an inhibitory effect, which mostly emerged later. The sentence completion task further demonstrated sensitivity to linear and syntactic distance, with participants showing a higher preference for linearly and syntactically closer antecedents in sentence-final interpretations. Overall, the findings aligned with the predictions of the cue-based memory retrieval model (Lewis & Vasishth, 2005) and extended them to the processing of sluicing in Turkish.

ÖZET

Türkçede Eksiltili Cümleciklerin İşlenmesinde Sözdizimsel, Morfolojik ve Anlamsal İpuçlarının İncelenmesi

Bu çalışma, Türkçede eksiltili cümleciklerin gerçek zamanlı işlenmesi sırasında ipucu tabanlı geri çağırmayı (Lewis & Vasishth, 2005) incelemiş ve öncül geri çağrılmasında sözdizimsel, morfolojik ve anlamsal olarak benzer çeldiricilerden kaynaklanan benzerlik temelli müdahalenin etkisini araştırmıştır. Ayrıca, öncül geri çağrılmasında lineer ve sözdizimsel mesafenin rolü de incelenmiştir. Çalışmanın yöntemi, iki göz izleme deneyi ve bir cümle tamamlama görevini içermektedir. Göz izleme deneylerinde, eksiltili cümleciklerin gerçek zamanlı işlenmesinde morfolojik ve anlamsal benzerliğin etkileri ile lineer ve sözdizimsel mesafenin rolü incelenmiştir. Cümle tamamlama görevinde ise öncülün lineer ve sözdizimsel mesafesinin, cümle sonu yargılarında öncül tümcecik tercihlerini nasıl etkilediği araştırılmıştır. Göz izleme deneylerinin sonuçları, lineer ve sözdizimsel mesafenin öncülün geri çağrılmasını zorlaştırdığını ortaya koymuştur. Ayrıca, anlamsal benzerliği yüksek çeldiricilerin çoğunlukla geç safhalarda işlemeyi zorlaştırdığı, morfolojik benzerliği yüksek çeldiricilerin ise özellikle hedef sözcüğün ulaşılabilirliğinin düşük olduğu bağlamlarda ve çoğunlukla erken safhalarda işlemeyi kolaylaştırdığı bulunmuştur. Cümle tamamlama görevinin sonuçları ise katılımcıların cümle sonu yargılarında daha yakın mesafeli öncülleri tercih ederek lineer ve sözdizimsel uzaklığa duyarlılık gösterdiğini ortaya koymuştur. Bulgular, ipucu tabanlı geri çağırma modeli (Lewis & Vasishth, 2005) tarafından yapılan öngörüleri Türkçedeki eksiltili cümleciklerin işlenmesine dair verilerle desteklemiştir.

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ABBREVIATIONS

*	ungrammatical
1	first person
3	third person
ABL	ablative
ACC	accusative
COMP	complementizer
DAT	dative
EVID.PST	evidential past tense
F	feminine gender
GEN	genitive
M	masculine gender
NEG	negation
NMLZ	nominalizer
NOM	nominative
PRES	present tense
PL	plural
POSS	possessive
PROG	progressive
PST	past tense
REL	relative
SG	singular

CHAPTER 1

INTRODUCTION

1.1 Introduction

This thesis investigates the processing of sentences with long-distance dependencies resulting from sluicing and focuses on syntactic, morphological, and semantic retrieval cues, as well as the influence of linear and syntactic distance during processing. Processing sentences often involves interpreting syntactic dependencies formed across words and phrases which are sometimes non-adjacent to one another. Such non-adjacent dependencies are called long-distance dependencies. To process long-distance dependencies, a language user must form a mental representation of previously processed constituents, recognize the retrieval site of the dependency, and subsequently access, retrieve, and incorporate the dependent constituents into the structure currently being processed. According to the cue-based retrieval model, the processing of long-distance dependencies involves a direct-access and associative retrieval mechanism (McElree et al., 2003; Lewis & Vasishth, 2005; Lewis et al., 2006). Associative direct-access retrieval allows cues at the retrieval site to match the content of the memory representations of the stored items. This means that the dependent constituents of a long-distance dependency can be retrieved directly based on the overlap between the cues at the retrieval site and the content of stored items in a parallel fashion, without requiring a serial search through previously encountered items (see Van Dyke & Johns, 2012 for a review).

This study focuses on how sluicing is processed in Turkish, specifically examining the cues involved in retrieving dependents within sluicing dependencies. Sluicing, first described by Ross (1969), is an interesting linguistic phenomenon that

involves omitting a part of a sentence, typically following a *wh*-phrase, where the missing information can be inferred from the context, as illustrated in (1).

(1) Somebody just left – guess who <~~just left~~>.

(Ross, 1969, p. 252)

The evident ease with which sluicing sentences are comprehended raises important questions about the underlying mechanisms that enable language users to interpret incomplete clauses as fully structured questions. Investigations on the processing of sluicing dependencies provide a unique context to test the predictions of retrieval-based accounts, as it differs from other frequently studied dependencies, such as filler-gap and subject-verb dependencies, which typically involve anticipatory mechanisms (e.g., Martin & McElree, 2011; Harris, 2015; Lawn & Harris, 2019). For subject-verb dependencies, the subject must be syntactically integrated with an agreeing verb. In filler-gap dependencies, the filler has no function within the sentence until the gap site is correctly identified. These types of dependencies often allow the parser to anticipate the upcoming constituents as the sentence unfolds. Specifically, for subject-verb agreement or filler-gap dependencies, the parser may hold these anticipated constituents in a specialized buffer, ready to be used as cues for direct-access retrieval operations. Sluicing dependencies, however, involve retrieval *in situ* in which the parser cannot anticipate the upcoming dependency until it reaches the retrieval site of the dependency (Martin & McElree, 2011). This is because a syntactically complete structure can already be formed with the constituents of the sentence processed before reaching the retrieval site. For this reason, sluicing dependencies offer a valuable opportunity to investigate the retrieval-based mechanisms involved in processing long-distance dependencies while minimizing the influence of anticipation or predictive processing mechanisms.

In a previous study, Martin and McElree (2011) investigated cue-based retrieval in sluicing sentences with two structurally licensed antecedents, only one of which was acceptable for the sluice. They used speed-accuracy tradeoff (SAT) and eye-tracking experiments to examine how distance and the number of potential antecedents influenced the retrieval of the target antecedent. They hypothesized that having two potential antecedent sites would create similarity-based interference, increasing the difficulty of the retrieval of the correct antecedent. Their SAT results showed that having two syntactically accessible antecedent sites led to decreased accuracy, suggesting an effect of similarity-based interference from having a second potential antecedent. Moreover, the participants' retrieval speed was not influenced, supporting a direct-access retrieval approach.

Since English lacks a rich case-marking system, prior research on cue-based retrieval in sluicing processing in English (e.g., Martin & McElree, 2011) has largely concentrated on manipulating the number of antecedents and correlates alongside their relative distance to the retrieval site without considering the role of morphosyntactic and semantic cues. The present study explores the role of syntactic, morphological, and semantic cues, along with the effect of linear and syntactic distance, in the processing of sluicing in Turkish—a language with a rich case-marking system and highly flexible word order that allows for a more comprehensive analysis of these features. Syntactic as well as morphological and semantic cues were manipulated in the present study since they may be critical for the accurate retrieval of the correlates and antecedents in sluicing dependencies, as these features could provide necessary linguistic conditions for antecedent identification (e.g., Chung et al., 1995; Merchant, 2001).

The study included two eye-tracking experiments and one sentence completion task. Eye-tracking experiment 1 investigated the processing sluicing dependencies in Turkish, focusing on the morphological and semantic cues involved in antecedent retrieval and the effect of linear distance. Eye-tracking experiment 2 examined the processing sluicing dependencies in Turkish, focusing on the morphological cues involved in antecedent retrieval and the impact of syntactic distance. The sentence completion task tested how the linear and syntactic distance affected participants' end-of-sentence judgments regarding their preferences for antecedents in globally ambiguous sluicing dependencies with two potential antecedents. The results provided evidence for the significant role of syntactic, morphological, and semantic cues in the online processing of sluicing dependencies in Turkish. The findings also showed that both linear and syntactic distance significantly influenced antecedent retrieval and the effect of similarity-based interference during the processing of sluicing dependencies. Additionally, the results revealed that semantic and morphosyntactic cues may function differently due to variations in the cognitive mechanisms underlying their integration. Moreover, the typological properties of languages can also influence how different types of cues are prioritized during sentence processing.

1.2 Organization of the thesis

This thesis is organized into four more chapters. Chapter 2 explores the cue-based retrieval mechanism, a foundational model for understanding how long-distance dependencies are processed during sentence comprehension. It reviews the theoretical models and empirical findings related to cue-based retrieval, with a

specific focus on how different types of cues are employed during the retrieval of memory representations in long-distance dependency processing.

Chapter 3 focuses on sluicing and its processing. It begins with a general examination of sluicing as a syntactic phenomenon, defining its structural aspects. It then focuses on how sluicing operates in Turkish, discussing language-specific features and differences. The chapter reviews prior research on sluicing processing and investigates the relationship between cue-based retrieval and sluicing, focusing on the role of various retrieval cues in resolving sluicing dependencies.

Chapter 4 describes the experimental studies conducted in this study, divided into three sections, each dedicated to a separate experiment. Experiments 1 and 2 employ eye-tracking methodology. Experiment 1 examines how morphological and semantic cues, along with the effect of linear distance, influence the processing of sluicing dependencies in Turkish. Experiment 2 examines how morphological cues and syntactic distance influence the processing of sluicing dependencies in Turkish. The third experiment, a sentence completion task, investigates the impact of linear and syntactic distance on participants' end-of-sentence judgments for antecedent attachment in sluicing dependencies. Each section presents a detailed methodology, analysis, and discussion of findings, providing evidence and insights into the role of retrieval cues and linear and syntactic distance in the processing of sluicing.

Finally, Chapter 5 synthesizes the findings from the three experiments, discussing their implications for cue-based retrieval and sluicing processing. This chapter also reviews the study's contributions, compares its findings with previous research, and suggests directions for future work, summarizing the study's overall impact and offering conclusions about the role of retrieval cues and distance in sluicing processing in Turkish.

CHAPTER 2

CUE-BASED MEMORY RETRIEVAL

Processing sentences often requires successfully interpreting dependencies formed across words and phrases which are sometimes non-adjacent to one another. For example, to successfully interpret the sluiced interrogative clause *who* ___ in (1a) and (1b) as "*who sang*", the verb *sang* must be retrieved from the earlier context and integrated with the *wh*-phrase *who*. To achieve this integration, comprehenders must retrieve the tense phrase (TP) *someone sang* as the antecedent of the sluicing at the retrieval site, the *wh*-phrase *who*, despite the presence of intervening constituents (e.g., *the student danced*) which can interfere with the retrieval of the target TP *someone sang,* resulting in comprehension difficulties.

(1)

a. *Someone sang* and the student danced but I don't know *who* ___.

b. The student danced and *someone sang* but I don't know *who* ___.

Historically, the majority of the research investigating the relationship between memory and language focused on working memory capacity to explain the comprehension difficulties arising in the processing of long-distance dependencies (e.g., Just & Carpenter, 1992; Gibson, 1998; 2000). These accounts relied on the argument that working memory capacity, in general, is limited, and processing can fail when the amount of information that needs to be actively held in memory exceeds the working memory capacity (Miller, 1956; Gibson, 1998; 2000). In capacity-based theories, memory failure primarily results from decay caused by an increased memory load. The main prediction is that processing long-distance dependencies becomes more difficult as the distance between the target and the

retrieval site increases because when the number of intervening materials between the target and the retrieval site increases, so does the cognitive load on working memory (Gibson, 1998; 2000).

More recent approaches investigating the relationship between memory and language have focused on retrieval-based accounts, with the cue-based memory retrieval account being the most influential one (Lewis & Vasishth, 2005; Van Dyke & McElree, 2011). This account proposes that memory retrieval operates through content-addressable cues, enabling direct access to memory representations but leaving retrieval vulnerable to decay and interference, particularly when distractors share features with the target. The following sections present the cue-based memory retrieval model, reviewing theoretical frameworks and empirical findings, with an emphasis on how different types of cues—syntactic, morphological, and semantic—are utilized in the retrieval of memory representations during long-distance dependency processing.

2.1 The cue-based memory retrieval model

The cue-based memory retrieval model by Lewis and Vasishth (2005) is a computational model of sentence processing that focuses on the general principles of memory and cognitive mechanisms in its examination of the processing of long-distance dependencies. The cue-based memory retrieval model maintains that sentence processing involves an associative, content-based retrieval of memory items that operate under limited attentional resources (Lewis & Vasishth, 2005; Lewis et al., 2006). In this model, the lexical items encountered in a sentence are represented in memory by their feature contents (e.g., number, case, syntactic category, and semantic features). Since working memory capacity is limited, each item is not

actively maintained in working memory. Instead, sentence processing involves a series of retrievals of the previously stored representations for integrating each newly encountered item with the preceding structure. These retrievals involve parallel associative access for the feature contents of the previously encoded representations based on the retrieval cues provided by the currently encountered item. The retrieval cues correspond to a subset of features that the item to be retrieved must contain. Figure 1 below illustrates the processing of subject-verb dependencies in the cue-based memory retrieval model, using the example of how the verb *arrived* triggers the access and retrieval of its subject, *the toy*, through a feature-match between the retrieval cues of the probe (i.e., the verb) and the target (i.e., the subject).

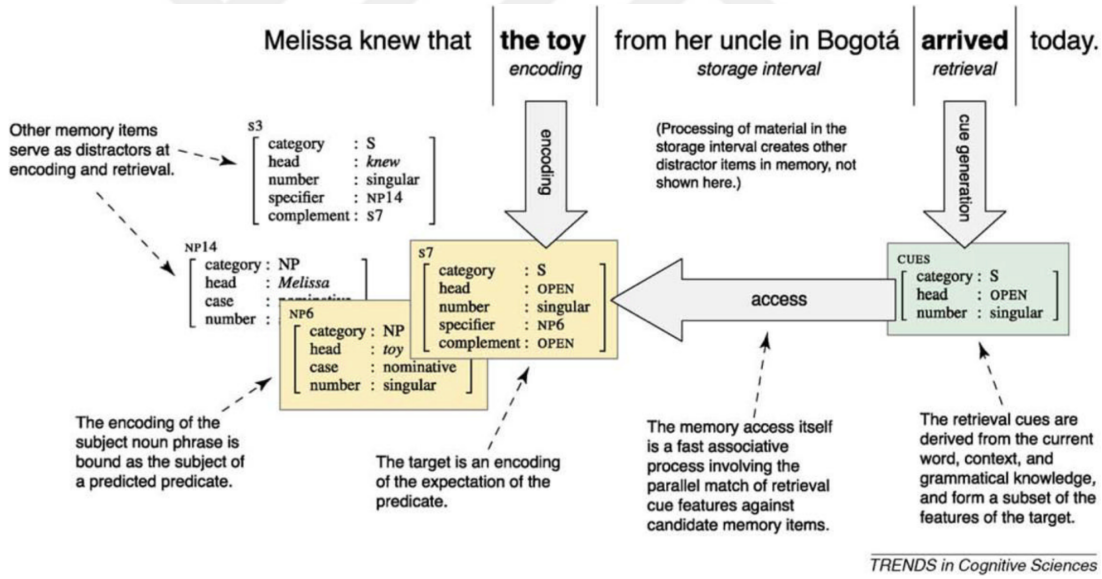

Figure 1. Processing of long-distance subject-verb dependencies in the cue-based memory retrieval model (taken from Lewis et al., 2006, p. 448)

In the cue-based memory retrieval model, the processing of long-distance dependencies is primarily influenced by two key factors: activation decay and similarity-based interference (Lewis & Vasishth, 2005). Activation-based decay occurs as memory representations become less accessible over time. That is, after the first encounter with an item in a sentence, its activation in memory decays over time

and with the processing of subsequent items in the sentence. Thus, it assumes that more recent items are more easily retrieved and the retrieval of items in a long-distance dependency could be influenced by the linear distance separating the target and the probe (Lewis & Vasishth, 2005).

Similarity-based interference arises from the presence of items that share certain linguistic cues and compete for limited attentional and retrieval resources (Lewis & Vasishth, 2005). When multiple items in memory share similar features or retrieval cues, a condition of *cue-overload* arises, where the overlapping cues lead to competition among the memory representations. Similarity-based interference makes it more challenging to accurately retrieve the target item, as available cues may activate incorrect or irrelevant memory traces if they match other items as well as, or better than, the intended target (McElree, 2000; Van Dyke & Lewis, 2003; Lewis & Vasishth, 2005; Van Dyke, 2007; Van Dyke & McElree, 2011).

In cue-based memory retrieval, activation-based decay and similarity-based interference are assumed to affect the accuracy of retrieval rather than its speed. This is because cue-based memory retrieval allows for direct and parallel access to relevant information based on content, eliminating the need for a sequential memory scan to locate the target. In this way, the cue-based mechanism contrasts with serial search models, which predict that retrieval speed would decrease as the amount of intervening information increases, making longer distances slower to process (e.g., McElree, 2001; McElree & Dosher, 1993). Instead, in the cue-based framework, retrieval cues provide immediate access to memory representations through a fast associative content-addressable retrieval. Consequently, retrieval speed is predicted to remain unaffected by linear distance, while accuracy may decline as a function of

activation-based decay or similarity-based interference (Van Dyke & Lewis, 2003; Lewis & Vasishth, 2005).

There are two extensively investigated variates of similarity-based interference: *retroactive interference* and *proactive interference*. Retroactive interference arises when a target item is followed by cue-matching distractor items, as in (1a), where the target TP *someone sang* precedes a potentially similar, cue-matching item, e.g., the TP *the student danced*. Proactive interference arises when the target item follows the cue-matching distractor items that are similar to the target in their associated cues, as in (1b), where the target TP *someone sang* follows a potentially similar, cue-matching item, e.g., the TP *the student danced*.

In their influential study, Gordon et al. (2002) examined proactive interference by employing a memory load paradigm in a self-paced reading experiment. Participants were instructed to memorize a list of words before reading the sentence, and upon encountering the sentence, they were required to respond to comprehension questions and then retrieve the previously memorized items. Using sentences like (2), they manipulated the type of noun phrases (NPs) in the memory load and the sentences (common or proper nouns) as well as the similarity between the type of NPs in the word list and those in the sentences[1]. The type of NPs in the memory load either matched or mismatched the type of the NPs in the sentences, resulting in two conditions. In the Matching Memory Load condition as in (2a), both the NPs in the sentence and those in the word list were of the same type—either all

[1] They also manipulated sentence type, comparing object-cleft and subject-cleft sentences. In subject-cleft sentences, an NP modified by a subordinate clause is extracted from the subject position, whereas in object-cleft sentences, it is extracted from the object position. As their findings on similarity-based interference were consistent across both sentence types, only object-cleft sentences are shown in (5) for illustration.

proper nouns or all common nouns[2]. In contrast, the Mismatching Memory Load condition as exemplified in (2b) featured dissimilar NP types, with one group containing proper nouns (e.g., *Joel, Greg, Andy*) while the other group included common nouns (e.g., *the dancer, the fireman*).

(2)

a. Matching Memory Load: Joel-Greg-Andy

   It was *Tony* that *Joey liked* before the argument began.

b. Mismatching Memory Load: Joel-Greg-Andy

   It was *the dancer* that *the fireman liked* before the argument began.

(Gordon et al., 2002, p. 427)

They predicted that a match between the memory load and the NPs in the sentence would create processing difficulty during sentence comprehension. That is, retrieving the object (e.g., *Joey*) in (2a) to correctly comprehend the clefted verb *liked* would be challenging due to increased interference from similar items in the memory load (e.g., *Joel, Greg, Andy*) as compared to retrieving the object (e.g., *the dancer*) in (2b). As predicted, they observed increased processing difficulty for the sentences with a matching memory load as in (2a) compared to the sentences with a mismatching memory load as in (2b). This was observed as decreased accuracy on comprehension questions and longer reading times at the retrieval region, *the fireman/Joey liked*, when the target NP shared similar properties with the items in the memory list.

[2] The sentences in (5) illustrate conditions comparing matching and mismatching memory loads where the NPs in the memory load list were proper nouns. Conditions involving memory loads with common nouns were excluded to maintain a focus on similarity manipulation when outlining the findings from Gordon, Hendrick, and Levine (2002).

Interference effects can, in principle, manifest in various stages of memory processing, during either encoding or retrieval, or both phases. Although Gordon et al. (2002) demonstrated an effect of proactive interference in their results, their results did not confirm that the effect occurred during retrieval. That is, the encoding features of the NPs in the memory list and sentences were manipulated to be either common or proper nouns. However, the retrieval cues provided by the verb *liked* in (2) were not manipulated uniquely across matching and mismatching memory load conditions to identify its target NP (e.g., *the fireman* or *Joey*), i.e., *liked* does not specifically require its object NP to be classified as either a common or proper noun. As such, it is difficult to attribute the observed effects in Gordon et al. (2002) solely to retrieval-based interference, as they could also stem from encoding interference due to the similarity of the memorized items. To address this gap, Van Dyke and McElree (2006) designed an experiment that tested if proactive interference occurs during encoding or retrieval by using an experimental design that manipulated the retrieval interference while holding encoding interference effects constant across conditions. Using the same memory load paradigm as Gordon et al. (2002), they tested the effect of proactive interference from memory list items that matched or mismatched the semantic plausibility of the verb using sentences as exemplified in (3). To ensure that any observed effects were due to retrieval interference rather than encoding interference, they used the same set of NPs in the memory list across both high and low-interference conditions. Additionally, they manipulated the semantic plausibility of the verbs in the sentences. The verbs were either plausible or implausible in relation to the NPs in the memory list, determining if the verbs could plausibly take the NPs as their objects. For instance, High Interference sentences as in (3a) had a verb (e.g., *fixed*) for which the memory list items (e.g., *table, sink,*

truck) were semantically plausible objects, i.e., they were all 'fixable'. In contrast, the Low Interference sentences as in (3b) had a verb (e.g., *sailed*) for which the memory list items (e.g., *table, sink, truck*) were not suitable objects, i.e., they were not 'sailable'.

(3) Memory load: TABLE-SINK-TRUCK

a. High Interference:

It was *the boat* that the guy who lived by the sea *fixed* in two sunny days.

b. Low Interference:

It was *the boat* that the guy who lived by the sea *sailed* in two sunny days.

(Van Dyke & McElree, 2006, p. 14)

As predicted, they found that the sentences in the high interference condition (3a) were more difficult to process than the sentences in the low interference condition (3b). That is, the participants showed decreased comprehension accuracy and increased reading times at the retrieval region, i.e., the verb *fixed/sailed*, when the memory list items matched the retrieval cues of the verb as in (3a), indicating that they could serve as potential objects. Because the items in the memory load list were the same for both high and low interference conditions, encoding interference was kept equal and constant across conditions. For this reason, Van Dyke and McElree (2006) argued that the observed proactive interference could be attributed to retrieval processes rather than the encoding phase.

Van Dyke and Lewis (2003) examined the effect of retroactive interference from syntactically similar distractors in a self-paced reading and acceptability judgment experiment. They employed sentences like (4), where the verb phrase

(VP), *was paranoid,* was separated from its grammatical subject, *the man,* by the intervening material that introduced either high or low syntactic interference. In the high syntactic interference condition as in (4a), the intervening material included a subject NP, *the townspeople*, as a cue-matching distractor which had similar syntactic properties with the target subject, *the man*. It was predicted that *the townspeople* would cause interference when retrieving *the man* as the subject of the VP *was paranoid*, as it shared the same syntactic function as well as other features (e.g., NP, animate) with the retrieval cues provided by the verb *was paranoid* (e.g., NP, animate). In the low syntactic interference condition as in (4b), there was an intervening object NP, *the dock*.

(4)

a. High Syntactic Interference:

   The frightened boy understood that *the man* who said the townspeople were dangerous *was paranoid* about dying.

b. Low Syntactic Interference:

   The frightened boy understood that *the man* who was swimming near the dock *was paranoid* about dying.

(Van Dyke & Lewis, 2003, p. 295)

Since its syntactic function is that of an object, it was predicted to not cause as much interference as *the townspeople* while retrieving the target subject, *the man,* although similar to *the townspeople,* it shares other features with the subject (e.g., NP). However, given that there are more matching cues with *the townspeople* (e.g., subject, NP, animate) than *the dock* (e.g., NP), it was predicted that resolving the subject-verb dependency between *the man* and *was paranoid* would be more difficult in (4a) than (4b). The results were as predicted. Participants were less accurate in

recognizing the sentences with high syntactic interference as in (4a) as grammatical than the sentences with low syntactic interference as in (4b). The results suggested that although the distance between the VP *was paranoid* and the target subject NP *the man* remained constant across conditions, and processing difficulty increased when the intervening distractor item was syntactically a subject NP instead of an object NP, as evidenced by the reduced accuracy in acceptability judgments. Van Dyke and Lewis (2003) argued that retrieval difficulty during subject-verb dependency processing is caused not merely by the distance between the dependents or by the amount of intervening material but by the similarity-based interference resulting from the syntactic similarity of the intervening material.

Van Dyke (2007) provided additional evidence for retroactive interference caused by syntactically and semantically similar distractors through a series of self-paced reading and eye-tracking experiments using sentences like (5). Their experimental sentences manipulated the semantic (through animacy) and syntactic plausibility (through syntactic position) of the intervening distractor NP, *dangerous neighbor/warehouse*, resulting in four manipulations of interference while retrieving the subject of the verb *was complaining*: the High Syntactic & High Semantic Interference (HiSyn/HiSem) condition featuring a syntactically and semantically plausible distractor such as the subject NP *the dangerous neighbor* as in (5a): the High Syntactic & Low Semantic Interference (HiSyn/LowSem) condition featuring a syntactically plausible but semantically implausible distractor such as the subject NP *the dangerous warehouse* as in (5b), the Low Syntactic & High Semantic (LowSyn/HighSem) Interference condition featuring a syntactically implausible but semantically plausible distractor such as the object NP *the dangerous neighbor* as in (5c), and the Low Syntactic & Low Semantic Interference (LowSyn/LowSem)

condition featuring a syntactically and semantically implausible distractor such as the object NP *the dangerous warehouse* as in (5d).

(5)

a. HiSyn/HiSem:

The worker was surprised that *the resident* who said that the neighbor was dangerous *was complaining* about the investigation.

b. HiSyn/LowSem:

The worker was surprised that *the resident* who said that the warehouse was dangerous *was complaining* about the investigation.

c. LowSyn/HighSem:

The worker was surprised that *the resident* who was living near the dangerous neighbor *was complaining* about the investigation.

d. LowSyn/LowSem:

The worker was surprised that *the resident* who was living near the dangerous warehouse *was complaining* about the investigation.

(Van Dyke, 2007, p. 34)

The sentences containing a distractor with matching syntactic cues (i.e., subject NP) as in the HiSyn conditions in (5a, b) were predicted to be more difficult to process than the sentences containing a distractor which does not match the syntactic cues (i.e., object NP) as in the LowSyn conditions in (5c, d). Similarly, the sentences containing a distractor with matching semantic cues (i.e., animate NP) as in the HiSem conditions in (5a, c) were predicted to be more difficult to process than the sentences containing a distractor that does not match the semantic cues (i.e., inanimate NP) as in the LowSem conditions in (5b, d). The results showed both syntactic and semantic interference effects on both acceptability judgment and online

reading times. That is, the participants were less accurate in their judgments of acceptability and were slower to read the verb *was complaining* in the HiSyn/LowSem conditions as compared to LowSyn/LowSem conditions, and in HiSem/LowSyn conditions as compared to LowSem/LowSyn conditions. Specifically, the effect observed in the HiSem/LowSyn conditions showed that, although the distractor did not share syntactic cue-matching features required for the retrieval of the subject for the verb *was complaining*, the semantic similarity of the distractor and the target subject impaired retrieval, suggesting that semantic cues play a key role in similarity-based interference. The results also showed that participants had the most difficulty processing the sentences in the HighSyn/HighSem condition which features a both syntactically and semantically plausible distractor, suggesting a possible cue-overload as the feature-match between the retrieval cues of the verb and the distractor was the highest in this condition (Van Dyke, 2007).

The findings from previous research on similarity-based interference outlined in this section so far provided evidence of inhibitory interference. Inhibitory interference occurs when features of an intervening item that partially match those of the target item disrupt the retrieval of the target as extensively shown in previous studies (e.g., Gordon et al., 2001; 2002; Van Dyke & Lewis, 2003; Van Dyke & McElree, 2006; Van Dyke, 2007, among others). However, interference effects have also been shown to be facilitatory. Facilitatory interference (also referred to as 'intrusion' or 'attraction') is often observed in the processing of ungrammatical sentences, where the presence of a distractor item with matching features can facilitate the processing of a dependent item when the target item does not fully

match the retrieval cues (Bock & Miller, 1991; Pearlmutter et al., 1999; Wagers et al., 2009; Dillon et al., 2013; Parker et al., 2015; Cunnings, 2017, among others).

Wagers et al. (2009), for instance, examined the effects of agreement attraction from morphologically similar distractors on the comprehension of ungrammatical sentences with subject-verb agreement violations. Agreement attraction occurs when the processing of an ungrammatical sentence is facilitated because a distractor NP partially matches—i.e., "attracts"—the agreement requirements of the verb. In their self-paced reading experiment, participants read ungrammatical sentences like (6), where the subject *the key* does not match the number features of the verb *were rusty*, resulting in ungrammaticality. The experiment manipulated the morphological similarity of the distractor NP (the attractor) intervening between the subject and the verb. In one condition, the attractor was plural, matching the number features of *were rusty* (e.g., (6a)), while in the other, the attractor was singular and did not match the number features of *were rusty* (e.g., (6b)).

(6)

a. Plural Attractor:

   **The key* to the cells unsurprisingly *were rusty* from many years of disuse.

b. Singular Attractor:

   **The key* to the cell unsurprisingly *were rusty* from many years of disuse.

(Wagers et al., 2009, p. 221)

They predicted that if the retrieval of subjects in a subject-verb dependency relies on a cue-based retrieval mechanism, the plural verb (e.g., *were rusty*) would activate

retrieval cues for a plural NP. Consequently, a distractor with a plural number would match these cues and might be incorrectly retrieved as the subject, as in the sentences in (6a). If this is the case, the comprehension of ungrammatical sentences with a plural attractor, such as (6a), would be easier compared to ungrammatical sentences with a singular attractor, as in (6b). The results confirmed the predictions: comprehension was facilitated when the attractor NP shared the same number feature as the verb as in (6a), compared to when the attractor did not agree in number as in (6b), resulting in a temporary illusion of grammaticality. Based on these findings, Wagers et al. (2009) argued that intrusion effects during comprehension are a central prediction of content-addressable memory models, and these facilitatory effects provide evidence that comprehenders retrieve and consider structurally inappropriate elements due to overlapping retrieval cues.

In conclusion, the studies reviewed above demonstrate a significant role for interference in sentence processing, highlighting both proactive and retroactive interference effects. The cue-based memory retrieval model (Lewis & Vasishth, 2005; Van Dyke & McElree, 2011) has provided a theoretical framework for understanding these effects, proposing that retrieval is guided by content-addressable cues, which are equally weighted but vulnerable to decay and interference when distractors overlap with the target (Gordon et al., 2001; 2004; Van Dyke & Lewis, 2003; Lewis et al., 2006; Lewis & Vasishth, 2005; Van Dyke, 2007; Van Dyke & McElree, 2011; Wagers et al., 2009; Dillon et al., 2013, among others). Research supporting this model has identified the role of various cues—syntactic (e.g., Van Dyke & Lewis, 2003), semantic (e.g., animacy; Van Dyke, 2007), and morphological (e.g., Wagers et al., 2009)—in processing long-distance dependencies. However, more recent studies have explored if different linguistic and non-linguistic cues are

weighted differently in resolving (long-distance) dependencies, providing a better understanding of cue interaction during retrieval. Section 2.2. reviews findings from such research.

2.2 Cue-weighting in similarity-based interference

A thorough understanding of how memory processes influence comprehension requires a detailed analysis of the types of cues that drive retrieval and how these cues interact at the retrieval site. However, the weighting of different cue types during retrieval remains a debated topic in the literature. Debates on cue-weighting differences focus on whether all linguistic features can serve as retrieval cues and whether these cues are assigned equal weight (e.g., Sturt, 2003; Dillon et al., 2013; Engelmann et al., 2019; Parker & Phillips, 2017; Yadav et al., 2022), or if their importance varies depending on the structural properties of the dependency being processed (Dillon et al., 2013; Cunnings & Sturt, 2014; Parker & Phillips, 2017).

Van Dyke and McElree (2011) examined if syntactic and semantic cues are given equal weight by investigating the interference caused by a semantically plausible or implausible distractor in both retroactive and proactive contexts in SAT and eye-tracking experiments. Following the experimental designs of Van Dyke (2007) and Van Dyke and Lewis (2003), they used sentences like (7), where *the attorney* must be retrieved as the grammatical subject of the verb *compromised*, despite the presence of a distractor NP in a syntactically inappropriate position, namely, the embedded clause. To investigate how syntactic and semantic cues are weighted, they conducted two separate experiments in which the distractor NP had either semantically matching (animate, e.g., *the witness*) or mismatching (inanimate, e.g., *the motion*) cues for retrieval. In Experiment 1, the distractor (a subject) was

syntactically matching the retrieval cues of the target verb, while in Experiment 2, the distractor (an object) was syntactically mismatching the retrieval cues of the target verb. They also examined the effects of interference in both retroactive and proactive contexts. In retroactive interference conditions, the distractor NP (e.g., *the motion/the witness*) was presented after the target subject (e.g., *the attorney*), whereas in proactive interference conditions, it was presented before the target subject.

(7)

a. Subject Distractor, Retroactive Interference:

   The attorney who the judge realized had declared that the motion/the witness was inappropriate *compromised*.

b. Subject Distractor, Proactive Interference:

   The judge who had declared that the witness/the motion was inappropriate realized that *the attorney* for the case *compromised*.

c. Object Distractor, Retroactive Interference:

   The attorney who the judge realized had rejected the witness/the motion in the case *compromised*.

d. Object Distractor, Proactive Interference:

   The judge who had rejected the witness/the motion realized that *the attorney* in the case *compromised*.

(Van Dyke & McElree, 2011, pp. 6–7)

They predicted that if a direct-access parallel retrieval mechanism is used to resolve long-distance subject-verb dependencies, processing speed should remain constant across retroactive and proactive conditions. However, the accuracy should be lower in retroactive conditions compared to proactive conditions because in the proactive

conditions, the subject NP is more recently processed, i.e., has a higher memory activation level than the distractor NP which is less recent than the target NP. Conversely, if a search mechanism is employed, as predicted by search-based models (e.g., McElree & Dosher, 1989), processing speed should differ between the two conditions.

The results showed that semantically cue-matching distractors caused retrieval interference only in syntactically cue-matching contexts. Specifically, interference occurred when the distractor was a subject, as in (7a, b), but not when it was an object, as in (7c, d). Participants demonstrated decreased accuracy in the SAT experiment and increased reading times at the target verb in eye-tracking measures in conditions where the distractor was semantically similar and syntactically appropriate (subject) as in (7a, b). However, no semantic interference effect was observed when the distractor was in a syntactically inappropriate position (object), as in (7c, d). Based on these findings, the authors argued that syntactic context influences the weighting of semantic cues, leading to greater emphasis on semantic cues in syntactically cue-matching contexts. The results also indicated that interference effects for semantically and syntactically similar distractors were more pronounced in retroactive contexts compared to proactive contexts. In retroactive interference conditions, participants exhibited decreased accuracy in SAT experiments, along with increased reading times and more regressive eye movements. However, processing speed, as measured by SAT results, did not differ between retroactive and proactive interference conditions. This finding aligns with the predictions of a direct-access parallel retrieval account.

Dillon et al. (2013) investigated the role of morphological cues in resolving subject-verb and reflexive-antecedent dependencies. While both dependencies rely

on similar retrieval cues in cue-based retrieval, they are governed by different linguistic constraints. Reflexives are regulated by certain binding constraints that require their antecedents to be within the same local syntactic domain (Reinhart & Reuland, 1993).[3] For example, in the sentence *John saw himself*, the reflexive *himself* must refer to *John* because they exist within the same local domain, namely the clause containing both elements. However, distractors outside this local domain, such as an NP in a different clause (e.g., *Harry* in *Harry said that John saw himself*), are syntactically inaccessible and cannot serve as antecedents for the reflexive. They conducted eye-tracking experiments using ungrammatical sentences like (8). These sentences were designed to induce intrusion effects from structurally inaccessible distractors in subject-verb (8a) and reflexive (8b) dependencies. The distractor NPs in both types of dependencies either matched or mismatched the number features (plural vs. singular) of the retrieval cues provided at the probe, e.g., the verb (e.g., *were dishonest* as in (8a)) for subject-verb dependencies and the reflexive pronoun (e.g., *themselves* as in (8b)) for the reflexive-antecedent dependencies. Dillon et al. (2013) predicted that if retrieval cues were directly mapped to overt morphological features without any effect of syntactic constraints, subject-verb agreement and reflexive-antecedent dependencies should show similar intrusion effects, leading to grammaticality illusions when the distractor NP, *the middle managers,* was in plural form, matching the number feature of the retrieval cues at the verb, *were dishonest* as in (8a) or at the reflexive pronoun, *themselves* as in (8b). However, if the use of morphological features was modulated by the syntactic constraints of dependencies,

[3] A syntactic domain refers to the structural area where specific syntactic rules, such as binding constraints, apply.

the two types of dependencies would differ in how they were influenced by interference from a morphologically cue-matching distractor.

(8)

a. Subject-verb:

**The new executive* who oversaw the middle manager(s) apparently *were dishonest* about the company's profits.

b. Reflexive:

**The new executive* who oversaw the middle manager(s) apparently doubted *themselves* on most major decisions.

(Dillon et al., 2013, p. 89)

Their results showed intrusion effects from a morphologically cue-matching distractor only in subject-verb number agreement dependencies, not in anaphoric dependencies. Specifically, processing was facilitated in ungrammatical subject-verb agreement sentences with a plural distractor, but this effect was absent in sentences involving reflexive binding with a plural distractor. These findings suggest that the syntactic constraints governing reflexive/anaphoric binding make reflexive-anaphora resolution more resistant to similarity-based interference from syntactically inaccessible distractors, compared to subject-verb agreement dependencies.

Building on the earlier findings which were based on studies with limited sample sizes (e.g., Sturt, 2003; Xiang et al., 2009; Dillon et al., 2013), Jäger et al. (2020) conducted a larger-scale experiment (i.e., with a larger sample size) following the same experimental design with Dillon et al. (2013). The results of Jäger et al. (2020) study challenged the earlier conclusions by Dillon et al. (2013) in that they showed both subject-verb agreement and reflexive/anaphora resolution were equally susceptible to facilitatory interference from both structural and morphological cues,

suggesting that both cues are weighted similarly in processing long-distance dependencies in sentence processing.

Most of the studies discussed so far have focused on English. A recent study by Mertzen et al. (2021) investigated interference effects in subject-verb dependencies in German and English using sentences like (9a-b) in an eye-tracking experiment. They manipulated the syntactic position (subject vs. object) and animacy of the distractor NPs (e.g., *scandal*/*mafia boss*).

(9)

a. Object distractor:

English: It turned out that *the journalist* whose colleague had reported on the gruesome scandal/mafia boss in fact *lied* to obtain information.

German: Es stellte sich heraus, dass *der Journalist*, dessen Kollege von dem grauenhaften Skandal/Mafiaboss berichtet hatte, tatsächlich *log* um Informationen zu erhalten.

b. Subject distractor:

English: It turned out that the *journalist* whose colleague had reported that the scandal/mafia boss was gruesome in fact *lied* to obtain information.

German: Es stellte sich heraus, dass *der Journalist*, dessen Kollege berichtet hatte, dass der Skandal/Mafiaboss grauenhaft war, tatsächlich *log* um Informationen zu erhalten.

(Mertzen et al., 2021, pp. 8–10)

They argued that if both semantic and syntactic cues guide retrieval at the retrieval site (the verb in subject-verb dependencies), then both the effects of semantically and syntactically similar distractors should be observable as increased reading times at

the critical verb. A key difference between English and German is that German uses explicit morphological case marking, with subjects overtly marked by the nominative case, as seen in *der Journalist* ("the-NOM journalist") in (9a, b). If overt case marking influences interference effects, they predicted that syntactic and semantic interference would differ between English and German.

The results from the English sentences showed that reading times at the critical verb were longer when the distractor had syntactic and semantic similarity (animate compared to inanimate and when it was a subject rather than an object), indicating both syntactic and semantic interference effects at the critical verb. In contrast, the results from the German sentences revealed only syntactic interference at the critical verb, with semantic interference emerging only in the post-critical regions. Specifically, reading times at the critical verb were longer when the distractor was a subject rather than an object, but there was no difference between animate and inanimate distractors. Mertzen et al. (2021) argued that, in German, greater weight is placed on morphosyntactic cues (such as case marking) when retrieving a subject for a verb, whereas English relies equally on morphosyntactic and semantic cues. The authors proposed that this stronger reliance on morphosyntactic cues in German stems from its overt case marking, which provides a reliable way to identify grammatical roles in a sentence. While prior studies have consistently reported interference effects from morphological, semantic, and syntactic cues in English, Mertzen et al.'s (2021) findings suggest that cue-weighting in dependency processing may vary across languages.

In conclusion, the body of research examining memory processes and retrieval cue-weighting in sentence processing highlights the complex interplay between different linguistic cues—e.g., syntactic, semantic, and morphological.

Studies have revealed that these cues are not weighted equally during retrieval, with syntactic cues often taking precedence over semantic ones, particularly in certain types of dependencies. For example, Van Dyke and McElree (2011) demonstrated that syntactic cues can outweigh semantically matching distractors, while Dillon et al. (2013) showed that syntactic constraints are more influential in resolving reflexive dependencies than in subject-verb agreement. However, recent studies like Jäger et al. (2020) suggest that facilitatory interference can also affect anaphoric dependencies, challenging earlier assumptions about intrusion immunity of reflexives. Moreover, cross-linguistic differences, such as those observed between English and German (Mertzen et al., 2021), showed that cue-weighting may also depend on language-specific properties, suggesting that linguistic typology and morphological richness play a significant role in how different types of cues are weighted during sentence processing.

Chapter 3 examines long-distance sluicing dependencies with a general exploration of sluicing as a syntactic phenomenon and an investigation of how sluicing operates in Turkish, including a discussion of language-specific features and differences. It also reviews prior research on sluicing processing, with an examination of the role of various retrieval cues and the antecedents' distance in it.

CHAPTER 3

SLUICING AND ITS PROCESSING

Sluicing, also called *clausal ellipsis*, is a type of ellipsis where an interrogative clause such as *Who is at the door?* is reduced to its *wh*-phrase such as *who* __ as in (1) below. The *wh*-phrase that remains after the deletion of the rest of the clause is called *the remnant,* and the site that is elided is called *the ellipsis site*, or simply *the e-site*. The TP from which we infer the sluiced content is called *the antecedent*, and the indefinite NP inside this antecedent, which is co-indexed with the remnant, is called *the correlate*.

(1)

a. [[Someone$_i$]$_{\text{CORRELATE}}$ is at the door]$_{\text{ANTECEDENT}}$ but I don't know who$_{i_\text{REMNANT}}$ [~~is at the door~~]$_{\textit{E}\text{-SITE}}$.

The linguistic phenomenon of sluicing presents a compelling puzzle for researchers, as it raises intriguing questions about the nature of meaning and structure in language. In sluicing constructions, the only overt elements remaining from the elided interrogative clauses are the *wh*-remnants, yet the elided interrogative clauses are still interpreted as complete constituent questions. This suggests that there must be an underlying mechanism at play that allows language users to infer the elided material.

Ross (1969) was the first to identify and linguistically analyze sluicing structures, proposing that the sluicing in the sentence in (2a) results from a transformational process applied to the sentence in (2b).

(2)

a. Someone is at the door but I don't know who.

b. Someone is at the door but I don't know who is at the door.

According to Ross, this transformation involves two steps. First, the *wh*-phrase *who* from the interrogative clause *who is at the door* moves to the specifier (Spec) position of the complementizer phrase (CP). Then, the remaining node of the complementizer clause, i.e., the tense phrase (TP) from which the *wh*-phrase originated, is deleted, leaving only the *wh*-phrase, *who,* from the full interrogative clause *who is at the door*.

Theoretical analysis of sluicing primarily aims to address two key questions about the interpretation of the elided material: whether the *e*-site contains an underlying implicit syntactic material and how the conditions that permit elision should be defined and characterized (e.g., Merchant, 2001; Chung et al., 1995). Two main theoretical accounts address these questions: non-structural accounts and structural accounts. Non-structural accounts argue that sluicing does not involve an underlying syntactic structure at the *e*-site. Instead, the *wh*-phrase is dominated by a single syntactic node, with the omitted content reconstructed from the context (Ginzburg & Sag, 2000; Culicover & Jackendoff, 2019). Structural accounts argue for the presence of an underlying implicit syntactic structure at the *e*-site which is not pronounced (Ross, 1969; Chung et al., 1995; Lasnik, 2001; Merchant, 2001).

Structural accounts of sluicing are grounded in the observed semantic and syntactic correspondences between the elided content and its antecedent. Merchant (2001) proposes that sluicing involves the deletion of a TP under the condition that the antecedent and the sluice are semantically identical. This requirement is formalized as the *e-GIVEN*ness condition, which states that the antecedent in a

sluicing construction must be presupposed or "given" in the discourse. In essence, the elided material (the sluice) must refer to information that is already established in the conversational or contextual background. This ensures that sluicing functions to clarify or inquire about prior information rather than introducing entirely new content. To meet the *e-GIVEN*ness condition, the omitted material must satisfy two specific requirements. First, it must fulfill mutual entailment, meaning the antecedent and the elided material must semantically entail each other. Second, it must adhere to the focus condition, which allows variation only in focus-sensitive elements, such as pitch accents, that do not alter the semantic identity of the antecedent and the elided structure. Together, these requirements ensure that the sluice maintains a close semantic correspondence with its antecedent, preserving its interpretative clarity.

In addition to semantic constraints, structural accounts emphasize the importance of syntactic identity, supported by connectivity effects. Connectivity effects reflect the structural parallelism, such as matching case, tense, or prepositions, between the antecedent and the sluice, demonstrating that the two elements are syntactically linked. These observations further reinforce the idea that sluicing involves the deletion of a fully formed syntactic structure rather than being an independent fragment consisting solely of a *wh*-phrase. For example, Ross (1969) describes the case-connectivity effect, which requires that the *wh*-remnant and its correlate in the antecedent share the same case, as illustrated in examples in (3a-b). In (3a), only the dative form *wem* ("whom") is acceptable since *schmeicheln* ("to flatter") requires a dative object. In contrast, in (3b), only the accusative form *wen* ("whom") is acceptable because *loben* ("to praise") takes an accusative object.

(3)

a. Er will jemandem *schmeicheln*, aber sie wissen nicht,
he wants someone.DAT flatter but they know not
*wer / *wen / wem.
*who.NOM *who.ACC who.DAT
'He wants to flatter someone, but they don't know who.'

b. Er will jemandem *loben*, aber sie wissen nicht,
he wants someone.DAT flatter but they know not
*wer / wen / *wem.
*who.NOM who.ACC *who.DAT
'He wants to flatter someone, but they don't know who.'

(Ross, 1969, pp. 253–254)

There are two approaches to the structural analyses of sluicing: movement-based and non-movement-based. The movement-based approaches (Ross, 1969; Merchant, 2001; Lasnik, 2001, among others) propose that in sluicing constructions, the *wh*-phrase undergoes movement to the specifier position of CP within the elided interrogative clause before the TP is deleted. The movement-based approach is also called the PF-deletion approach because, in the movement-based approach, the deletion of the TP is understood as PF (phonological form) deletion since the *e*-site implicitly retains its syntactic structure.

The non-movement approach (Chung et al., 1995; Lasnik, 2001) posits that the *wh*-phrase remnant in sluicing constructions is not moved to Spec, CP, but is instead base-generated there. In this view, the *e*-site contains a null category, which is later replaced by copying the content of the antecedent from its logical form (LF) after the sentence is spelled out. Thus, these approaches are often referred to as the

LF-copying approach. The primary justification for adopting a non-movement approach to sluicing stems from the observation that sluicing constructions do not seem to adhere to island constraints. Island constraints are grammatical rules that limit where elements of a sentence, such as *wh*-phrases, can be moved during transformations like question formation or relativization. These constraints ensure that certain structures, known as "islands", are off-limits for movement. For instance, in complex sentences involving embedded clauses, relative clauses, or coordinated structures, moving a *wh*-phrase out of these islands typically results in ungrammaticality. The example in (4a) shows a grammatical sentence with a sluiced clause. Its remnant, *which,* is co-indexed with a correlate, *a Balkan language*, located within a relative clause island *who speaks a Balkan language* in the antecedent clause *They want to hire someone who speaks a Balkan language*. On the other hand, the sentence in (4b), I *don't remember which Balkan language they want to hire someone who speaks* is ungrammatical because the *wh*-word *who* attempts to move out of a relative clause violates an island constraint. This apparent disregard for island constraints under sluicing motivates the non-movement-based analyses.

(4)

a. They want to hire someone who speaks [a Balkan language]$_i$, but I don't remember which$_i$ ~~[(Balkan language)$_i$ they want to hire someone [who speaks ____]~~.

b. *Which (Balkan language) they want to hire someone [who speaks ___].

(Merchant, 1999, p. 6)

In conclusion, the study of sluicing has led to significant theoretical debates and advancements in understanding its syntactic and semantic properties. A key

challenge in this area is reconciling two seemingly opposing observations: the connectivity effects, which suggest that sluicing involves movement structures, and the absence of island effects, which point to non-movement mechanisms. Researchers have struggled to explain how sluicing can show movement-like dependencies between the remnant and its antecedent while simultaneously bypassing island constraints.

This section aims to give a general picture of the main theoretical principles that are proposed to define sluicing constructions and their observed properties. Thus, a more detailed analysis of sluicing constructions will not be pursued here (see Merchant, 2006 for a review). Section 3.1. focuses on the analyses of sluicing in Turkish, presenting previous work on how these theoretical principles apply to this language and what this reveals about sluicing across different linguistic contexts.

3.1 Sluicing in Turkish

Turkish is a *wh*-in-situ language with SOV order and presents challenges to the traditional analyses of sluicing which are predominantly based on evidence from English—a language with SVO order and *wh*-movement. It is often argued that *wh*-in-situ languages generally lack the 'genuine' sluicing structures found in English. Instead, sluicing in these languages is commonly referred to as *sluicing-like* structures (SLC) in the literature. Such accounts suggest that what appear to be sluicing structures in these languages are, in fact, clefts, or at least *cleft-like* in their underlying structure (e.g., Kizu, 1998; Kuwabara, 1997; Hiraiwa & Ishihara, 2012, among others).

Although various proposals have been made for the syntactic analysis of SLCs in Turkish (İnce, 2012; Şener, 2012; Palaz, 2019; Kiper, 2020; Zidani-Eroğlu,

2019), this section will focus on the main observations that show Turkish SLCs present unique characteristics that set them apart from both clefts and canonical English sluicing. İnce (2006; 2009; 2012) is among the first to analyze Turkish SLCs and challenge the claim that sluicing in *wh*-in-situ languages like Turkish has cleft-like properties. A cleft sentence is a construction used to emphasize a specific part of a sentence by splitting it into two clauses. For example, in English, *John ate the cake* can be rephrased as *It is John who ate the cake* to focus on *John*. Similarly, in Turkish, *Pastayı Ali yedi* "Ali ate the cake" can be expressed as *Pastayı yiyen Ali'dir* "It is Ali who ate the cake", emphasizing *Ali*. The element being emphasized in a cleft construction is called the pivot, such as *John* in the English example and *Ali* in the Turkish example.

İnce (2006; 2009) argued that sluicing structures in Turkish differ fundamentally from cleft constructions in several significant ways. First, in cleft constructions, the pivot is restricted to the nominative case, whereas in sluicing, the *wh*-remnant can take various cases, determined by the case of its indefinite correlate (İnce, 2006; 2009). For example, as illustrated in (5), the correlate and the remnant in Turkish sluicing constructions require matching case features exhibiting case connectivity effects that are observed by Ross (1969) and Merchant (2001) for English sluicing structures.

(5)

a. Ahmet-Ø biri-ne kitap ver-miş, ama kim-e/*-Ø
   Ahmet-NOM one-DAT book gave-3SG but who-DAT
   bil-mi-yorum.
   know-NEG-PRES-1SG
   'Ahmet gave book to someone, but I do not know to who.'

b. Ahmet-Ø biri-nden borç al-mış, ama kim-den/*-Ø
Ahmet-NOM one-ABL debt took-3SG but who-ABL
bil-mi-yor-um.
know-NEG-PRES-1SG
'Ahmet borrowed book from someone, but I don't know who from.'

c. Ahmet-Ø biri-ni döv-müş, ama kim-i/*-Ø
Ahmet-NOM one-ACC beat-3SG but who-ACC
bil-mi-yor-um.
know-NEG-PRES-1SG
'Ahmet beat someone, but I don't know who.'

(İnce, 2012, pp. 8–9)

Second, *wh*-adjuncts such as *ne zaman* ("when") or *neden* ("why") are allowed in sluicing but excluded from cleft constructions, as illustrated in sentences like (6). In (6a), clefting the *wh*-adjunct *ne zaman* is not permitted, resulting in ungrammaticality. In contrast, sluicing of *wh*-adjuncts, as seen in (6b) and (6c) with *where* and *when* is permissible and does not render the sentence ungrammatical.

(6)

a. *Ali-nin git-tiğ-i dün / ne zaman
Ali-GEN go-COMP-POSS.3SG yesterday / what time
'It's yesterday that Ali went/When is that Ali went?'

b. Ali-Ø Ankara-ya git-ti-Ø, ama ne zaman
Ali-NOM Ankara-DAT go-PST-3SG but what time
bil-mi-yor-um.
know-NEG-PRES-1SG
'Ali went to Ankara, but I don't know when.'

c. Ali-Ø bir yer-e git-ti-Ø, ama nere-ye
Ali-NOM a place-DAT go-PST-3SG but where-DAT
bil-mi-yor-um.
know-NEG-PRES-1SG
'Ali went somewhere, but I don't know where.'

(İnce, 2012, pp. 10–11)

Third, Turkish permits multiple sluicing, as in (7a) but it does not allow multiple cleftings as in (7b). These distinctions demonstrate that Turkish sluicing cannot be analyzed as a variant of cleft constructions.

(7)

a. Ahmet birinden bir şey almış; ama
Ahmet-NOM someone-ABL something borrowed-3SG but
kim-den ne bil-mi-yorum.
who-ABL what know-NEG-PRES.1SG
'Ahmet borrowed something from someone; but I do not know what from whom.'

b. *Ahmet-in t_i t_j al-dığı Hasan(dan)$_i$ kitap$_j$.
Ahmet-GEN borrow-REL Hasan-(ABL) book-NOM.
'It's a book from Hasan that Ahmet borrowed.'

(İnce, 2012, p. 12)

Palaz (2019) introduces a more nuanced analysis of the case connectivity effects observed in Turkish and distinguishes between two types of SLCs in Turkish: pseudo-sluicing and genuine sluicing based on the case alignment between the remnant and its correlate. Palaz (2019) observes two cases of SLCs in Turkish, one that permits a case mismatch between the remnant and its correlates, and the other

that requires a case match between them. Palaz (2019) argues that when the *wh*-remnant in a sluicing construction shares the same case marking as its correlate, the structure represents genuine sluicing. For example, in (8a), the alignment of the accusative case between the *wh*-remnant *kimden* "who-ABL" and its correlate *birinden* "someone-ABL" signals genuine sluicing. In contrast, when there is no case alignment as in (8b), the structure indicates pseudo-sluicing, where a pro-form is involved. According to Palaz (2019), case alignment (and lack thereof) is the main distinctive criterion distinguishing pseudo-sluicing from sluicing.

(8)

a. Sluicing:

Cem birinden kaçıyordu ama kim-den
Cem someone-ABL escape-PRES.PST.3SG but who-DAT
bilmiyorum.
know-NEG-PRES.1SG
'Cem was escaping from someone, but I don't know who.'

b. Pseudo-sluicing:

Cem birinden$_i$ kaçıyordu ama [pro$_i$ kim]
Cem someone-ABL escape-PRES.PST.3SG but [who]
bilmiyorum.
know-NEG-PRES.1SG
'Cem was escaping from someone, but I don't know who (that was).'

(Palaz, 2019, p. 70)

The observations of connectivity between the remnant and its correlate in sluicing so far have primarily focused on the syntactic properties they share. However, it should also be noted that semantic constraints contribute to shaping the

relationship between the sluiced material and its antecedent. For instance, as illustrated in the sentences in (9), matching animacy features between the correlate and the remnant are required in addition to shared case features in Turkish sluicing constructions. This is evident in examples such as (9a), *Abim birine baktı ama kime bilmiyoruz* ("My brother looked for someone, but we don't know for whom"), where both the correlate *birine* ("someone-DAT") and the remnant *kime* ("who-DAT") share both case and animacy features. In contrast, mismatched animacy, as in *Abim bir şeye baktı ama kime bilmiyoruz* ("My brother looked for something, but we don't know to whom"), results in ungrammaticality due to a semantic mismatch.

(9)

a. [Abim birine$_{\text{CORRELATE}}$ baktı]$_{\text{ANTECEDENT}}$ ama
brother-POSS.1SG someone-DAT look-PST.3SG but
[kime / *neye]$_{\text{REMNANT}}$ bilmiyoruz.
who-DAT / *what-DAT know-NEG-PROG.1PL
'My brother looked for someone, but we don't know for whom/*what.'

b. [Abim bir şeye$_{\text{CORRELATE}}$ baktı]$_{\text{ANTECEDENT}}$ ama
brother-POSS.1SG something-DAT look-PST.3SG but
[*kime / neye]$_{\text{REMNANT}}$ bilmiyoruz.
*who-DAT / what-DAT know-NEG-PROG.1PL
'My brother looked for something, but we don't know for what /*to whom.'

These examples demonstrate that in Turkish, the relationship between the correlate and the remnant in sluicing constructions is governed not only by syntactic connectivity, such as case alignment but also by semantic compatibility, including

animacy agreement. This observation expands on previously noted parallelism effects, emphasizing the interplay of both syntactic and semantic factors in Turkish sluicing.

Further evidence supporting the existence of sluicing in Turkish arises from the observation that sluicing remnants can bind correlates even when these correlates are located within syntactic islands as in English. This feature is demonstrated in (10), where the remnant successfully binds an element within an embedded complement clause.

(10)

Ahmet [biri-nden borç
Ahmet-NOM someone-ABL debt
al-dı-ğ-ı]-nı söyle-miş-ti.
take-PST-COMP-POSS.3SG-ACC say-EVID.PST.3SG
Ama kim-den-di hatırla-mı-yor-um.
but who-ABL-PST remember-NEG-PROG.1SG
'Ahmet had said that he borrowed money from someone. But I don't remember who from.'

(İnce, 2006, p. 121)

In summary, Turkish SLCs present unique characteristics that set them apart from both clefts and canonical English sluicing, challenging traditional assumptions about *wh*-in-situ languages. Turkish is argued to diverge from *wh*-in-situ languages such as Japanese in that its *pseudo-sluicing* structures do not display cleft-like characteristics (İnce, 2006; 2009; 2012; Şener, 2012; Palaz, 2019). The syntactic analyses of Turkish sluicing structures, nevertheless, still reflect structural deviance from canonical English sluicing and this divergence has led to multiple theoretical

accounts. While the underlying structure of sluicing in a *wh*-in-situ language like Turkish remains a topic of ongoing debate (İnce, 2012; Şener, 2012; Palaz, 2019; Kiper, 2020; Zidani-Eroğlu, 2019), the linguistic properties discussed in this section provide observations on the evidence for the presence of sluicing in Turkish. A thorough examination of its syntactic properties, however, would be beyond the scope of this thesis and thus will not be pursued here.

The following section presents previous work on how sluicing is processed. It also examines how the predictions of cue-based retrieval mechanisms operate in sluicing comprehension, with a focus on the roles of syntactic, semantic, and morphological cues, as well as the effect of distance in processing sluicing dependencies.

3.2 Processing sluicing

Sluicing is a type of long-distance dependency that poses unique challenges for sentence comprehension. The processing of sentences involving sluicing, such as (11), likely involves at least the following retrieval stages: identifying the ellipsis site, reconstructing the elided TP following the remnant, and linking the remnant to its corresponding correlate. That is, in (11), comprehenders must retrieve *the target*, *someone sang* (the antecedent), to interpret the elided interrogative clause at the *probe*, i.e., the retrieval site, *who* ____, correctly inferring that the remnant *who* must be co-indexed with *someone* (the correlate) in the antecedent. This process is potentially complicated by the intervening material (*the student danced*, the distractor), which shares similarities with the antecedent and the correlate (e.g., another TP with a transitive verb, including an object NP), increasing the likelihood of interference.

(11)

[Someone$_{i}$_CORRELATE sang]_ANTECEDENT (TARGET) and [the student_DISTRACTOR_NP danced]_DISTRACTOR_TP but I don't know [who$_{i}$ ___]_REMNANT(RETRIEVAL_SITE).

In cue-based memory retrieval, retrieval is guided by various cues associated with the target item, and the retrieval process is constrained by two key memory limitations: activation-based decay, which causes memory representations to become less accessible over time, and similarity-based interference, where competition among items with overlapping features makes accurate retrieval of the target challenging (e.g., Lewis & Vasishth, 2005). In sluicing, the retrieval process is conceivably guided by the syntactic, morphological, and semantic features encoded in the remnant which would *probe* the retrieval of features of the *target* to resolve the dependency. If a cue-based retrieval mechanism is employed during the retrieval of the antecedent and the correlate of a sluicing dependency, then a processing cost might be predicted in cases where there is a high degree of cue overlap among potential correlates and antecedents in memory due to similarity-based interference or when the potential correlates and antecedents are distant from the ellipsis site due to activation-based decay.

Previous research on the processing of sluicing and elliptical structures in general has primarily focused on two key effects: *locality* and *parallelism*. The locality effect is observed in sluicing processing as a notable preference among language users to associate the remnant of an ellipsis with the closest NP in the antecedent clause (Frazier & Clifton, 1998; Carlson, 2013; Carlson et al., 2009; Harris, 2015; Harris & Carlson, 2016, among others). The parallelism effect is observed in sluicing processing as a processing advantage arising when there is

parallelism (e.g., structural, prosodic, semantic, and morphological) between the remnants and correlates (e.g., Dickey & Bunger, 2011; Nykiel, 2013; Nykiel et al., 2023; Rasekhi & Harris, 2021, among others).

In one of the earliest investigations of sluicing processing, Frazier and Clifton (1998) investigated the locality effect in sluicing sentences with two potential antecedent sites in an eye-tracking experiment using sentences like those in (12a-b). In sentence (12a), there are two indefinite NPs, *somebody* and *someone*. One NP is in the subject position of the matrix clause, and the other is in the object position of the embedded clause. This structure makes the sentence ambiguous because both indefinite NPs could potentially serve as correlates for the remnant of the sluiced clause *who*. In contrast, sentence (12b) is unambiguous as it contains only one indefinite NP, *somebody*, in the subject position of the matrix clause.

(12)

a. *Somebody* claimed that the president fired *someone*, but nobody knows *who*.

b. *Somebody* claimed that the president fired Fred, but nobody knows *who*.

(Frazier & Clifton, 1998, pp. 510–511)

Frazier and Clifton (1998) hypothesized that the lower NP in the object position would be preferred as the correlate for the remnant in sluicing because it is in the default focus position in the sentence. According to their hypothesis, the ambiguous sentence in (12a) should be processed faster than the unambiguous sentence in (12b) because (12a) has an indefinite NP in the lower position, which can serve as a potential correlate. Furthermore, the definite NP in the lower position, *Fred*, in (12b) would block the participants from easily binding the remnant, *who,*

with a correlate in a preferred position. As predicted, the results of the eye-tracking experiment showed that the participants required more time to read the remnant and its spill-over region in sentences with a single correlate in the subject position as in (12b) than in sentences containing two potential correlates residing in subject and object positions as in (12a).

In a follow-up offline questionnaire, the participants' final interpretations of the preferred correlates for ambiguous sentences like (13) were evaluated to confirm that the participants preferred the NP in the lower position as the correlate in cases of ambiguity.

(13)

Some teacher says that the students will flunk *an exam*—guess *which one*.

Which one = ___ some teacher ___ some exam.

(Frazier & Clifton, 1998, p. 514)

Aligning with the findings from the online measures, the results demonstrated a strong preference for selecting the lower NP in the object position of the embedded clause (*some exam*) over the higher NP in the subject position of the matrix clause (*some teacher*) (77.0%; *SE* = .02). Based on these findings, they argued that language users prefer a lower NP in an object position as the correlate of the remnant of a sluiced clause because it typically carries the sentential focus, making it more salient and accessible for retrieval.

Nykiel (2013) examined the role of parallelism between a remnant and its correlate in sluicing processing in an offline naturalness judgment study. To investigate if there was a preference for parallelism between correlates and remnants, they collected naturalness judgments on various sentence continuations from

participants for sluiced sentences like (14a, b). The experimental sentences manipulated the complexity of the NPs which could serve as potential correlates and the complexity of the remnants in the A- and B-continuations. For example, an indefinite NP such as *customer* in (14a) is assumed to be more complex than an indefinite pronoun, like *someone* in (14b). And a remnant in the form of a *which*-NP phrase like *which customer* in A-continuations in (14a, b), is assumed to be more complex than a remnant in the form of a bare *wh*-phrase like *which* in B-continuations in (14a, b).

(14)

a. Indefinite NP correlate:

   Nick got attacked by *a customer*, but…

   A: Partial overlap continuation: …he couldn't tell *who*.

   B: Maximal overlap continuation: …he couldn't tell *which customer*.

b. Indefinite pronoun correlate:

   Nick got attacked by *someone*, but…

   A: Partial overlap continuation: …he couldn't tell *which customer*.

   B: Maximal overlap continuation: …he couldn't tell *who*.

(Nykiel, 2013, p. 11)

Nykiel (2013) predicted that continuations that ensure the maximal overlap between the correlate and the remnant as in B-continuations for (14a) and (14b) (i.e., when they are both more complex, as in *a customer* and *which customer* in (14a), or both less complex as in *someone* and *who* in (14b)) would be rated as more natural than those with partial overlap as in A-continuations in (14a) and (14b) (i.e., when one the correlate is more complex but the remnant is less complex as in *a customer* and *who* in (14a), and as in *someone* and *which customer* in (14b)). The results revealed a

strong preference for parallelism in complexity. That is, participants were more likely to prefer the continuations with a more complex remnant, e.g., *which customer*, when the sentence fragment contained a more complex correlate, e.g., *a customer*; and they were more likely to prefer the continuations with a less complex remnant, e.g., *who*, when the sentence fragment contained a less complex correlate, e.g., *someone*. Based on these results, Nykiel (2013) suggested that the shared features between remnants and correlates (i.e., having similar complexity) likely serve as cues for establishing dependencies between them.

Harris (2015) examined the effects of the locality and the parallelism in an eye-tracking experiment. Using sentences like (15), they manipulated the structural position of the correlates (subject correlate vs. object correlate) and the distractor NPs as well as the level of specification in the remnant (cue-rich probe vs. cue-poor probe). In the cue-rich probe condition, remnants were fully specified by a nominal, such as *which wines*, while in the cue-poor probe condition, remnants were only partially specified by a pronoun, such as *which ones*. In the conditions where the target correlate, *some wines*, was in the subject position (distant correlate as in (15c, d)), there was a distractor NP in the object position, *the tourists*. While in the conditions where the target correlate was in the object position (local correlate as in (15a, b)), the distractor resided in the subject position. In addition, they manipulated the number feature of the distractor NP *the tourist(s)* (plural vs. singular) to match (plural) or mismatch (singular) the number of the target correlate, *some wines* (plural).

They had three key predictions. First, if there is a structurally governed locality effect, they predicted that the structurally most local correlate, such as the NP in the object position as in the sentences (15a, b), would be preferred during

retrieval, and the sentences with a local correlate would be easier to process, reflecting a locality bias. Second, if a cue-rich probe increased the retrieval success of the correlate by providing a higher parallelism and cue overlap between the correlate and the remnant, the retrieval was predicted to be facilitated when the remnants were cue-rich (nominal like *which wines*) as in the sentences (15b, d) as compared to when they were cue-poor (pronominal like *which ones*) as in sentences (15a, c). Third, if the retrieval of the correlate was structurally motivated (i.e., if there was a bias for an object correlate instead of a subject correlate), a distractor NP occupying the structurally preferred, local object position as in the sentences (15c, d) would create higher interference than a distractor occupying a subject position as in the sentences (15a, b).

(15)

a. Cue-poor Probe, Local Correlate:

   The tourist(s) sampled *some wines*, but I've forgotten *which ones*.

b. Cue-rich Probe, Local Correlate:

   The tourist(s) sampled *some wines*, but I've forgotten *which wines*.

c. Cue-poor Probe, Distant Correlate:

   Some tourists sampled the wine(s), but I've forgotten *which ones*.

d. Cue-rich Probe, Distant Correlate:

   Some tourists sampled the wine(s), but I've forgotten *which tourists*.

(Harris, 2015, p. 7)

The results aligned with all three key predictions. There was an effect of locality bias reflected as increased difficulty in the distant conditions as compared to local conditions. That is, the remnant was read longer in the sentences with subject correlates as compared to sentences with object correlates. There was also an effect

of cue-richness of the remnant, reflecting a processing advantage for cue-rich probes as compared to cue-poor probes. Moreover, the effect of interference from plural distractors was higher when the distractor occupied the object position, and the effect of interference was particularly pronounced when the remnant's retrieval cues were less specific (cue-poor probe). That is, they observed increased reading times at the remnant when the plural distractor appeared in the object position, but only in conditions with cue-poor conditions (i.e., sentences with pronominal remnants like *which ones*). Harris (2015) described the observed preference for local correlates as the locality bias, defined as "Associate the remnant of clausal ellipsis with a correlate occupying the structurally most local position." (p. 4). In this perspective, the most deeply embedded argument was taken as the most "local" one, typically corresponding to the object position.

Locality effects observed in earlier research are generally attributed to structural position or focus, as objects tend to carry sentential focus, which often corresponds to the most novel or informative part of the sentence, making them more likely to serve as antecedents in ellipsis constructions (Frazier & Clifton, 1998; Carlson, 2013; Carlson et al., 2009; Harris & Carlson, 2016, among others.). However, the locality effect could also be driven by factors like the linear proximity of objects to the remnants, which might be expected under the predictions of retrieval-based processing theories.

Martin and McElree (2011) conducted an SAT procedure and an eye-tracking experiment to investigate the processing of sluicing from a retrieval-based perspective. They examined the effects of distance and the number of potential antecedents on the retrieval of the correct antecedent in sluicing dependencies in sentences like (16). They manipulated the number of potential antecedent positions

(single VP vs. double VP) and the linear distance of the target antecedent (recent vs. distant). In the double VP conditions (16a, c), two VPs (e.g., *slept* and *studied*) appeared in a conjunction preceding the remnant of the sluiced clause, either of which could serve as a potential antecedent. The target antecedent was disambiguated by transitivity: the transitive VP *studied*, which could take a direct object paired with the remnant as its correlate, served as the target, while the intransitive VP, *slept,* acted as the distractor. The linear distance between the target VP *studied,* and the retrieval site, *what* was manipulated so that the target either preceded (distant) or followed (recent) the distractor VP. In the single VP conditions (16b, d), there was only one target VP, *studied*, which was positioned to either precede (distant) or follow (recent) the adverbial phrase, *in the morning*, thereby varying its distance from the remnant.

(16)

a. Recent, Double VP:

   Michael slept and *studied*, but he didn't tell me *what*.

b. Recent, Single VP:

   In the morning, Michael *studied* but he didn't tell me *what*.

c. Distant, Double VP:

   Michael *studied* and slept, but he didn't tell me *what*.

d. Distant, Single VP:

   Michael *studied* in the morning, but he didn't tell me *what*.

(Martin & McElree, 2011, p. 332)

They predicted that the presence of an additional structurally licensed potential antecedent site as in (16a, c) would introduce similarity-based interference in Double VP conditions, thus increasing processing difficulty when identifying the correct

antecedent, especially when the correct antecedent is in a distant position. Their SAT findings revealed that both the number and the recency of antecedent VPs influenced the accuracy of acceptability judgments. Specifically, in Double VP conditions, the accuracy of retrieving the correct antecedent decreased, indicating an effect of similarity-based interference due to the existence of another VP as a potential antecedent site. Importantly, retrieval speed remained unaffected by the number of VPs, lending support to a direct-access cue-based retrieval mechanism.

The eye-tracking results showed increased rereading times at the antecedent and increased reading times and more regressions out of the retrieval site in the Distant and Double VP conditions, indicating an effect of both distance and the number of potential antecedents. These findings suggested that the retrieval process in sluicing is sensitive to interference from structurally cue-matching distractors, with the relative distance of the antecedent further amplifying this effect. This aligns with previous studies on retroactive interference in other types of long-distance dependencies, which demonstrate that the retrieval of information can be disrupted by syntactically cue-matching distractors that appear after the target item in the dependency chain (e.g., Van Dyke & Lewis, 2003; Van Dyke & McElree, 2011).

The studies reviewed in this section highlight how locality, parallelism, distance, and focus influence the processing of sluicing, revealing the complexities of retrieval in ellipsis resolution. Locality effects, observed by Frazier and Clifton (1998) and Harris (2015), showed a preference for associating remnants with the most structurally local correlates, typically in object positions. Frazier and Clifton (1998) found faster processing for ambiguous sentences with lower object NPs as potential correlates, while Harris (2015) demonstrated that structurally local correlates facilitate retrieval, and that interference increases when distractors occupy

the preferred object position. Parallelism effects emphasize the role of feature overlap between remnants and correlates, as observed by Nykiel (2013) and Harris (2015) (see also Lawn & Harris, 2017 for Spanish; Lawn & Harris, 2019 for Brazilian Portuguese; Rasekhi & Harris, 2021 for Persian). Additionally, Martin and McElree (2011) found that retrieval could be modulated by both distance and similarity-based interference in sluicing processing, showing that interference from structurally cue-matching distractors increased when antecedents were distant.

While recent investigations into the retrieval processes involved in sluicing have provided valuable insights and expanded our understanding of this complex aspect of sentence processing, there remains room for improvement in experimental designs, particularly in addressing limitations in previous studies. For instance, Martin and McElree (2011) manipulated the number of antecedent VPs to examine the role of a direct-access, cue-based retrieval mechanism in sluicing dependencies. However, their design manipulated the number of potential antecedents which did not include overt correlates and hence did not include direct manipulations of the cue similarity of potential correlates. This omission limits the study's ability to test parallelism effects in sluicing, which are hypothesized to arise from feature matching between correlates and remnants (e.g., Dickey & Bunger, 2011; Nykiel, 2013; Nykiel et al., 2023; Rasekhi & Harris, 2021, among others). Testing these effects directly by manipulating the degree of feature overlap between correlates and remnants could provide a stronger basis for evaluating cue-based retrieval mechanisms.

Harris (2015) investigated the locality and similarity-based interference effects on the retrieval of correlates in sluicing by manipulating the distance of potential correlates (subject position vs. object position) and the morphological similarity (in number marking) of the distractors to the remnants. However, in their

design, both the target and distractor correlates were in a single antecedent TP. As a result, the distance manipulation resulted in having the target or distractor NPs either in the subject or object position of the antecedent TP, introducing a potential confound on structural features of the potential correlates. That is, subject correlates were linearly more distant to the remnant of the sluiced clause, and they were structurally less embedded and more easily accessible. On the other hand, the object correlates were linearly closer to the remnant of the sluiced clause and were structurally more embedded and more difficult to access. Their design also introduced a potential confound regarding the animacy of the potential correlates changing across local (object correlate) and distant conditions (subject correlate): the potential correlates residing in the subject positions were animate NPs (e.g., *some tourists*) in the distant conditions, and the potential correlates residing in the object positions were inanimate NPs (e.g., *some wines*) in the local conditions. This difference in animacy complicates the interpretation of the observed similarity-based interference effects, making it challenging to disentangle the influence of the intended manipulations of morphological similarity (number marking) from that of semantic similarity (animacy).

Testing the effect of distance directly by manipulating the linear distance of the antecedents by keeping the structural position of correlates constant could provide a stronger basis for evaluating the effect of distance on the antecedents' retrieval. The present study aims to test the effect of distance and cue similarity of the correlates by controlling for the structural position and the semantic and morphological cue similarity of the correlates within a single design. Two eye-tracking experiments and a sentence-completion task were conducted to investigate the effects of similarity-based interference and linear and syntactic distance in

processing sluicing structures in Turkish. Building on the experimental designs of Martin and McElree (2011) and Harris (2015), the present study manipulated the distance and cue similarity of potential retrieval targets. However, unlike Harris' study (2015), which manipulated the position of potential correlates within a single antecedent site (thus also manipulating their structural position), the present study manipulated the linear and syntactic position of the antecedents relative to the retrieval site by keeping the structural cue of the potential correlates constant across potential antecedents (the object). This made it possible to isolate the effects of linear distance from those of structural cues. Also, unlike Martin and McElree (2011), the present study also manipulated the similarity-based interference from correlates by directly manipulating the morphological (case marking) and semantic (animacy) similarity of the correlates to the remnants.

This study investigates how syntactic, morphological, and semantic cues and the effect of distance interact in Turkish sluicing, with Turkish's rich case morphology and highly flexible word order providing an ideal testbed for investigating cue-based retrieval in sluicing dependencies. Different from previous studies that manipulated either distance or cue similarity separately (e.g., Harris, 2015; Martin & McElree, 2011), this study integrates both factors within a single design. By isolating the effects of linear distance while keeping structural positions constant and by testing similarity-based interference by controlling for morphological and semantic cues individually, this study aims to offer a more precise and comprehensive understanding of the retrieval processes in sluicing processing. This study also provides a valuable contribution by highlighting the role of language typology, particularly Turkish, in uncovering how similarity-based

interference and distance effects differ across languages, offering significant implications for cross-linguistic research on sluicing.

Chapter 4 provides a comprehensive description of the present study and further details on the experiments.

CHAPTER 4

THE PRESENT STUDY

In Turkish, processing sluicing dependencies requires comprehenders to verify that the antecedent TP includes the necessary syntactic, semantic, and morphological features. This study examines the role and relative importance of these cues in processing sluicing dependencies in Turkish, utilizing the language's rich case morphology and flexible word order, while also exploring the effect of linear and syntactic distance. Two eye-tracking experiments and a sentence-completion task were conducted.

In Eye-tracking Experiment 1, the participants were asked to silently read sentences containing sluicing dependencies, where two TPs served as potential antecedent sites coordinated by the conjunction *and*, while their eye movements were recorded. The experimental materials manipulated the morphological features (case) and semantic properties (animacy) of the potential correlates, as well as the linear distance of the antecedent to the remnant. Using sluicing dependencies with two coordinated potential antecedent sites allowed for a comparison of the role of semantic and morphological cues when the antecedents had syntactically parallel structures. The experiment had two main aims. The first was to extend the findings of Martin and McElree (2011), which demonstrated syntactic interference effects but did not explore the role of semantic and morphological cues in processing sluicing dependencies. The second was to examine if the locality effect, which facilitates the processing of local correlates (e.g., Harris, 2015), is solely due to the structural position of the correlate or results from retroactive interference when the target

correlate appears in a linearly distant position, with intervening material disrupting retrieval.

Eye-tracking Experiment 2 included sentences with sluicing dependencies involving two TPs one of which was subordinated to another with embedding as potential antecedent sites. Participants were asked to read sentences containing sluicing dependencies, where the antecedents were structurally positioned at different levels of syntactic distance (embedded vs. unembedded), while their eye movements were recorded. The experimental materials manipulated the morphological features of the antecedents and their syntactic distance to the remnant of the sluiced clause. The aim was to explore the role of syntactic distance and its influence on modulating the effectiveness of morphological cues in processing sluicing dependencies. The key research questions were if syntactically embedded antecedents (or distractors) were less accessible for retrieval and/or interference and if this affected the retrieval of the morphological cues associated with them.

Experiment 3 employed a sentence-completion task in which the participants were presented with ambiguous sentences containing sluicing dependencies that had two grammatically acceptable antecedent sites. Participants were asked to choose the antecedent they believed best completed the *e*-site of the sluiced clause. The materials manipulated the linear and syntactic distance of the two antecedent sites (through coordination vs. subordination). This offline task aimed to complement the real-time processing data from the eye-tracking experiments, offering insights into the effect of linear and syntactic distance on participants' final interpretation of sluicing dependencies. By comparing the results across the three experiments, this study aimed to provide a comprehensive account of how cue-based retrieval functions in the processing of sluicing dependencies in Turkish. Turkish provides a

unique advantage for studying these processes due to its rich morphological case-marking system, which allows for precise manipulations of morphosyntactic similarity. Its flexible word order facilitates the separation of linear and syntactic distance effects, making it possible to study these factors independently. These features make Turkish an ideal language for understanding how syntactic, morphological, and semantic cues guide dependency resolution during sentence processing.

4.1 Experiment 1: Eye-tracking Experiment 1

Using eye-tracking methodology, Experiment 1 investigated the effect of retrieval interference in processing sluicing dependencies in Turkish, focusing on the morphological and semantic cues involved in antecedent retrieval and the effect of linear distance. More specifically, it tested if there was any effect of morphological (case) or semantic (animacy) interference from semantically or morphologically similar distractor NPs while retrieving an antecedent for the ellipsis site (i.e., the *e*-site) in a sluicing dependency. It also tested if the linear distance of the antecedent to the remnant affected its retrieval while processing a sluicing dependency. The experimental sentences, therefore, had sluicing dependencies which had two potential antecedent sites coordinated with the conjunction *ve* ("and"). The experimental sentences also manipulated the morphological and semantic similarity between the distractor NP and the remnant as well as the linear distance of the antecedent to the remnant (see Materials Section below for details). The aim of Experiment 1 was to investigate, in Turkish, the effect of similarity-based interference from semantic and morphological cues, and the effect of linear distance of the antecedent to the remnant on processing sluicing dependencies.

4.1.1 Participants

Ninety native speakers of Turkish (56 female, 29 male, five non-binary), with a mean age of 25 (*SD* = 9.77), took part in Experiment 1. Eighty-three of the participants were graduate (*N* = 5) or undergraduate (*N* = 78) students from Bogazici University. The remaining participants (*N* = 7) were volunteers from the Bogazici University community. The graduate and undergraduate students who were registered for one of the predetermined courses in the Linguistics Department earned course credit for participating, whereas the volunteers did not receive any form of compensation. The participants were naive to the study's purpose, and all had normal (*N* = 73) or corrected-to-normal (with glasses or contact lenses) vision (*N* = 17). Participation in the study was entirely voluntary, and informed consent was obtained from all participants before data collection (see Appendix A for Ethics Committee Approval). Before starting the experiment, the participants were requested to complete a background questionnaire (see Appendix B) designed to gather details about their demographic information and linguistic history.

4.1.2 Materials

The experimental sentences, as exemplified in (1), included a sluicing dependency with two TPs preceding the sluiced clause as potential antecedents which were coordinated with the conjunction *ve* "and" (e.g., *birini üzmüş* ve *yazarı eleştirmiş* "upset someone and criticized the author" as in (1a)). The sluiced clause was coordinated to these TPs by the conjunction *ama* "but" (e.g., *birini üzmüş ve yazarı eleştirmiş ama kimi bilmiyorum* "upset someone and criticized the author but I don't know who" as in (1a)). One of the TPs preceding the sluiced clause was the target TP

(*birini üzmüş* “upset someone”), which was the grammatical antecedent of the sluicing dependency while the other TP (*yazarı eleştirmiş* “criticized the author”) served as the distractor TP. The target TP contained an indefinite pronoun object (e.g., *birini* “someone-ACC” as in (1a)) as the correlate which has matching case and animacy features with the remnant (e.g., *kimi* “who-ACC” as in (1a)), followed by the target verb (e.g., *üzmüş* “upset” as in (1a)). The distractor TP contained a definite NP object (e.g., *yazarı* “the author” as in (1a)) as the distractor NP which had either matching or mismatching case and animacy features with the remnant, followed by the distractor verb (e.g., *eleştirmiş* “criticized” as in (1a)).

Experiment 1 had eight conditions manipulating the antecedent’s linear distance (distant, recent) and the semantic and morphological similarity of the distractor (high semantic/high morphological: HighSem/HighMorph, low semantic/high morphological: LowSem/HighMorph, high semantic/low morphological: HighSem/LowMorph, low semantic/low morphological: LowSem/LowMorph). The experimental manipulations were as follows: For Distance, the target TP was either in a linearly distant position in the sentence, preceding the distractor TP (Distant, as in (1a-d)), or in a linearly recent position following the distractor TP (Recent, as in (1e-h)). For Similarity, LowSem/LowMorph conditions contained a distractor NP with no matching case or animacy features with the remnant (as in (1d, h) but with matching syntactic category and structural position (i.e., object NP); LowSem/HighMorph conditions contained a distractor NP with matching case features but mismatching animacy features with the remnant (as in (1b, f)); HighSem/LowMorph conditions contained a distractor NP with matching animacy features but mismatching case features with the remnant (as in (1c, g)); and HighSem/HighMorph conditions contained a distractor NP with

matching cues for both case and animacy features with the remnant (as in (1a, e)). The LowSem/LowMorph condition included similarity only at the level of syntactic category and structural position (i.e., object NP) and can be considered as the baseline with minimum similarity. That is, the distractor NP shared features with the target only with respect to its syntactic category and structural position. The LowSem/HighMorph and HighSem/LowMorph conditions involved morphological or semantic similarity in addition to syntactic category similarity. The HighSem/HighMorph condition included similarity at all levels manipulated.

(1)

a. Distant, HighSem/HighMorph:

Ercan [birin-i$_{\text{correlate}}$ üzmüş$_{\text{target_verb}}$]$_{\text{target\_TP}}$ ve [yazar-ı$_{\text{distractor_NP}}$

Ercan someone-ACC upset-PST-3SG and author-ACC

eleştirmiş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$ ama kim-i$_{\text{remnant}}$ gerçekten

criticize-PST-3SG but who-ACC really

bilmiyorum.

know-NEG-PROG-1SG

'Ercan has upset someone and has criticized the author, but I really don't know who.'

b. Distant, LowSem/HighMorph:

Ercan [birin-i_correlate üzmüş_target_verb]_target_TP ve [film-i_distractor_NP
Ercan someone-ACC upset-PST-3SG and movie-ACC
eleştirmiş_distractor_verb]_distractor_TP ama kim-i_remnant gerçekten
criticize-PST-3SG but who-ACC really
bilmiyorum.
know-NEG-PROG-1SG
'Ercan has upset someone and has criticized the film, but I really don't know who.'

c. Distant, HighSem/LowMorph:

Ercan [birin-i_correlate üzmüş_target_verb]_target_TP ve [yazar-a_distractor_NP
Ercan someone-ACC upset-PST-3SG and author-DAT
gülmüş_distractor_verb]_distractor_TP ama kim-i_remnant gerçekten
laugh-PST-3SG but who-ACC really
bilmiyorum.
know-NEG-PROG-1SG
'Ercan has upset someone and has laughed at the author, but I really don't know who.'

d. Distant, LowSem/LowMorph:

Ercan [birin-i$_{\text{correlate}}$ üzmüş$_{\text{target_verb}}$]$_{\text{target\_TP}}$ ve [film-e$_{\text{distractor_NP}}$

Ercan someone-ACC upset-PST-3SG and movie-DAT

gülmüş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$ ama kim-i$_{\text{remnant}}$ gerçekten

laugh-PST-3SG but who-ACC really

bilmiyorum.

know-NEG-PROG-1SG

'Ercan has upset someone and has laughed at the film, but I really don't know who.'

e. Recent, HighSem/HighMorph:

Ercan [yazar-ı$_{\text{distractor_NP}}$ eleştirmiş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$ ve

Ercan author-ACC criticize-PST-3SG and

[birin-i$_{\text{correlate}}$ üzmüş$_{\text{target_verb}}$]$_{\text{target\_TP}}$ ama kim-i$_{\text{remnant}}$ gerçekten

someone-ACC upset-PST-3SG but who-ACC really

bilmiyorum.

know-NEG-PROG-1SG

'Ercan has criticized the author and has upset someone, but I really don't know who.'

f. Recent, LowSem/HighMorph:

Ercan [film-i$_{\text{distractor_NP}}$ eleştirmiş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$ ve

Ercan movie-ACC criticize-PST-3SG and

[birin-i$_{\text{correlate}}$ üzmüş$_{\text{target_verb}}$]$_{\text{target\_TP}}$ ama kim-i$_{\text{remnant}}$ gerçekten

someone-ACC upset-PST-3SG but who-ACC really

bilmiyorum.

know-NEG-PROG-1SG

'Ercan has criticized the film and has upset someone, but I really don't know who.'

g. Recent, HighSem/LowMorph:

Ercan [yazar-a$_{\text{distractor_NP}}$ gülmüş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$ ve

Ercan author-DAT laugh-PST-3SG and

[birin-i$_{\text{correlate}}$ üzmüş$_{\text{target_verb}}$]$_{\text{target\_TP}}$ ama kim-i$_{\text{remnant}}$ gerçekten

someone-ACC upset-PST-3SG but who-ACC really

bilmiyorum.

know-NEG-PROG-1SG

'Ercan has laughed at the author and has upset someone, but I really don't know who.'

h. Recent, LowSem/LowMorph:

Ercan [film-e_distractor_NP gülmüş_distractor_verb]_distractor_TP ve

Ercan movie-DAT laugh-PST-3SG and

[birin-i_correlate üzmüş_target_verb]_target_TP ama kim-i_remnant gerçekten

someone-ACC upset-PST-3SG but who-ACC really

bilmiyorum.

know-NEG-PROG-1SG

'Ercan has laughed at the film and has upset someone, but I really don't know who.'

The sluiced clause always included an animate object *wh*-remnant *kim* "who" with an accusative, ablative, or dative case.

Twenty-four sentence sets were created as experimental items, each with the eight versions as in (1a-h). There were 192 experimental sentences in total (see Appendix C for the full list of experimental stimuli). Each sentence set was distributed across eight lists counterbalancing for Distance (Distant, Recent) and Similarity (HighSem/HighMorph, LowSem/HighMorph, HighSem/LowMorph, and LowSem/LowMorph). In each list, there were 24 experimental, 72 filler, and five practice sentences, totaling up to 99 sentences. Twenty-four of the filler sentences were the experimental sentences of Experiment 2 (see Section 4.2) which had sluicing dependencies with also two potential antecedent sites, but they included subordination (not coordination) to test the effects of syntactic distance (see Appendix D for the experimental stimuli of Experiment 2). The remaining filler sentences consisted of sentences with interrogative clauses, half with and half without sluicing, similar in length and complexity to the experimental sentences (see Appendix E for the full list of filler items). Fillers with sluicing were in the form of

sprouting, and therefore, they had a non-referential *wh*-remnant (e.g., “why”, “when”, “how”). They also had only one antecedent site preceding the *wh*-remnant. Each sentence, including the filler sentences, was followed by a matching *yes*/*no* comprehension question to ensure attention. Half of the comprehension questions required a *yes* response, and the remaining half required a *no* response regarding the truth value of the statements in the experimental sentences.

4.1.3 Predictions

The aim of Experiment 1 was to investigate the effect of similarity-based interference from semantic and morphological cues and the effect of linear distance of the antecedent to the remnant on processing sluicing dependencies in Turkish.

The cue-based retrieval model predicts that target items, such as the correlate *birini* (“someone-ACC”) in (1a-h), are accessed based on the retrieval cues available at the retrieval site, such as the remnant *kimi* (“who-ACC”) (Van Dyke & Lewis, 2003; Lewis & Vasishth, 2005). In sluicing dependencies, remnants (e.g., *kimi* “who-ACC” in (1a-h)) are hypothesized to provide the necessary cues for retrieving the correlate (e.g., *birini* “someone-ACC”), and the antecedent (e.g., *birini üzmüş* “upset someone”), as seen in (1a). If morphological and semantic retrieval cues guide the antecedent retrieval in Turkish sluicing, distractor NPs sharing similar features, such as case and animacy, with the remnant could interfere with retrieval, making it more difficult to resolve the sluicing dependency due to similarity-based interference. However, it remains unclear whether similarity-based interference applies equally across different types of cues.

Research on animacy cues shows that they play a significant role in the resolution of long-distance dependencies. For example, Van Dyke (2007)

demonstrated that animacy influences the retrieval of subjects in a subject-verb dependency, with animate distractor NPs intervening between the target subject and the verb making the retrieval of the target subject more difficult, highlighting the effect of animacy as a retrieval cue in English. Similarly, Van Dyke and McElree (2011) conducted eye-tracking experiments that further supported the role of animacy in cue-based retrieval. Their findings indicated that semantic interference from animacy cues was stronger when distractors shared both animacy and structural properties with the target while resolving subject-verb dependencies in English.

Previous studies on morphological similarity have shown mixed results. For example, studies on agreement attraction on English subject-verb dependencies showed that a distractor with morphologically similar features facilitates the processing of ungrammatical sentences resulting in a temporary illusion of ungrammaticality (e.g., Bock & Miller, 1991; Pearlmutter et al., 1999; Wagers et al., 2009; Dillon et al., 2013; Parker et al., 2015; Cunnings, 2017, among others). Deniz et al. (2023) found that the processing of subject-verb dependencies in English can also be facilitated in grammatical sentences when a morphologically similar distractor NP intervenes between the verb and its target subject. On the other hand, Uehara and Bradley (1996) and Uehara (2003) found that in Japanese, distractors with similar syntactic case features caused more interference during dependency resolution, especially in center-embedded clauses. Similarly, Bakay (2020) and Bakay and Deniz (2021) examined syntactic and phonological case similarity in Turkish and found that decreased syntactic case similarity between distractors and remnants made processing easier in double center embedded relative clauses (e.g., sentences like *The rat that the cat that the dog chased ate died*), especially in the relatively more demanding contexts (i.e., when the phrase lengths of the embedded

clauses were unbalanced to discourage optimal phrasing). These findings suggest that cue weighting is not uniform across types of dependencies and may vary based on their salience and reliability in specific linguistic contexts and topologies. As such, it remains uncertain whether similarity-based interference affects all cues equally across all types of long-distance dependencies.

If morphological case similarity and animacy cues cause interference in sluicing processing in Turkish as would be predicted by the cue-based retrieval model, the presence of a distractor sharing these features with the remnant is predicted to cause similarity-based interference. This would be reflected as longer fixation durations on or higher probability of regressions out of the retrieval site (e.g., *kimi* "who-ACC" in (1a)), and longer fixation durations on the target words (e.g., *birini* "someone-ACC" and *üzmüş* "upset" in (1a)) when the distractor NP *yazarı* "author-ACC" as in (1a) shared case and animacy features with the target NP *birini* "someone-ACC" as in (1a). That is, the reading times on the target words (e.g., *birini* "someone-ACC" and *üzmüş* "upset" in (1a)) and the reading times and regressions out of the retrieval site (e.g., *kimi* "who-ACC" in (1a)) are predicted to be longest/highest in the HighSem/HighMorph condition such as (1a, e) and the lowest for the LowSem/LowMorph conditions such as (1d, h), with HighSem/LowMorph (1c, g) and LowSem/HighMorph conditions (1b, e) in between.

It is also possible that there would be a difference in the weighing of morphological case similarity and animacy cues. Previous research in brain imaging has shown that semantic and syntactic violations during sentence processing elicit distinct ERP responses, reflecting different cognitive mechanisms. Semantic violations typically produce an N400 response, associated with semantic integration difficulties, while syntactic violations trigger a P600 response, linked to syntactic

reanalysis and repair processes (Friederici et al., 1999; Friederici, 2002; Osterhout & Holcomb, 1992).

In an eye-tracking experiment, Mertzen et al. (2021) also demonstrated that in German subject-verb dependency resolution, syntactic interference effects emerged at the critical verb, while semantic interference appeared later in the post-critical region. In English, however, both syntactic and semantic interference effects were observed simultaneously at the critical verb. They argued that German relies more on morphosyntactic cues, such as case marking, while English balances morphosyntactic and semantic cues, demonstrating that language typology influences how different cues are weighted in resolving subject-verb dependencies, with languages like German prioritizing reliable structural markers over semantic information due to their explicit grammatical systems.

These findings together suggest that syntactic structure might be computed before semantic integration, with morpho-syntactic cues such as case morphology potentially being prioritized over semantic cues like animacy during earlier stages of processing and their prioritization can potentially differ across different language typologies. Like German, Turkish employs morphology highly productively. If reliance on semantic and syntactic cues also differs in the resolution of sluicing structures in Turkish, this would be reflected in the relevant eye-tracking measures for the HighSem/LowMorph and LowSem/HighMorph conditions. Given Turkish's overt case marking system, interference from morphologically similar distractors is predicted to appear earlier than interference from semantically similar distractors.

The cue-based retrieval model predicts that more recent items are retrieved more easily, suggesting that linear distance influences the retrieval of items in long-distance dependencies. This is because activation in memory decays over time and

with the processing of intervening items in a sentence (Lewis & Vasishth, 2005). Supporting this, Van Dyke and McElree (2011) found in SAT and eye-tracking experiments that antecedents in more distant positions were harder to retrieve. Similarly, Harris (2015) observed in an eye-tracking experiment that correlates in distant positions, such as subject positions, were more challenging to retrieve and exhibited stronger interference effects. If the linear distance of antecedents increases retrieval difficulty and susceptibility to interference due to reduced activation levels in the resolution of sluicing structures in Turkish, it is expected that distance and its interaction with interference will influence eye-tracking measures. Specifically, sentences with linearly distant antecedents and closer distractors (e.g., 1a-d) are predicted to show greater slowdowns and increased difficulty due to interference, compared to sentences with linearly recent antecedents and distant distractors (e.g., 1e-h).

4.1.4 Procedure

The experiment was programmed using the Experiment Builder software (SR Research, version 2.5.90), and the eye movements of the participants were recorded at a 1000 Hz sampling rate using an EyeLink 1000 Plus (SR Research, Ottawa, Ontario, Canada) through a desktop mount configuration. The participants had binocular vision throughout the experiment, but the data were collected only from the right eye. During the experiment, the participants were comfortably seated in front of a computer with their heads stabilized with a chin rest. The stimuli appeared on a 21-inch monitor, with a screen resolution of 1920 x 1080 pixels, approximately 83 cm away (according to the recommended display PC position by SR Research manuals, which is 1.75 times the screen width; 1.75 * 475 = 831 millimeters) from

the participant's eyes. The desktop mount of the eye-tracker was placed approximately 50 cm away from the chinrest. The sentences were aligned to the left on the screen and were presented in a single line. The sentences were printed in black on a white background in a monospaced font (Courier New, 18 pts) to ensure all the characters had the same width. Before the experiment, a nine-dot calibration procedure for eye movements was conducted, and the calibration was verified by the experimenter. The experiment started only after successful calibration and validation were confirmed (max error rate = 0.5° of visual angle). To maintain calibration accuracy, a drift check was performed at the beginning of each sentence throughout the experiment.

Before the experiment, the participants were informed that they were to silently read sentences appearing on the screen at their own pace and answer a related *yes*/*no* comprehension question following each sentence. Before the experiment, participants were given five practice sentences along with comprehension questions to help them get accustomed to the procedure. Any questions that the participants may have had were clarified after the practice session. The participants initiated the experiment on their own by pressing the spacebar and they moved from the sentence to the comprehension questions and submitted their answers to questions through a mouse-click. The next sentence appeared after they answered the comprehension question. No feedback was provided on their accuracy. The participants were offered a break halfway through the experiment and most of the participants (90%) took it. The calibration and validation processes were repeated after the break. The experiment, including calibration and validation, took approximately 30 minutes depending on each participant's reading speed.

4.1.5 Data analysis

Data analysis focused on examining commonly used metrics in eye-tracking research, including first fixation duration (FFD), gaze duration (GD), regression path duration (RPD), rereading duration (RRD), total duration (TD), the probability of regression out (PRO), and the probability of regression in (PRI). Each of these measures provides insights into different stages and aspects of cognitive processing during reading (see, e.g., Rayner, 1998; Staub & Rayner, 2007, for a detailed overview of these measures). FFD reflects the time spent on an initial glance at a region, while GD accounts for all fixations within a region before the reader moves on to the next region. RPD captures the total time spent reading a region and any fixations preceding this region. RRD measures subsequent fixations on already-read regions, and TD encompasses the sum of all fixations made for a region. PRO assesses the likelihood of moving back from a region to previously read regions and PRI assesses the likelihood of moving back to a previously read region. FFD and GD are generally considered to reflect early stages of lexical access and initial parsing, while RPD, PRO, and PRI are typically associated with intermediate stages of processing, whereas TD and RRD are generally considered to reflect later processing stages, such as retrieval and reanalysis (Liversedge et al., 1998; Staub & Rayner, 2007; Clifton et al., 2007).

The analyses were conducted on six critical regions: the remnant (e.g., *kimi* "who-ACC" as in (1a)), the spill-over region of the remnant (e.g., *gerçekten* "really" as in (1a)), the correlate (e.g., *birini* "someone-ACC" as in (1a)), the target verb (e.g., *üzmüş* "upset" as in (1a)), the distractor NP (e.g., *yazarı* "the author-ACC" as in (1a)), and the distractor verb (e.g., *eleştirmiş* "criticize-ACC" as in (1a)). Analyses for the remnant and the remnant's spill-over region were conducted for FFD, GD,

RPD, RRD, TD, and PRO measures described in the previous paragraph. However, analyses for the correlate, the target verb, the distractor NP, and the distractor verb were conducted only for RRD, TD, and PRI, because the effect of similarity-based retrieval interference is not expected to manifest in earlier reading measures given that retrieval for the correlate and antecedent is not triggered until the remnant is reached.

The data were exported using the EyeLink Data Viewer software (SR Research Ltd., version 4.4.1) following the pre-processing steps undertaken to eliminate fixations with unusually short or long durations. That is, fixations shorter than 80 milliseconds (ms) were merged with neighboring fixations. Then, fixations shorter than 80 ms and longer than 800 ms were excluded, as it is generally assumed that word recognition typically requires more than 80 ms and cognitive processing during reading occurs within a period of less than 800 ms (Rayner, 1998; Rayner & Pollatsek, 1989).

For the analysis of each eye-tracking measure, linear mixed-effects models were fitted using the *lmer* and *glmer* functions from the *lme4* package (version 1.1-35.5; Bates et al., 2015). Due to the positive skewness and heteroscedasticity observed in residual histograms and plots of reading time data, the reading times were log-transformed to meet the assumptions of normality and homoscedasticity. Log transformation was chosen because it effectively normalizes skewed time data, ensuring a more uniform distribution (Baayen, 2008; Baayen & Milin, 2010). Outliers and overly influential data points were inspected separately for each critical region in the log-transformed data.

4.1.6 Results

The data inclusion criterion for analysis was 80% accuracy for the comprehension questions. Three participants were excluded from the analyses because their accuracy was below 80%. Three other participants were excluded from the analyses because of multiple track losses during the eye recording—two due to interrupted experimental sessions and one due to hand-intrusion during eye-movement recording. Statistical analyses were conducted on the remaining participants (N = 84).

Linear mixed-effects regression models were used to analyze reading times, while linear mixed-effects logistic regression models were employed for analyzing regression-out probabilities. Statistical models built for the analyses included fixed effects for Distance (distant, recent) and Similarity (HighSem/HighMorph, LowSem/HighMorph, HighSem/LowMorph, LowSem/LowMorph). The trial number was also included in the main analyses as a predictor for the trial-by-trial sequence effects such as fatigue and familiarization (Baayen, 2008). The random effects structure consisted of by-participant and by-item intercepts. For Distance, the recent condition was taken as the baseline, and the distant condition was compared to the recent condition in the statistical analyses. For Similarity, the LowSem/LowMorph condition was taken as the baseline, and the LowSem/HighMorph, the HighSem/LowMorph, and the HighSem/HighMorph conditions were compared to the LowSem/LowMorph condition. The trial number was centered and scaled (i.e., z-scores) to reduce multicollinearity among predictors.

The analyses began with simple models that included only one predictor at a time (Distance or Similarity). Then, more complex models were constructed, either by combining the predictor variables (e.g., Distance + Similarity) or by incorporating

interactions between them (e.g., Distance * Similarity). These complex models were compared to their simpler counterparts using log-likelihood ratio tests, and the models that best fit the data were selected for reporting. As an initial trimming for the outliers, the data utilized in the reported models were filtered to exclude any data points with standardized residuals exceeding 2.5 standard errors (Baayen & Milin, 2010). In the model criticism stage, any participants, items, and individual data points that were overly influential were detected and removed from these models based on Cook's Distance measure using the *influence.ME* package (Nieuwenhuis et al., 2012). The findings are presented separately for each critical region in the sections below.

The effect of trial number on eye-tracking measures was examined across all critical regions before the main analyses. At the remnant, FFD, GD, and RPD increased over time (β's $\geq$ .02, t's $\geq$ 2.62, p's $\leq$ .01), while RRD and TD decreased (β's $\leq$ -.05, t's $\leq$ -3.44, p's $\leq$ .001). In the remnant spill-over region, FFD increased (β = .02, t = 2.36, p = .02), while TD decreased (β = -.06, t = -4.57, $p \leq .001$). At the correlate region, both RRD, TD, and PRI (β's $\leq$ -.06, t's $\leq$ -4.57, p's $\leq$ .001; PRI: z = -3.35, $p < .001$) decreased. This pattern of decreasing durations was consistent at the target verb region for RRD, TD, and PRI (β's $\leq$ -.04, t's $\leq$ -2.59, p's $\leq$ .01; PRI: z = -3.52, $p < .001$), at the distractor NP region for RRD, TD, and PRI (β's $\leq$ -.05, t's $\leq$ -2.80, p's $\leq$ .01; PRI: z = -4.34, $p < .001$), and at the distractor verb region for RRD, TD, and PRI (β's $\leq$ -.05, t's $\leq$ -3.30, p's $\leq$ .01; PRI: z = -4.80, $p < .001$). Consequently, trial number was included as a predictor in the statistical models for FFD, GD, RPD, RRD, and TD at the remnant; FFD and TD at the remnant spill-over region; RRD, TD, and PRI at the correlate, target verb, distractor NP, and the distractor verb regions in subsequent analyses.

4.1.6.1 The remnant

Table 1 below presents the mean and standard error values for the remnant region, for the eight conditions and the six eye-tracking measures.

Table 1. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Remnant Region for Experiment 1

	FFD	GD	RPD	RRD	TD	PRO
Distant, HighSem/HighMorph	218 (4.90)	238 (6.54)	287 (21.43)	182 (17.98)	419 (19.59)	.05 (.02)
Distant, LowSem/HighMorph	235 (5.87)	251 (6.88)	286 (13.87)	173 (16.69)	423 (18.68)	.06 (.02)
Distant, HighSem/LowMorph	224 (5.13)	250 (8.18)	336 (30.76)	257 (24.02)	506 (26.97)	.08 (.02)
Distant, LowSem/LowMorph	221 (5.26)	239 (6.81)	315 (29.14)	259 (23.75)	497 (24.86)	.09 (.02)
Recent, HighSem/HighMorph	231 (6.40)	242 (7.16)	307 (21.43)	169 (21.61)	412 (23.01)	.07 (.02)
Recent, LowSem/HighMorph	218 (4.68)	236 (6.78)	331 (28.99)	186 (19.07)	423 (20.87)	.09 (.02)
Recent, HighSem/LowMorph	221 (6.05)	236 (7.72)	280 (16.69)	217 (20.95)	453 (22.40)	.07 (.02)
Recent, LowSem/LowMorph	225 (5.03)	249 (7.39)	283 (12.53)	187 (23.20)	436 (23.70)	0.08 (0.02)

The analyses showed a significant interaction of Distance and Similarity in FFD. That is, the complex model including the interaction of Distance and Similarity explained the data better than the simpler model without interaction (χ^2 (3) = 8.97, p = .03). Figure 2 below summarizes the data for FFD.

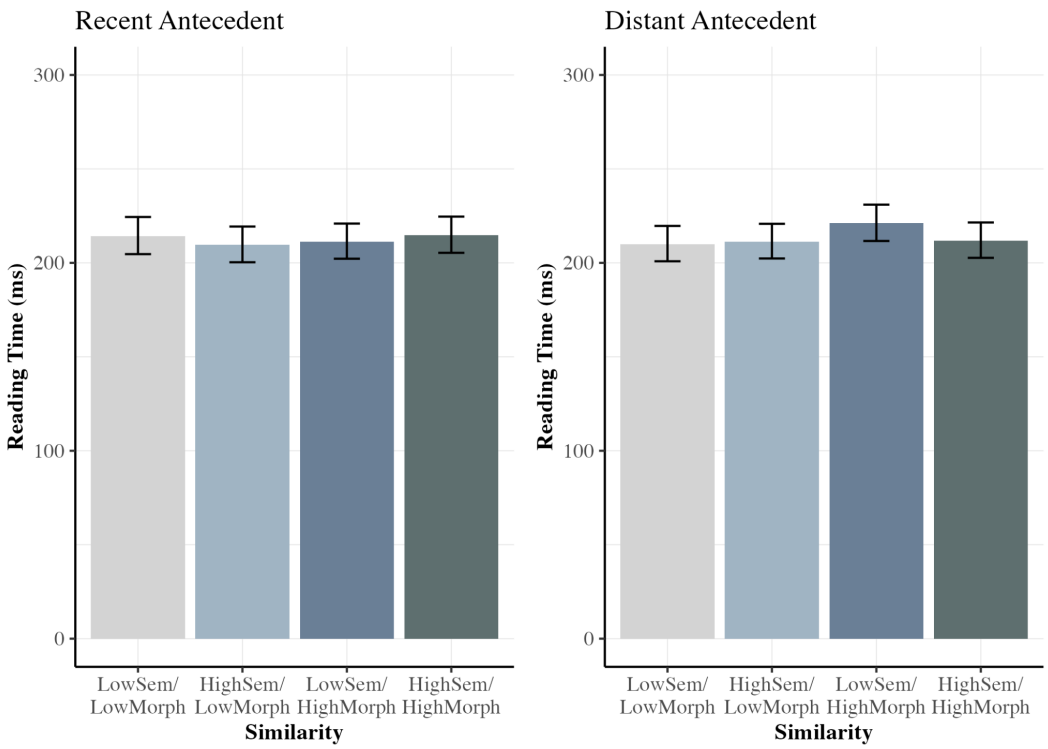

Figure 2. The effect of Similarity on FFD by Distance at the remnant region for Experiment 1

Results of the complex model for FFD revealed an effect of Similarity only in the LowSem/HighMorph condition which led to significantly longer fixations compared to the baseline LowSem/LowMorph condition only for distant antecedents (β = .05, *SE* = .02, *t* = 2.32, *p* = .02). For recent antecedents, there were no significant differences between any of the Similarity conditions (*p*'s ≥ .32). There was also no main effect of distance in FFD at the remnant region (β = -.02, *SE* = .03, *t* = -.85, *p* = .40).

For TD, the complex model combining Distance and Similarity explained the data better than the simple model with Distance as the single predictor (χ^2 (3) = 10.57, *p* = .01) and the simple model with Similarity as the single predictor (χ^2 (1) = 8.56, *p* = .004). Figure 3 below summarizes the data for TD.

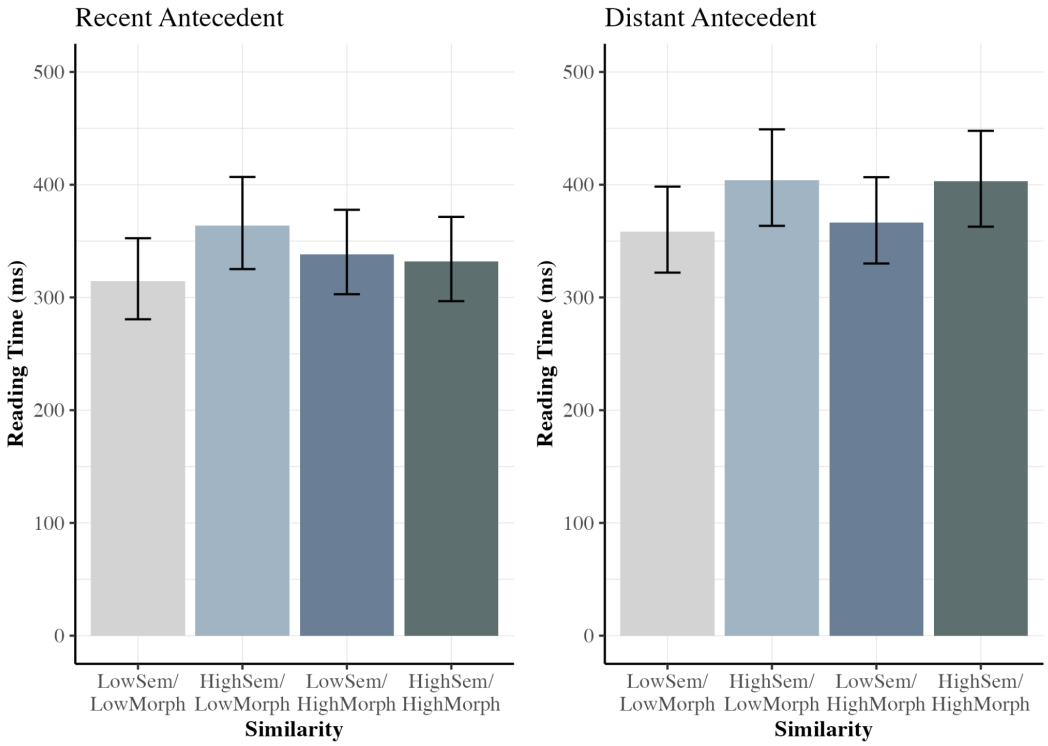

Figure 3. The effect of Similarity on TD by Distance at the remnant region for Experiment 1

Results of the complex model for TD revealed a significant main effect of distance, with distant antecedents leading to significantly longer reading times compared to recent antecedents (β = .13, SE = .03, t = 4.83, p < .001). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, reading times were significantly longer in the HighSem/LowMorph (β = .12, SE = .06, t = 2.21, p = .03) and HighSem/HighMorph (β = .12, SE = .05, t = 2.18, p = .03) conditions as compared to the baseline condition. For recent antecedents, reading times were significantly longer only in the HighSem/LowMorph condition as compared to the baseline condition (β = .15, SE = .05, t = 2.66, p = .01).

There were no effects of Distance or Similarity in any of the remaining measures (Distance: t's ≤ 1.15, p's ≥ .25; and PRO: z = .35, p = .73; Similarity: t's ≤ .91, p's ≥ .37; and PRO: z's ≤ 1.24, p's ≥ .60). For the reported models, any data

points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including 73 data points in FFD, and two participants and 49 data points in TD. Table 2 below summarizes the observed patterns in the remnant region.

Table 2. Data Patterns for the Remnant Region for Experiment 1. > indicates longer reading time; = indicates no significant difference in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
FFD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph > LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph

4.1.6.2 The remnant's spill-over region

Table 3 below presents the mean and standard error values for the remnant's spill-over region, for the eight conditions and the six eye-tracking measures.

Table 3. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Remnant's Spill-over Region for Experiment 1

	FFD	GD	RPD	RRD	TD	PRO
Distant, HighSem/HighMorph	255 (6.89)	322 (11.72)	772 (58.25)	316 (27.28)	638 (30.84)	.35 (.03)
Distant, LowSem/HighMorph	238 (5.65)	297 (9.94)	648 (57.94)	264 (22.83)	561 (25.35)	.28 (.03)
Distant, HighSem/LowMorph	241 (5.80)	305 (9.45)	688 (56.71)	314 (24.04)	619 (27.42)	.30 (.03)
Distant, LowSem/LowMorph	244 (6.21)	307 (11.84)	664 (66.08)	286 (22.30)	593 (25.88)	.25 (.03)
Recent, HighSem/HighMorph	250 (6.02)	307 (9.12)	792 (90.05)	232 (21.44)	539 (22.71)	.25 (.03)
Recent, LowSem/HighMorph	233 (5.22)	297 (10.38)	650 (59.06)	226 (22.07)	523 (24.06)	.28 (.03)
Recent, HighSem/LowMorph	234 (5.67)	299 (10.81)	864 (78.02)	307 (24.87)	606 (27.51)	.31 (.03)
Recent, LowSem/LowMorph	245 (5.67)	308 (9.60)	691 (55.59)	248 (21.93)	556 (23.91)	.28 (.03)

For FFD, only the model with Similarity predicted the data better (χ^2 (3) = 9.15, p = .03) showing that both HighSem/LowMorph (β = -.05, SE = .02, t = -3.00, p = .003) and LowSem/HighMorph (β = -.04, SE = .02, t = -2.48, p = .01) resulted in shorter fixations at the spill-over region than those in the baseline condition. Figure 4 below summarizes the data for FFD.

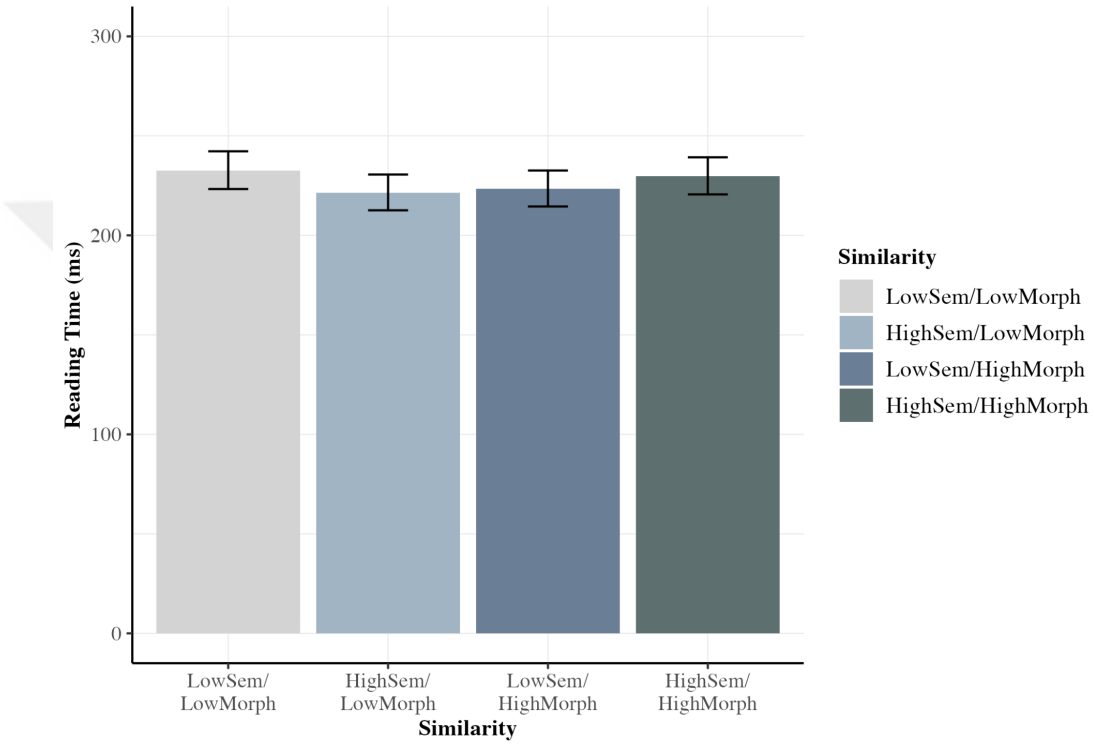

Figure 4. The effect of Similarity on FFD at the remnant's spill-over region for Experiment 1

For TD, the complex model combining Distance and Similarity explained the data marginally better than the simple model with Distance as the single predictor (χ^2 (3) = 7.42, p = .06) and significantly better than the simple model with Similarity as the single predictor (χ^2 (1) = 8.83, p = .003). Figure 5 below summarizes the data for TD.

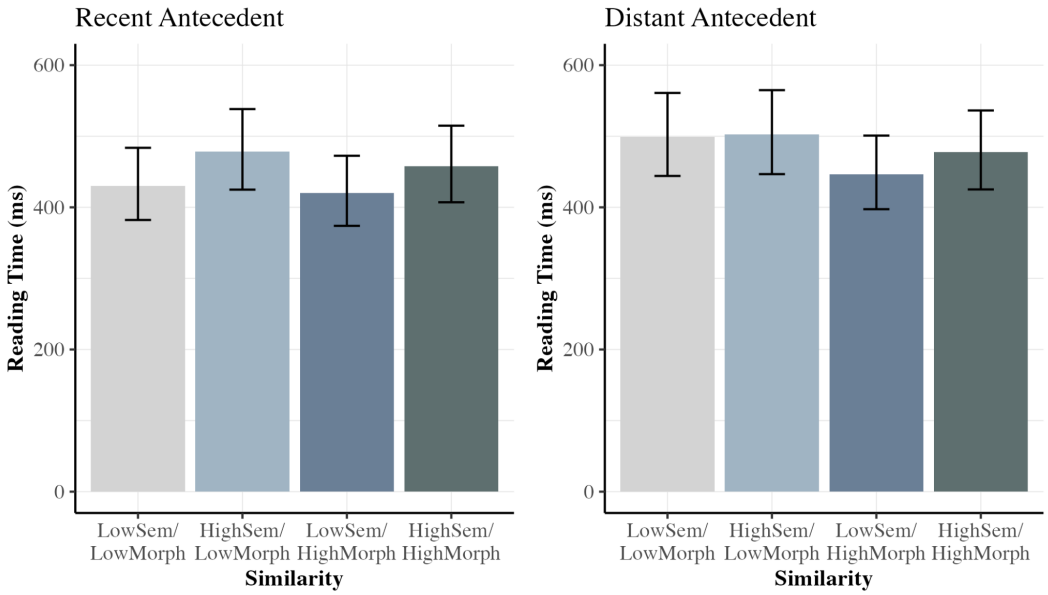

Figure 5. The effect of Similarity on TD by Distance at the remnant's spill-over region for Experiment 1

Results of the complex model for TD revealed a significant main effect of Distance, with distant antecedents leading to longer reading times compared to recent antecedents (β = .08, *SE* = .02, *t* = 3.31, *p* = .001). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, reading times were significantly shorter in the LowSem/HighMorph condition (β = -.11, *SE* = .05, *t* = -2.42, *p* = .02) than in the baseline condition. For recent antecedents, reading times were significantly longer in the HighSem/LowMorph condition (β = .11, *SE* = .05, *t* = 2.29, *p* = .02) than in the baseline condition.

The analyses showed a significant interaction of Distance and Similarity in PRO. That is, the complex model including the interaction of Distance and Similarity explained the data better than the simpler model without interaction (χ^2 (3) = 8.04, p = .05). Figure 6 below summarizes the data for PRO.

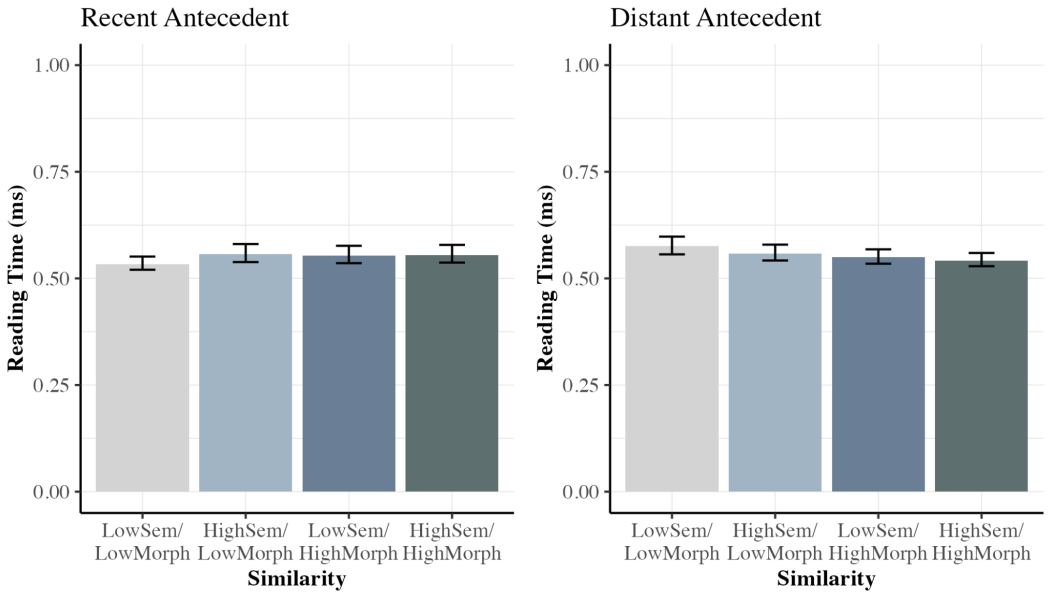

Figure 6. The effect of Similarity on PRO by Distance at the remnant's spill-over region for Experiment 1

Results of the complex model for PRO revealed a significant main effect of Distance, with distant antecedents leading to higher PRO compared to recent antecedents (β = 1.02, *SE* = .24, *z* = 4.15, *p* < 001). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, PRO was significantly lower in the LowSem/HighMorph (β = -.58, *SE* = .23, *z* = -2.53, *p* = .01) and HighSem/HighMorph (β = -.78, *SE* = .24, *z* = -3.29, *p* = .001) conditions as compared to the baseline condition. For recent antecedents, PRO was significantly higher in the HighSem/LowMorph (β = .67, *SE* = .25, *z* = 2.63, *p* = .01), LowSem/HighMorph (β = .59, *SE* = .26, *z* = 2.31, *p* = .02), and HighSem/HighMorph (β = .63, *SE* = .26, *z* = 2.41, *p* = .02) conditions as compared to the baseline condition.

There were no effects of Distance or Similarity in any of the remaining measures (Distance: *t*'s ≤ .94, *p*'s ≥ .35; Similarity: *t*'s ≤ 2.11, *p*'s ≥ .15). For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including one participant and

87 data points in FFD, one participant and 67 data points in TD, and 47 data points in PRO. Table 4 below outlines the observed patterns at the remnant's spill-over region.

Table 4. Data Patterns for the Remnant's Spill-over Region for Experiment 1. > indicates longer reading time; < indicates shorter reading time; = indicates no significant difference in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
FFD	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph < LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph < LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph
PRO	LowSem/HighMorph > LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph < LowSem/LowMorph

4.1.6.3 The correlate

Table 5 below presents the mean and standard error values for the correlate region, for the eight conditions and the six eye-tracking measures.

Table 5. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Correlate Region for Experiment 1

	FFD	GD	RPD	RRD	TD	PRI
Distant, HighSem/HighMorph	230 (6.63)	317 (13.04)	386 (15.44)	495 (34.69)	812 (37.40)	.71 (.03)
Distant, LowSem/HighMorph	220 (5.36)	265 (8.04)	349 (14.08)	458 (29.79)	723 (31.21)	.66 (.03)
Distant, HighSem/LowMorph	217 (4.92)	284 (9.59)	365 (15.50)	490 (28.08)	775 (30.26)	.69 (.03)
Distant, LowSem/LowMorph	224 (5.86)	285 (9.52)	372 (13.94)	549 (35.42)	834 (37.41)	.69 (.03)
Recent, HighSem/HighMorph	251 (5.67)	309 (9.67)	321 (10.89)	297 (25.26)	607 (27.42)	.37 (.03)
Recent, LowSem/HighMorph	243 (5.56)	291 (8.88)	319 (14.10)	298 (22.51)	589 (24.59)	.35 (.03)
Recent, HighSem/LowMorph	251 (5.67)	302 (10.02)	361 (17.70)	409 (27.70)	711 (29.28)	.37 (.03)
Recent, LowSem/LowMorph	240 (4.90)	293 (9.40)	313 (12.01)	341 (26.54)	634 (27.95)	.35 (.03)

For RRD, the complex model combining Distance and Similarity explained the data better than the simple model with Distance as the single predictor (χ^2 (3) = 9.06, p = .03) and the simple model with Similarity as the single predictor (χ^2 (1) = 62.88, p < .001). Figure 7 below summarizes the data for RRD.

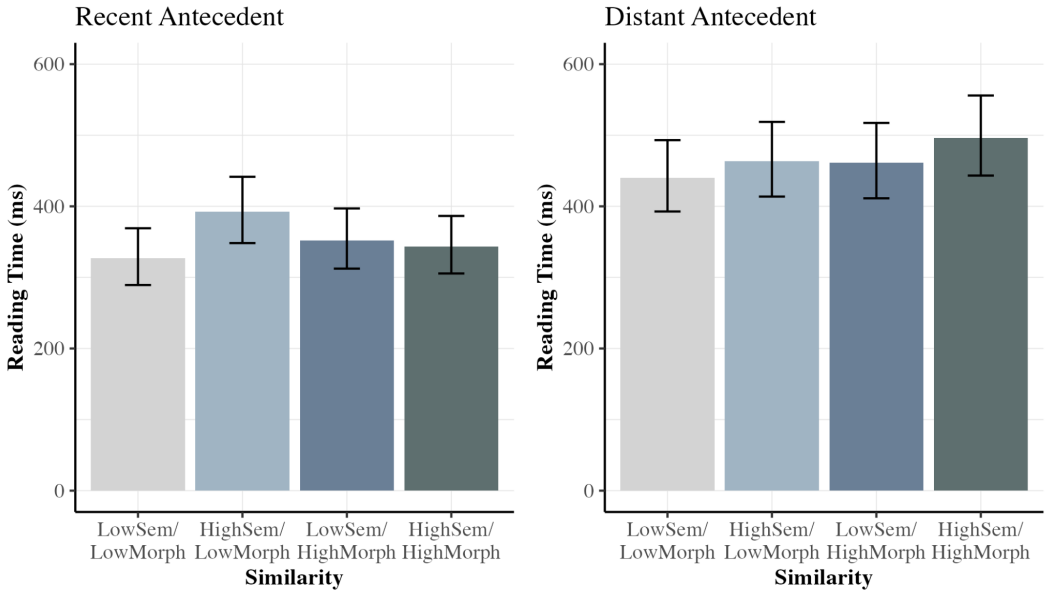

Figure 7. The effect of Similarity on RRD by Distance at the correlate region for Experiment 1

Results of the complex model for RRD revealed a significant main effect of distance, with distant antecedents leading to significantly longer reading times compared to recent antecedents (β = .30, SE = .03, t = 9.83, p < .001). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, reading times were significantly longer in the HighSem/HighMorph condition (β = .12, SE = .06, t = 2.07, p = .04) as compared to the baseline condition. For recent antecedents, reading times were significantly longer in the HighSem/LowMorph condition (β = .18, SE = .07, t = 2.74, p = .01) as compared to the baseline condition.

For TD, the complex model combining Distance and Similarity explained the data better than the simple model with Distance as the single predictor (χ^2 (3) =

14.20, $p = .003$) and the simple model with Similarity as the single predictor (χ^2 (1) = 69.56, $p < .001$). Figure 8 below summarizes the data for TD.

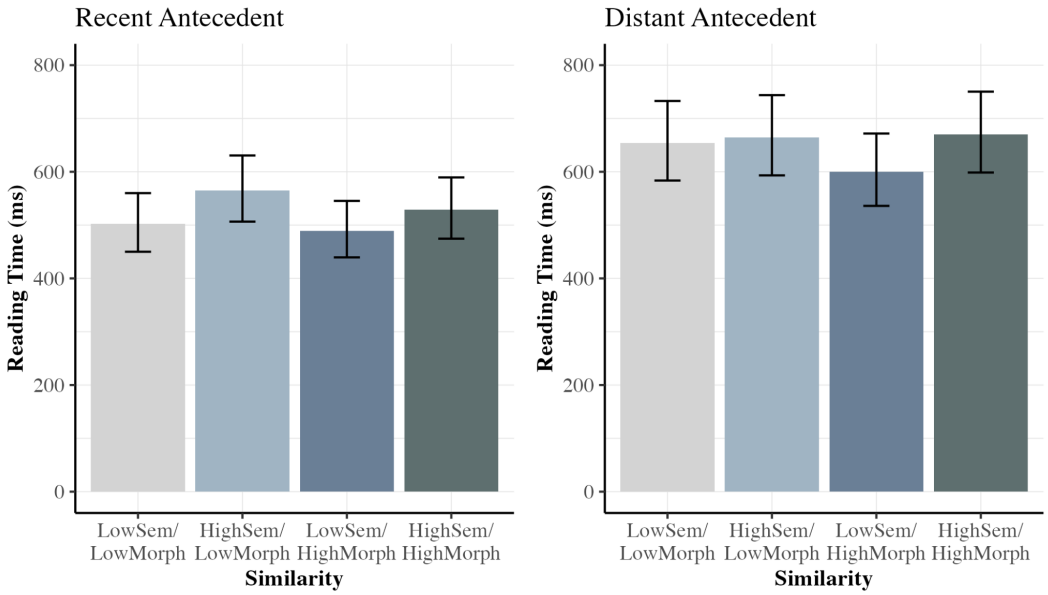

Figure 8. The effect of Similarity on TD by Distance at the correlate region for Experiment 1

Results of the complex model for TD revealed a significant main effect of Distance, with distant antecedents leading to significantly longer reading times compared to recent antecedents ($\beta = .22$, $SE = .02$, $t = 10.09$, $p < .001$). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, reading times were significantly shorter in the LowSem/HighMorph condition ($\beta = -.09$, $SE = .04$, $t = -2.05$, $p = .04$) as compared to the baseline condition. For recent antecedents, reading times were significantly longer in the HighSem/LowMorph condition ($\beta = .12$, $SE = .04$, $t = 2.65$, $p = .01$) as compared to the baseline condition.

For PRI, only the model with Distance predicted the data better (χ^2 (1) = 220.27, $p < .001$) showing that the distant antecedents lead to more regressions into the correlate region compared to the recent antecedents ($\beta = 1.66$, $SE = .12$, $z =$

13.46, $p < .001$). However, there was no effect of Similarity on PRI at the correlate (z's $\leq .89$, p's $\geq .37$).

For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including two participants and 38 data points in RRD, 59 data points in TD, and three participants, one item, and 41 data points in PRI. Table 6 below outlines the observed patterns in the correlate region.

Table 6. Data Patterns for the Correlate Region for Experiment 1. > indicates longer reading time; < indicates shorter reading time; = indicates no significant difference in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
RRD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph

4.1.6.4 Target verb

Table 7 below presents the mean and standard error values for the target verb region, for the eight conditions and the six eye-tracking measures.

For RRD, only the model with Distance predicted the data better (χ^2 (1) = 14.68, $p < .001$), showing that reading times at the target verb were significantly longer for the distant antecedents as compared to the recent antecedents ($\beta = .15$, $SE = .03$, $t = 4.69$, $p < .001$). However, there was no effect of Similarity in RRD at the target verb (t's ≤ 1.30, p's $\geq .57$).

Table 7. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Target Verb Region for Experiment 1

	FFD	GD	RPD	RRD	TD	PRI
Distant, HighSem/HighMorph	252 (6.95)	324 (10.71)	387 (15.26)	393 (29.69)	717 (31.90)	.49 (.03)
Distant, LowSem/HighMorph	244 (6.12)	316 (9.94)	368 (14.99)	393 (31.73)	709 (33.05)	.36 (.03)
Distant, HighSem/LowMorph	246 (6.15)	321 (11.07)	376 (14.51)	408 (25.75)	729 (29.41)	.40 (.03)
Distant, LowSem/LowMorph	248 (6.84)	320 (10.12)	365 (13.13)	453 (26.87)	773 (27.94)	.39 (.03)
Recent, HighSem/HighMorph	275 (6.96)	343 (10.91)	476 (26.06)	309 (24.18)	652 (27.14)	.19 (.02)
Recent, LowSem/HighMorph	260 (5.40)	328 (11.73)	454 (22.95)	319 (26.08)	647 (29.09)	.20 (.03)
Recent, HighSem/LowMorph	264 (6.89)	331 (10.33)	485 (25.85)	357 (22.95)	689 (26.01)	.16 (.02)
Recent, LowSem/LowMorph	269 (6.27)	328 (9.47)	433 (17.57)	289 (22.07)	616 (23.70)	.14 (.02)

The analyses showed a significant interaction of Distance and Similarity in TD. That is, the complex model including the interaction of Distance and Similarity explained the data better than the simpler model without interaction (χ^2 (3) = 8.83, p = .03). Figure 9 below summarizes the data for TD.

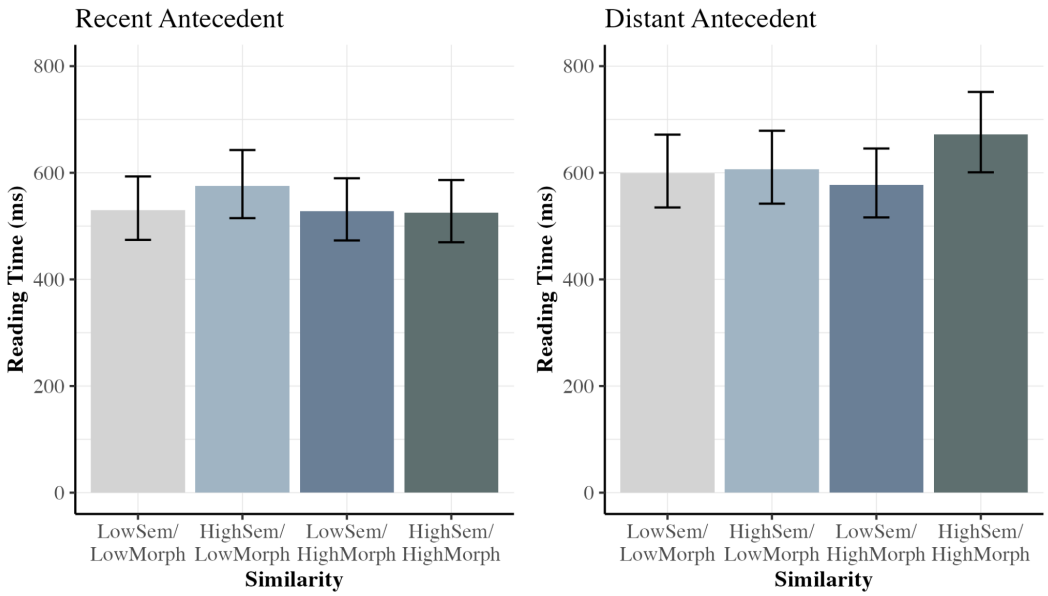

Figure 9. The effect of Similarity on TD by Distance at the target verb region for Experiment 1

Results of the complex model for TD revealed a significant main effect of Distance, with distant antecedents leading to significantly longer reading times compared to recent antecedents (β = .13, *SE* = .04, t = 3.13, p = .002). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, reading times were significantly longer in the HighSem/HighMorph condition (β = .11, *SE* = .04, t = 2.89, p = .004) as compared to the baseline condition. For recent antecedents, reading times were longer in the HighSem/LowMorph condition (β = .08, *SE* = .04, t = 1.94, p = .05) as compared to the baseline condition.

The analyses showed a significant interaction of Distance and Similarity on PRI. That is, the complex model including the interaction of Distance and Similarity explained the data better than the simpler model without interaction (χ^2 (3) = 7.63, p = .05). Figure 10 below summarizes the data for PRI.

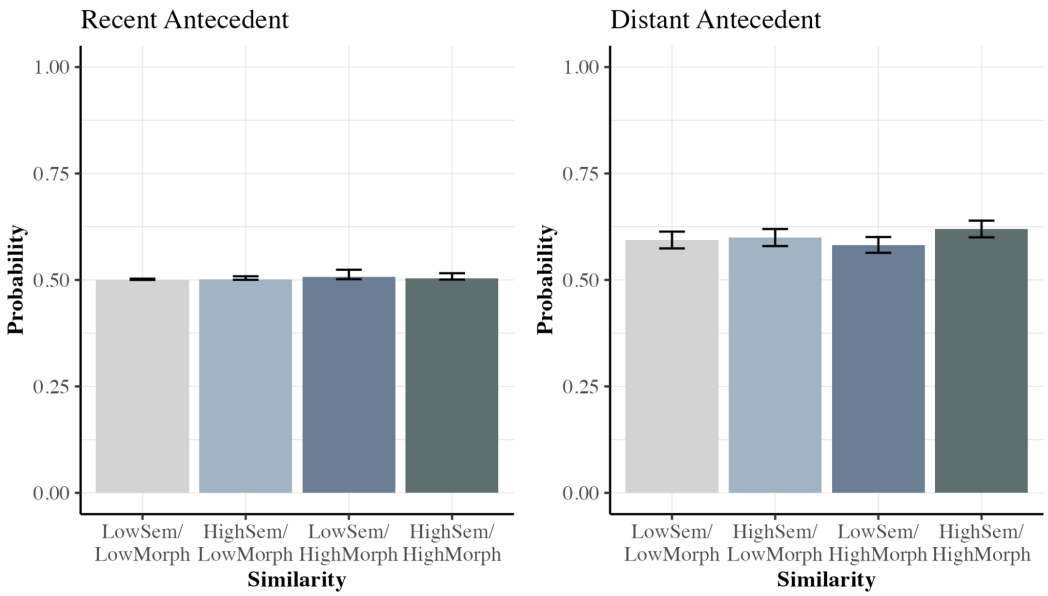

Figure 10. The effect of Similarity on PRI by Distance at the target verb region for Experiment 1

Results of the complex model for PRI revealed a significant main effect of Distance, with distant antecedents leading to significantly longer reading times

compared to recent antecedents (β = 3.67, *SE* = .47, *z* = 7.89, *p* < .001). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents, PRI was significantly higher in the HighSem/HighMorph condition (β = .46, *SE* = .21, *z* = 2.18, *p* = .03) as compared to the baseline condition. For recent antecedents, PRI was higher in the HighSem/LowMorph (β = 1.45, *SE* = .63, *z* = 2.30, *p* = .02), LowSem/HighMorph (β = 2.81, *SE* = .64, *z* = 4.40, *p* < .001), and HighSem/HighMorph (β = 2.27, *SE* = .66, *z* = 3.44, *p* < .001) conditions as compared to the baseline condition.

For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including four participants and 30 data points in RRD, 67 data points in TD, and 88 data points in PRI. Table 8 below outlines the observed patterns in the target verb region.

Table 8. Data Patterns for the Target Verb Region for Experiment 1. > indicates longer reading time; = indicates no significant difference in reading time.

	Recent Antecedent	Distant Antecedent (Recent Distractor)
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
PRI	LowSem/HighMorph > LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph

4.1.6.5 Distractor NP

Table 9 below presents the mean and standard error values for the distractor NP region, for the eight conditions and the six eye-tracking measures.

Table 9. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Distractor NP Region for Experiment 1

	FFD	GD	RPD	RRD	TD	PRI
Distant, HighSem/HighMorph	245 (4.98)	315 (10.45)	355 (17.15)	376 (28.77)	691 (30.84)	.41 (.03)
Distant, LowSem/HighMorph	257 (5.51)	314 (9.02)	346 (12.90)	359 (25.90)	673 (29.33)	.37 (.03)
Distant, HighSem/LowMorph	250 (5.52)	336 (10.39)	391 (17.30)	445 (31.05)	780 (33.55)	.36 (.03)
Distant, LowSem/LowMorph	252 (5.16)	337 (11.14)	390 (18.97)	462 (29.49)	800 (31.62)	.38 (.03)
Recent, HighSem/HighMorph	231 (6.05)	325 (11.41)	441 (24.79)	588 (38.40)	913 (40.26)	.69 (.03)
Recent, LowSem/HighMorph	227 (5.13)	316 (11.32)	403 (14.76)	482 (28.49)	798 (31.77)	.67 (.03)
Recent, HighSem/LowMorph	232 (5.42)	365 (13.11)	488 (19.99)	670 (40.07)	1035 (43.55)	.75 (.03)
Recent, LowSem/LowMorph	230 (5.51)	342 (11.21)	450 (16.76)	554 (34.95)	896 (37.68)	.77 (.03)

For RRD, the complex model combining Distance and Similarity explained the data better than the simple model with Distance as the single predictor (χ^2 (3) = 14.47, p = .003) and the simple model with Similarity as the single predictor (χ^2 (1) = 28.61, p < .001). Figure 11 below summarizes the data for RRD.

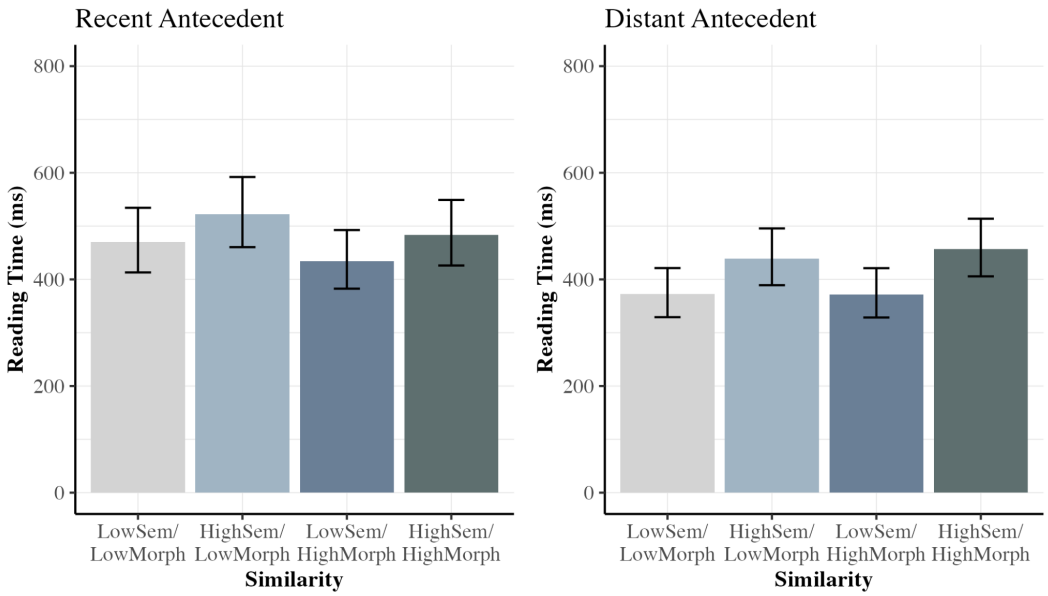

Figure 11. The effect of Similarity on RRD by Distance at the distractor NP region for Experiment 1

Results of the complex model for RRD revealed a significant main effect of Distance, with recent antecedents (i.e., distant distractors) leading to significantly longer reading times compared to distant antecedents (i.e., recent distractors) (β = .17, *SE* = .03, t = 5.10, $p < .001$). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents (i.e., recent distractors), reading times were significantly longer in the HighSem/LowMorph (β = .17, *SE* = .07, t = 2.36, p = .02) and HighSem/HighMorph (β = .20, *SE* = .07, t = 3.02, p = .003) conditions as compared to the baseline condition. For recent antecedents (i.e., distant distractors), no contrasts reached significance (p's ≥ .10).

For TD, the complex model combining Distance and Similarity explained the data better than the simple model with Distance as the single predictor (χ^2 (3) = 33.17, $p < .001$) and the simple model with Similarity as the single predictor (χ^2 (1) = 86.77, $p < .001$). Figure 12 below summarizes the data for TD.

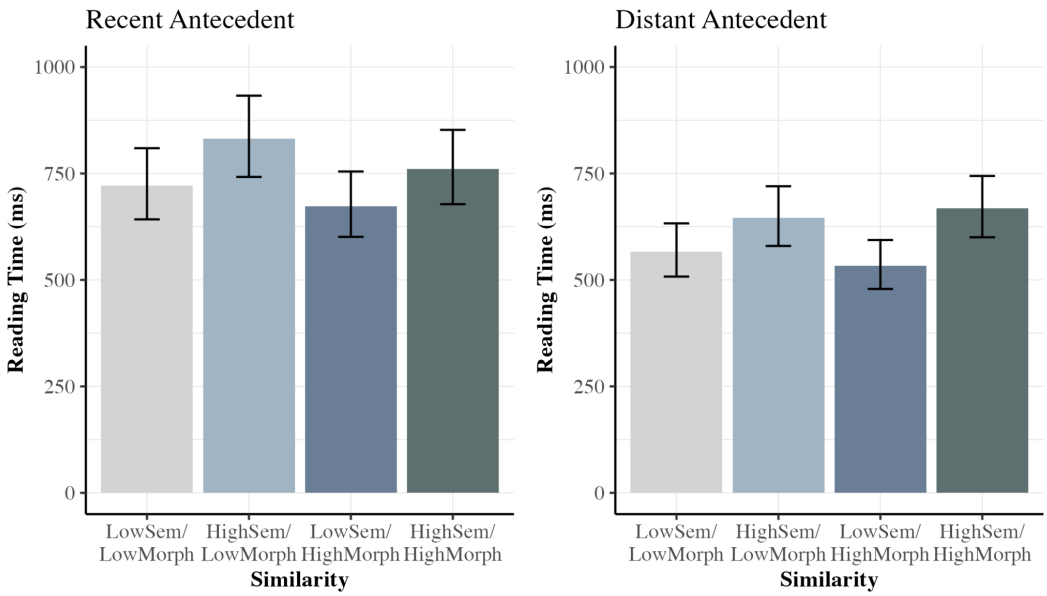

Figure 12. The effect of Similarity on TD by Distance at the distractor NP region for Experiment 1

Results of the complex model for TD revealed a significant main effect of Distance, with recent antecedents (i.e., distant distractors) leading to significantly

longer reading times compared to distant antecedents (i.e., recent distractors) (β = .22, SE = .02, t = 9.18, p < .001). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents (i.e., recent distractors), reading times were significantly longer in the HighSem/LowMorph (β = .13, SE = .05, t = 2.54, p = .01) and HighSem/HighMorph (β = .17, SE = .05, t = 3.25, p = .001) conditions as compared to the baseline condition. For recent antecedents (i.e., distant distractors), reading times were significantly longer in the HighSem/LowMorph (β = .14, SE = .05, t = 3.18, p = .001) condition as compared to the baseline condition.

For PRI, only the model with Distance predicted the data better (χ^2 (1) = 236.36, p < .001) showing that recent antecedents (i.e., distant distractors) lead to more regressions into the distractor NP region compared to distant antecedents (i.e., recent distractors) (β = 1.62, SE = .12, z = 13.94, p < .001). However, there was no effect of Similarity on PRI at the distractor NP (z's ≤ .61, p's ≥ .54).

For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including three participants and 50 data points in RRD, one subject, one item, and 68 data points in TD, and one participant, and 52 data points in PRI. Table 10 below outlines the observed patterns in the distractor NP region.

Table 10. Data Patterns for the Distractor NP Region for Experiment 1. > indicates longer reading time; = indicates no significant difference in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
RRD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph

4.1.6.6 Distractor verb

Table 11 below presents the mean and standard error values for the distractor verb region, for the eight conditions and the six eye-tracking measures.

Table 11. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Distractor Verb Region for Experiment 1

	FFD	GD	RPD	RRD	TD	PRO
Distant, HighSem/HighMorph	272 (7.42)	335 (10.83)	462 (23.80)	300 (24.61)	636 (27.10)	.18 (.03)
Distant, LowSem/HighMorph	258 (5.31)	316 (8.69)	445 (26.68)	334 (26.07)	650 (28.34)	.14 (.02)
Distant, HighSem/LowMorph	251 (6.02)	309 (9.11)	418 (20.83)	360 (25.11)	669 (27.47)	.17 (.02)
Distant, LowSem/LowMorph	261 (6.30)	324 (9.63)	460 (21.89)	339 (22.56)	663 (25.62)	.14 (.02)
Recent, HighSem/HighMorph	245 (6.11)	303 (9.39)	425 (19.97)	380 (26.30)	683 (27.79)	.30 (.03)
Recent, LowSem/HighMorph	241 (5.81)	302 (9.77)	362 (14.56)	329 (20.82)	631 (23.62)	.38 (.03)
Recent, HighSem/LowMorph	262 (7.50)	333 (12.24)	450 (21.55)	458 (29.57)	791 (32.38)	.34 (.03)
Recent, LowSem/LowMorph	248 (5.50)	324 (10.93)	412 (16.99)	353 (25.82)	677 (28.53)	.37 (.03)

For TD, the complex model combining Distance and Similarity explained the data better than the simple model with Distance as the single predictor (χ^2 (3) = 11.46, p = .01) and the simple model with Similarity as the single predictor (χ^2 (1) = 10.22, p = .001). Figure 13 below summarizes the data for TD.

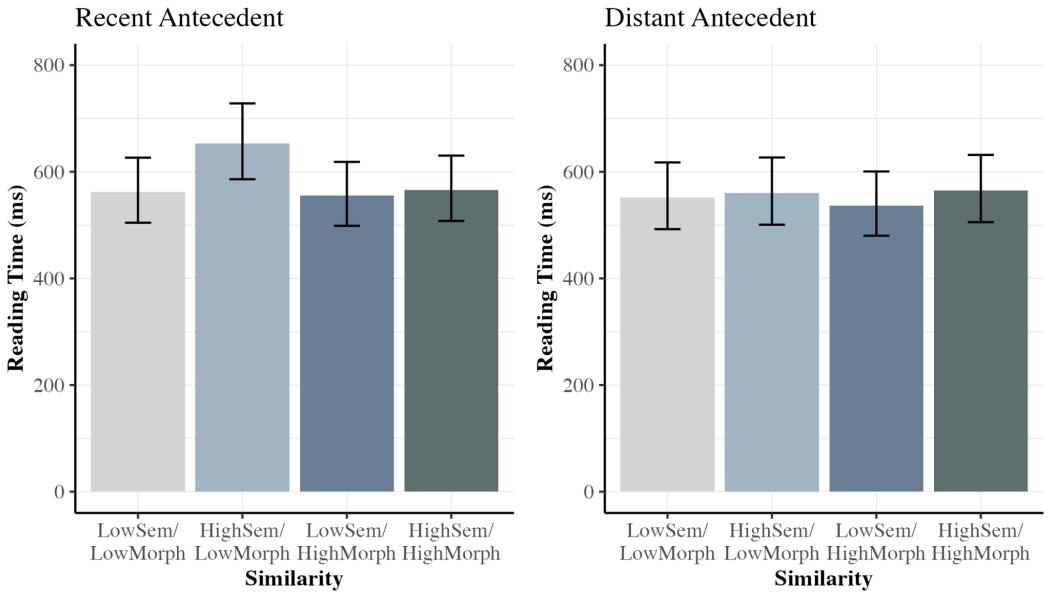

Figure 13. The effect of Similarity on TD by Distance at the distractor verb region for Experiment 1

Results of the complex model for TD revealed a significant main effect of Distance, with recent antecedents (i.e., distant distractors) leading to significantly longer reading times compared to distant antecedents (i.e., recent distractors) (β = .05, SE = .02, t = 2.52, p = .01). Examining the effects of Similarity separately for the distant and recent conditions showed that, for distant antecedents (i.e., recent distractors), no significant differences were observed among any of the Similarity conditions (p's ≥ .54). For recent antecedents (i.e., distant distractors), reading times were significantly longer in the HighSem/LowMorph (β = .15, SE = .04, t = 3.55, p < .001) condition as compared to the baseline condition.

For PRI, only the model with Distance predicted the data better (χ^2 (1) = 236.36, p < .001) showing that recent antecedents (i.e., distant distractors) lead to more regressions into the distractor verb region compared to distant antecedents (i.e., recent distractors) (β = 1.80, SE = .15, z = 11.82, p < .001). However, there was no effect of Similarity on PRI at the distractor verb (z's ≤ 1.02, p's ≥ .31).

For RRD, there was no effect of Similarity (t's ≤ 1.66, p's ≥ .10) or Distance (β = .03, SE = .03, t = 1.05, p = .29) at the distractor verb region. For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including 35 data points in RRD, and 65 data points in TD. Table 12 below outlines the observed patterns in the distractor verb region.

Table 12. Data Patterns for the Distractor Verb Region for Experiment 1. > indicates longer reading time; = indicates no significant difference in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph

4.1.6.7 Summary of the results

The results of Experiment 1 revealed significant effects of both Distance and Similarity, with the impact of Similarity varying depending on the specific interference condition and the distance of the antecedent. The results are summarized below in two groups: findings related to the remnant and its spill-over region where the sluicing dependency is predicted to be resolved, and findings from the target and distractor antecedent sites where the effects of cue-encoding or reanalysis are expected to occur.

The effect of Similarity at the retrieval site showed differences across Distance conditions and different eye-tracking measures. Table 13 below outlines the observed Similarity patterns at the remnant and its spill-over region.

Table 13. Data Patterns for the Retrieval Site Regions for Experiment 1. > indicates longer reading time; < indicates shorter reading time; = indicates no significant differences in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
The remnant region:		
FFD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph > LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
The remnant's spill-over region:		
FFD	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph < LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph < LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph
PRO	LowSem/HighMorph > LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph < LowSem/LowMorph

At the remnant region, the data showed that only the LowSem/HighMorph condition caused a slowdown in the earlier measures (FFD), only when the antecedent was distant, while no effect of interference was observed in the HighSem conditions in the early measures. On the other hand, the results showed an effect of interference in the HighSem conditions in later measures (TD), with a significant slowdown in the HighSem/LowMorph condition for recent antecedents, and a significant slowdown in the HighSem/LowMorph and HighSem/HighMorph condition for distant antecedents.

At the spill-over region, both the HighSem-only (HighSem/LowMorph) and HighMorph-only (LowSem/HighMorph) conditions caused speedups in earlier measures (FFD) while the HighSem/HighMorph condition did not differ from the LowSem/LowMorph condition. When examining later measures (TD), the HighSem-

only (HighSem/LowMorph) condition led to slowdowns for recent antecedents, while the HighMorph-only (LowSem/HighMorph) condition led to speedups for distant antecedents. Additionally, all three conditions with semantic, morphological, and combined (semantic and morphological) similarity (LowSem/HighMorph, HighSem/LowMorph, HighSem/HighMorph) led to more regressions out of the spill-over region when the target antecedent was recent. However, the HighMorph (LowSem/HighMorph, HighSem/HighMorph) conditions led to fewer number of regressions when the target antecedent was distant.

Lastly, Distance had an overall effect on the processing of the retrieval site which emerged only in later measures (TD, PRO), causing slow-downs at and higher number of regressions out of the remnant and the spill-over region.

The effect of Similarity on the target and distractor antecedent sites also showed differences across Distance conditions and different eye-tracking measures. Table 14 below outlines the observed Similarity patterns at the target and distractor antecedent sites. At both the target and the distractor antecedent sites, the effect of Similarity on RRD was only observed in the NPs (correlate and the distractor), not in the verbs (target and distractor). The HighSem conditions (HighSem/LowMorph, HighSem/HighMorph) resulted in longer RRD for both target and distractor regions. There was an effect of Similarity on PRI which was only observed in the target verb region, resulting in higher PRI in all three high similarity conditions (LowSem/HighMorph, HighSem/LowMorph, HighSem/HighMorph) when the target antecedent was recent, and resulting in higher PRI in the HighSem/HighMorph condition when the antecedent was distant.

Table 14. Data Patterns for the Target and Distractor Regions for Experiment 1. > indicates longer reading time; < indicates shorter reading time; = indicates no significant differences in reading time.

	Recent Antecedent (Distant Distractor)	Distant Antecedent (Recent Distractor)
Target regions:		
RRD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph	LowSem/HighMorph < LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
PRI	LowSem/HighMorph > LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph = LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
Distractor regions:		
RRD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph
TD	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph > LowSem/LowMorph	LowSem/HighMorph = LowSem/LowMorph HighSem/LowMorph > LowSem/LowMorph HighSem/HighMorph = LowSem/LowMorph

There was also an effect of Similarity on TD, which was observed at both target and distractor NPs and verbs. The HighSem/LowMorph condition resulted in longer TD in both target and distractor regions, while the LowSem/HighMorph condition resulted in speedup only at the correlate and only when the target antecedent was distant. At the distractor antecedent region, the HighSem conditions (HighSem/LowMorph, HighSem/HighMorph) resulted in longer TD.

Lastly, Distance had an overall effect on the processing of the antecedent sites, causing longer fixations for distant target and distractor antecedents compared to the recent target and distractor antecedents in both RRD and TD and in both correlate and verb regions.

4.1.7 Discussion

Experiment 1 investigated the effect of similarity-based interference on the real-time processing of sluicing in Turkish sentences with two potential antecedent sites that were coordinated. The study examined the role of morphological and semantic retrieval cues, as well as the influence of the linear distance of the antecedent, using an eye-tracking methodology. There were three main findings. First, distant antecedents made the processing of sluicing in Turkish overall more challenging. Participants spent more time reading the retrieval and target sites when the antecedent was linearly distant from the remnant. Second, both semantic and morphological similarity influenced the processing of sluicing, with their effects varying depending on the antecedent's linear distance (distant vs. recent). Specifically, the effect of semantic similarity was more generalized over distant and recent conditions and slightly pronounced when the target antecedent was recent and the distractor antecedent was distant (i.e., proactive interference). On the other hand, morphological similarity had a stronger impact when the target antecedent was distant and the distractor antecedent was recent (i.e., retroactive interference). Third, the effects of semantic and morphological similarity, as well as their combined influence, differed in timing and direction. Semantic similarity mostly led to slowdowns at both the retrieval site and the target antecedent regions, particularly in later measures (TD, RRD, PRO, PRI). In contrast, the effect of morphological similarity was more heavily observed at the retrieval site, causing slowdowns in the remnant region in early measures (FFD) but speedups in later regions. The effect of linear distance and similarity-based interference will be discussed separately in the sections below.

4.1.7.1 The effect of linear distance

The results indicated a significant effect of linear distance in the online processing of sluicing dependencies in Turkish, with distant antecedents making the resolution of the sluicing dependencies overall more difficult. That is, participants experienced slowdowns at the retrieval site when the target antecedent was distant from the remnant (TD, PRO) and at both the target and distractor antecedent sites when they were linearly distant from the remnant (RRD, TD). This finding aligns with the locality effect observed in previous research on sluicing processing (e.g., Frazier & Clifton, 1998; Carlson, 2013; Carlson et al., 2009; Harris, 2015; Harris & Carlson, 2016). However, since the structural positions of the correlates and verbs in the coordinated antecedents were parallel, and neither the correlates nor the verbs carried distinct sentential focus, the effect appears to be driven by linear proximity rather than structural position or sentential focus. This challenges the locality bias hypothesis (Harris, 2015), which posits that human parsers prefer to associate the remnant of a sluicing construction with a correlate in object position, arguing that objects are structurally more local to the sluicing remnant. In contrast, the results of Experiment 1 showed that linearly distant antecedents increased the processing difficulty of the sluiced clause, even when the structural position and focus of the correlates were kept constant across conditions. Thus, the observed effect of linear distance is more in line with the activation-decay prediction of the cue-based retrieval model, which suggests increased difficulty in processing a linguistic dependency when the target and the probe are at a greater distance, as also argued by Martin and McElree (2011). This is because activation of the items in memory decays over time and with the processing of the intervening material between the

retrieval site and the target item (Van Dyke & Lewis, 2003; Lewis & Vasishth, 2005).

The effect of distance was notably evident in later measures, such as RRD, TD, and PRO. This pattern mirrors the findings by Martin and McElree (2011), who observed longer rereading times and increased regressions out of the retrieval site for distant antecedents in English sluicing constructions. They suggested that when the retrieved information is unclear or incomplete, readers often revisit the antecedent region to reanalyze it and build a coherent interpretation. Similarly, the findings in Turkish sluicing dependencies might suggest that participants engaged in more detailed analysis and reanalysis when the retrieval site was separated from the targets by intervening distractors, necessitating additional cognitive effort to resolve the dependency.

4.1.7.2 The effect of similarity-based interference

The results revealed significant effects of interference from semantically and morphologically similar distractors, observed at both the retrieval site and the antecedent sites. However, the effects of semantic and morphological similarity differed based on the antecedent's linear distance from the remnant, as well as their timing, direction (facilitatory vs. inhibitory), and distribution across critical regions.

The effect of semantic similarity was observed both at the retrieval site and the potential antecedent sites, predominantly in later measures (RRD, TD, PRO, PRI). At the remnant, semantic similarity caused an inhibitory effect resulting in longer TD in both HighSem/LowMorph and HighSem/HighMorph conditions for both recent and distant antecedents. For recent antecedents, the inhibitory effect of semantic similarity persisted in the spill-over and target antecedent regions in both

HighSem/LowMorph and HighSem/HighMorph, as shown by longer TD and PRO in the spill-over region and longer PRI in the target antecedent region. For distant antecedents, the inhibitory effect of semantic similarity also emerged in target and distractor regions as increased RRD and PRI. This suggests that the inhibitory effect of semantic similarity led to a longer analysis of the retrieval site and possible reanalysis of the target regions, independently of the target's linear distance. The observed inhibitory effects of semantic interference in the recent condition aligned with previous findings on long-distance dependencies, where semantic interference disrupts retrieval and processing (e.g., Van Dyke, 2007; Van Dyke & McElree, 2011).

The effect of morphological similarity emerged in the remnant region only for distant antecedents, causing an initial slowdown at the remnant region in early measures (FFD), followed by a speedup in the spill-over region in both early (FFD) and late measures (TD, PRO). Morphological similarity also led to reduced TD at the correlate when the target antecedent was distant. The results suggest that morphological similarity might have caused a facilitatory effect in the contexts where the target was linearly distant, as evidenced by speedups at the retrieval site and decreased reading times at the target region, possibly due to the linearly closer distractor NP with matching case features being misinterpreted as the correlate. The apparent slowdowns in earlier measures at the retrieval site, followed by decreased reading times in later measures at the spill-over and antecedent regions, suggest that morphological interference initially hindered processing but later facilitated it by favoring the distractor NP as the correlate, possibly without participants realizing the error. The facilitatory effect of morphological similarity observed in retroactive contexts (i.e., distant target, recent distractor) aligns with findings from English

subject-verb dependencies, where morphologically similar distractors have been shown to ease processing in grammatical sentences when a morphologically similar distractor NP intervenes between the verb and its target subject, as observed by Hammerly et al. (2019) and Deniz et al. (2023). This finding seems to be also in line with the cue-based memory retrieval model, which predicts facilitation from a cue-matching distractor under the assumption that the distractor has higher activation than the target, higher activation being predicted for linearly closer items (Lewis & Vasishth, 2005; Jäger et al., 2017).

Interestingly, in the recent conditions, the effect of morphological similarity emerged only in later regions (spill-over and antecedent regions) and measures (TD, RRD, PRI, PRO), and as an inhibitory effect, especially when combined with semantic similarity (the HighSem/HighMorph condition). Although this looks contradictory to the findings in the distant condition where morphological similarity led to facilitation, the findings in the recent condition might be explained by the predictions of the cue-based memory retrieval model. In the cue-based memory retrieval model, the probability of retrieval is dependent on the activation levels of memory items, and the activation levels are subject to temporal decay as the distance between the target and the retrieval sites increases (Lewis & Vasishth, 2005). In the recent condition, the target was relatively closer to the remnant, and it had higher activation levels than the distractor (Lewis & Vasishth, 2005). Thus, even though the morphological and semantic similarity of the distractor might have caused interference with the target's retrieval, this interference couldn't have blocked the target's retrieval due to having higher activation than the distractor, resulting in slower retrieval and increased reanalysis of the target instead of facilitation by incorrectly retrieving the distractor.

The results also revealed differences in the timing and localization of semantic and morphological similarity effects. The effect of morphological similarity emerged earlier, predominantly at the retrieval site, whereas the effect of semantic similarity appeared later, particularly at potential antecedent sites. Previous neuroimaging studies on semantic and syntactic violations in sentence processing have suggested that syntactic processing precedes semantic integration during sentence comprehension (e.g., Friederici et al., 1999; Friederici, 2002; Osterhout & Holcomb, 1992). In line with these findings, the earlier effects observed for morphological similarity likely reflect reliance on initial morphosyntactic integration. Also, in line with previous findings, the later effects observed for semantic similarity might indicate a later stage of processing focusing on the integration of semantic cues and the reanalysis of the dependency representations. These timing and localization differences might also explain the observed differences between the distinctive effects of semantic and morphological similarity under different distance conditions. The facilitatory effects observed for morphological similarity by itself in the distant conditions might reflect that the retrieval system initially relied on morphosyntactic cues, as observed by faster processing when there was a linearly closer case-matching distractor with higher activation levels. However, in recent conditions, and when combined with semantic similarity, the initial facilitatory effect of morphological similarity might have been followed by the late-coming effect of similarity, which arose during the integration of semantic cues. In that stage, semantic similarity between the target and the distractor might have caused a reanalysis of the target regions, resulting in an inhibitory effect.

These findings on the distinct timing of morphological and semantic similarity effects are also consistent with previous findings of Van Dyke (2007) who

also observed that the effect of syntactic similarity at the critical region while the effect of semantic similarity emerged only in later regions and argued that semantic effects arose later because semantic integration comes later than syntactic integration. In contrast, Mertzen et al. (2021) reported earlier morphological interference effects in subject-verb dependencies in German but not in English, attributing these differences to the prioritization of case marking in German due to its overt case-marking system. Similarly, the current findings may also suggest that in Turkish, morphosyntactic cues such as case marking are prioritized over semantic cues in the resolution of sluicing dependencies because Turkish also has an overt case-marking system. The findings of Experiment 1 lend support to both arguments by showing that the time course differences between the effects of semantic and morphological interference in Turkish sluicing resolution may be influenced by both language typology and differences in the cognitive mechanisms underlying the processing of semantic and syntactic cues.

In summary, while morphological similarity facilitated processing in distant antecedent conditions, semantic similarity caused inhibitory effects regardless of the antecedents' linear distance. One possible interpretation of this finding is that the parser predominantly relies on morphosyntactic cues, such as case marking, to resolve dependencies over longer distances. This reliance might have facilitated the retrieval by correctly identifying the case-matching item with the highest activation levels, which was the target in recent conditions. However, in more demanding contexts such as when the target is distant and the distractor is more recent, this faster processing might result in incorrect retrieval of the case-matching distractor item. In contrast, semantic similarity may have led to inhibitory effects regardless of the antecedents' linear distance, as the integration of semantic cues occurs at a later

stage than morphosyntactic integration. In line with previous research (e.g., Friederici, 2002; Osterhout & Holcomb, 1992, Van Dyke, 2007; Mertzen et al., 2021), the observed differences in the timing of these effects suggest an initial reliance on morphosyntactic cues, which might have further amplified especially in languages like Turkish which has overt case marking systems that might prioritize morphosyntactic information over semantic cues during long-distance dependency resolution. This higher reliance on morphosyntactic information might have caused further prioritization of morphological cues in earlier stages of processing, hence resulting in incorrect retrieval of a linearly more recent distractor when it matched morphological retrieval cues but not when it matched the semantic retrieval cues of the remnant.

4.2 Experiment 2: Eye-tracking Experiment 2

Experiment 1 examined the effects of morphological and semantic cues and the linear distance on antecedent retrieval during the processing of sluicing dependencies in Turkish in an eye-tracking experiment. The results indicated that antecedent retrieval was affected by both semantic and morphological interference and the linear distance between the antecedent and the remnant. Experiment 2 was also an eye-tracking experiment examining the real-time processing of sluicing dependencies in Turkish. However, unlike Experiment 1, Experiment 2 tested the effects of syntactic distance and morphological cues involved in antecedent retrieval. In Experiment 1, the potential antecedent sites were coordinated clauses, which had hierarchically parallel structures. This manipulation allowed for a focus on the linear distance of the antecedents and the distractors relative to the remnant. Experiment 2 manipulated the syntactic distance of the antecedent sites. That is, the antecedent TP was either in the

matrix clause while the distractor TP was in the embedded clause, or the antecedent TP was in the embedded clause and the distractor TP was in the matrix clause. The morphological similarity between the distractor NP and the remnant was also manipulated. This manipulation allowed for investigating the effect of syntactic distance on cue weighting during retrieval. Note that the manipulation of syntactic distance also affected the linear distance of the antecedents and the distractors relative to the remnant; thus, the linear distance of the correlate to the remnant was also manipulated to prevent any confounding effect from the correlate's linear distance (see Materials Section below for details).

4.2.1 Participants

The participants were the same as those in Experiment 1.

4.2.2 Materials

The experimental sentences, as exemplified in (2), included a sluicing dependency with two TPs preceding the sluiced clause as potential antecedent sites. The first part of the sentences contained the antecedent sites (e.g., *birinden korktuğunu* "that he is afraid of someone" and *patrondan gizlemiş* "he hid from the boss" as in (2a)) and they were followed by the sluiced clause which was coordinated to the first part of the sentence by the conjunction *ama* "but". One of the TPs preceding the sluiced clause was the target TP (*birinden korktuğunu* "that he is afraid of someone"), which was the grammatical antecedent of the sluicing dependency while the other TP acted as the distractor (*patrondan gizlemiş* "he hid from the boss"). The target TP was either in an embedded clause as in (2a-d) or in a matrix clause as in (2e-h). The target TP contained an animate indefinite pronoun object as the correlate (e.g., *birinden*

"someone-ABL" as in (2a)) which had matching case features with the remnant ((e.g., *kimden* "who-ABL") as in (2a)). The distractor TP contained an animate definite NP object as the distractor NP (e.g., *patrondan* "the boss-ABL" as in (2a)) which had either matching or mismatching case features with the remnant.

Experiment 2 had eight conditions manipulating Syntactic Distance of the antecedent TP to the remnant (unembedded antecedent: Unembd, embedded antecedent: Embd), Morphological Similarity from the distractor NP (low morphological similarity: LowMorph, high morphological similarity: HighMorph), and Linear Distance of the correlate to the remnant (recent, distant). The experimental manipulations were as follows: For Syntactic Distance, in the Embd conditions, the target antecedent was in the embedded clause and the distractor TP was in the matrix clause as in (2a-d); in the Unembd conditions, the target antecedent was in the matrix clause and the distractor TP was in the embedded clause as in (2e-h). For Morphological Similarity, the HighMorph conditions contained a distractor NP with matching case features with the remnant as in (2a, c, e, g), and the LowMorph conditions contained a distractor NP with no matching case features with the remnant as in (2b, d, f, h). The LowMorph condition had similarity only at the level of syntactic category and animacy (i.e., animate object NP) and can be considered as the baseline with minimum morphological similarity. The HighMorph condition had morphological similarity in addition to similarity in syntactic category and animacy. For Linear Distance, the correlate was either in a linearly distant position in the sentence, preceding the distractor NP (Distant, as in (2a, b, e, f)), or in a linearly recent position following the distractor NP (Recent, as in (2c, d, g, h)).

(2)

a. Embd, HighMorph, Distant:

Serkan [[birin-den$_{correlate}$ korktuğunu$_{target_verb}$]$_{target\_TP}$

Serkan someone-ABL afraid-NML-3SG.POSS-ACC

patron-dan$_{distractor_NP}$ güçlükle gizlemiş$_{distractor_verb}$]$_{distractor\_TP}$ ama

boss-ABL hardly hide-PST-1SG but

kim-den$_{remnant}$ maalesef bilmiyorum.

who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly hidden that he is afraid of someone from the boss, but unfortunately I don't know who.'

b. Embd, LowMorph, Distant:

Serkan [[birin-den$_{correlate}$ korktuğunu$_{target_verb}$]$_{target\_TP}$

Serkan someone-ABL afraid-NML-3SG.POSS-ACC

patron-a$_{distractor_NP}$ güçlükle söylemiş$_{distractor_verb}$]$_{distractor\_TP}$ ama

boss-ACC hardly tell-PST-1SG but

kim-den$_{remnant}$ maalesef bilmiyorum.

who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly said that he is afraid of someone from the boss, but unfortunately I don't know who.'

c. Embd, HighMorph, Recent:

Serkan [patron-dan$_{\text{distractor_NP}}$ [birin-den$_{\text{correlate}}$

Serkan boss-ABL someone-ABL

korktuğunu$_{\text{target_verb}}$]$_{\text{target\_TP}}$ güçlükle gizlemiş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$

afraid-NML-3SG.POSS-ACC hardly hide-PST-1SG

ama kim-den$_{\text{remnant}}$ maalesef bilmiyorum.

but who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly hidden that he is afraid of someone from the boss, but unfortunately I don't know who.'

d. Embd, LowMorph, Recent:

Serkan [patron-a$_{\text{distractor_NP}}$ [birin-den$_{\text{correlate}}$

Serkan boss-ACC someone-ABL

korktuğunu$_{\text{target_verb}}$]$_{\text{target\_TP}}$ güçlükle söylemiş$_{\text{distractor_verb}}$]$_{\text{distractor\_TP}}$

afraid-NML-3SG.POSS-ACC hardly tell-PST-1SG

ama kim-den$_{\text{remnant}}$ maalesef bilmiyorum.

but who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly said that he is afraid of someone from the boss, but unfortunately I don't know who.'

e. Unembd, HighMorph, Distant:

Serkan [birin-den$_{correlate}$ [patron-dan$_{distractor_NP}$

Serkan someone-ABL boss-ABL

korktuğunu$_{distractor_verb}$]$_{distractor\_TP}$ güçlükle gizlemiş$_{target_verb}$]$_{target\_TP}$

afraid-NML-3SG.POSS-ACC hardly hide-PST-1SG

ama kim-den$_{remnant}$ maalesef bilmiyorum.

but who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly hidden that he is afraid of someone from the boss, but unfortunately I don't know who.'

f. Unembd, LowMorph, Distant:

Serkan [birin-den$_{correlate}$ [patron-a$_{distractor_NP}$

Serkan someone-ABL boss-ACC

kızdığını$_{distractor_verb}$]$_{distractor\_TP}$ güçlükle gizlemiş$_{target_verb}$]$_{target\_TP}$

angry-NMLZ-3SG.POSS-ACC hardly hide-PST-1SG

ama kim-den$_{remnant}$ maalesef bilmiyorum.

but who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly hidden that he is angry with someone from the boss, but unfortunately I don't know who.'

g. Unembd, HighMorph, Recent:

Serkan [[patron-dan$_{distractor_NP}$ korktuğunu$_{distractor_verb}$]$_{distractor\_TP}$

Serkan boss-ABL afraid-NMLZ-3SG.POSS-ACC

birin-den$_{correlate}$ güçlükle gizlemiş$_{target_verb}$]$_{target\_TP}$ ama

someone-ABL hardly hide-PST-1SG but

kim-den$_{remnant}$ maalesef bilmiyorum.

who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly hidden that he is afraid of someone from the boss, but unfortunately I don't know who.'

h. Unembd, LowMorph, Recent:

Serkan [[patron-a$_{distractor_NP}$ kızdığını$_{distractor_verb}$]$_{distractor\_TP}$

Serkan boss-ACC angry-NMLZ-3SG.POSS-ACC

birin-den$_{correlate}$ güçlükle gizlemiş$_{target_verb}$]$_{target\_TP}$ ama

someone-ABL hardly hide-PST-1SG but

kim-den$_{remnant}$ maalesef bilmiyorum.

who-ABL unfortunately know-NEG-PROG-1SG

'Serkan has hardly hidden that he is angry with someone from the boss, but unfortunately I don't know who.'

The sluiced clause always included an animate object *wh*-remnant *kim* "who" with an accusative, ablative, or dative case.

Twenty-four sentence sets were created, each with the eight versions as in (2a-h). There were 192 experimental sentences in total (see Appendix D for the full list of experimental stimuli). Each sentence set was distributed across eight lists counterbalancing for Syntactic Distance (Embd, Unembd), Morphological Similarity (HighMorph, LowMorph), and Linear Distance (distant, recent). In each list, there

were 24 experimental, 72 filler, and five practice sentences, totaling up to 99 sentences. Twenty-four of the filler sentences were the experimental sentences of Experiment 1 (see Section 4.1) which had sluicing dependencies with also two potential antecedent sites, which were coordinated instead of being subordinated to one another. The remaining filler sentences were the same as the filler sentences used in Experiment 1, consisting of sentences including interrogative clauses half with and half without sluicing, similar in length and complexity. Each sentence, including the filler sentences, was followed by a matching *yes*/*no* comprehension question to ensure attention. Half of the comprehension questions required a *yes* response, and the remaining half required a *no* response regarding the truth value of the statements in the experimental sentences.

4.2.3 Predictions

The aim of Experiment 2 was to investigate the effects of similarity-based interference from morphological cues and the effect of syntactic distance on antecedent retrieval and cue-weighting during the processing of sluicing dependencies in Turkish.

In Experiment 1, the results demonstrated that semantically similar distractors consistently made processing more difficult, while morphologically similar distractors facilitated processing in contexts where the distractor gets higher activation than the target. The results also showed that linear distance significantly influenced the online processing of sluicing, with more difficulty observed for linearly distant antecedents. Additionally, the interference effect was stronger when the target antecedent was distant, suggesting that linear distance played a key role in cue-based retrieval. The aim of Experiment 2 was to investigate whether syntactic

distance similarly affects antecedent retrieval, as previous studies suggest that syntactic structure can modulate retrieval processes (Gibson, 1998; 2000; Staub, 2010; Bock & Cutting, 1992; Solomon & Pearlmutter, 2004; Franck et al., 2002; Frazier & Fodor, 1978; Frazier, 1987).

In Experiment 2, while the semantic similarity of the distractor NP was held constant across conditions, the morphological similarity (HighMorph vs. LowMorph) was manipulated. If morphological case similarity affects sluicing processing in Turkish as would be predicted by the cue-based retrieval model, the presence of a distractor sharing both semantic and morphological features with the remnant is predicted to cause higher similarity-based interference than a distractor sharing only semantic features with the remnant. If case similarity causes inhibitory interference as observed for grammatical sentences in earlier research on Japanese (Uehara & Bradley, 1986) and Turkish (Bakay, 2020; Bakay & Deniz, 2021), this would be reflected as longer fixation durations on or higher probability of regressions out of the retrieval site (e.g., *kimden* "who-ABL" in (2a)), and longer fixation durations on the target words (e.g., *birinden* "someone-ABL" and *korktuğunu* "afraid" in (2a)) when the distractor NP patrondan "boss-ABL" as in (2a) shared both case and animacy features with the target NP *birinden* "someone-ABL" as in (2a). That is, the reading times on the target words (e.g., *birinden* "someone-ABL" and *korktuğunu* "afraid" in (2a)) and the reading times and regressions out of the retrieval site (e.g., *kimden* "who-ABL" in (2a)) are predicted to be longer/higher in the HighMorph conditions such as (2a, c, e, g) as compared to the HighSem conditions such as (2b, d, f, h).

On the other hand, if case similarity causes facilitatory interference as observed for grammatical sentences in earlier research for English subject-verb

dependencies (e.g., Deniz et al., 2023), and as observed in Experiment 1 for the distant conditions in the sluicing sentences with coordinated antecedents, this would be reflected as shorter fixation durations on or lower probability of regressions out of the retrieval site (e.g., *kimden* "who-ABL" in (2a)), and shorter fixation durations on the target words (e.g., *birinden* "someone-ABL" and korktuğunu "afraid" in (2a)) when the distractor NP *patrondan* "boss-ABL" as in (2a) shared both case and animacy features with the target NP *birinden* "someone-ABL" as in (2a). That is, the reading times on the target words (e.g., *birinden* "someone-ABL" and korktuğunu "afraid" in (2a)) and the reading times and regressions out of the retrieval site (e.g., *kimden* "who-ABL" in (2a)) are predicted to be shorter/lower in the HighMorph conditions such as (2a, c, e, g) as compared to the LowMorph conditions such as (2b, d, f, h).

In Experiment 2, the syntactic distance of the target and distractor antecedents to the retrieval site was manipulated to investigate how syntactic distance impacts antecedent retrieval, with linear distance controlled as a separate factor. The cue-based retrieval model introduced by Lewis and Vasishth (2005) explains retrieval as a content-addressable process, relying on features such as semantic, morphological, and syntactic cues (e.g., animacy, gender, case, agreement) to guide memory access. In this model, hierarchical positions, such as c-command or syntactic embedding, do not inherently influence retrieval unless explicitly encoded as cues. In contrast, some accounts argue that hierarchical structure can affect the processing of linguistic dependencies (e.g., Gibson, 1998; 2000; Staub, 2010; Bock & Cutting, 1992; Solomon & Pearlmutter, 2004; Franck et al., 2002; Frazier & Fodor, 1978; Frazier, 1987). For instance, dependency locality theory (DLT) proposed by Gibson (2000) offers a capacity-based perspective, emphasizing the

cognitive costs associated with processing syntactic structures. DLT posits that unresolved dependencies impose a memory cost when they span intervening material and that integrating distant elements incurs an additional integration cost. These combined costs increase with both syntactic depth and linear distance, making sentences with embedding or long-distance dependencies particularly challenging to process. According to DLT, embedding should amplify the difficulty of antecedent retrieval due to the heightened cognitive load required to maintain and integrate dependencies across greater syntactic distances. If retrieval of a target is influenced by syntactic depth, the syntactically more distant (embedded) targets would be expected to be harder to retrieve. Thus, the processing would be slower when the target was in a syntactically distant position as in (2a, b, c, d) as compared to when it was in a syntactically closer position as in (2e, f, g, h). Additionally, interference would be the strongest when the target was in a syntactically distant, embedded position and the distractor was in a syntactically closer, unembedded position as in (2a, b, c, d). Conversely, interference would be lower when the target was in a syntactically closer, unembedded position and the distractor was in a syntactically distant, embedded position as in (2e, f, g, h).

Note that the manipulation of syntactic distance relied on antecedents with distinct argument structures. One antecedent was a transitive verb with a single direct object (e.g., *birinden korktuğunu* "afraid of someone" as in 2a), while the other was a ditransitive verb with two direct objects, including a clausal complement (e.g., *birinden korktuğunu patrondan gizlemiş* "hidden that he is afraid of someone" as in 2a). The embedded (syntactically distant) antecedent served as an argument within the unembedded (syntactically recent) antecedent, featuring a simpler structure with fewer lexical items. In contrast, the unembedded antecedent incorporated the

embedded clause, resulting in a more complex structure with additional dependencies. This complexity likely increased cognitive demands in unembedded conditions (2e-h) compared to embedded conditions (2a-d), as maintaining and resolving a more elaborate syntactic structure may have taxed memory resources, potentially leading to greater processing difficulty.

Note also that to maintain a word order closer to canonical Turkish syntax, the study manipulated the linear distance of the correlate while keeping the verb distances unchanged, resulting in target verbs being linearly recent in unembedded conditions and linearly distant in embedded conditions. This introduced variations across linearly distant (2a, b, e, f) and linearly recent (2c, d, g, h) conditions, particularly within syntactically distant (Embd; 2c, d) and syntactically closer (Unembd; 2e, f) contexts. For example, in syntactically closer but linearly distant conditions (Unembd, distant; 2e, f), the correlate and target verb were non-adjacent, while in syntactically distant but linearly recent conditions (Embd, recent; 2c, d), the distractor NP and verb were non-adjacent. This lack of adjacency likely increased cognitive demands in unembedded distant (2e, f) and embedded recent (2c, d) conditions, as participants had to maintain an additional dependency (e.g., between the main verb like *gizlemiş* "hidden" and its embedded object clause *patrona kızdığını* "that he is angry with the boss"). These conditions likely led to increased processing difficulty, as resolving both dependencies simultaneously posed additional memory challenges.

4.2.4 Procedure

The procedure was the same as in Experiment 1.

4.2.5 Data analysis

The procedure for data analysis was the same as in Experiment 1.

4.2.6 Results

The data inclusion criterion was 80% accuracy for the comprehension questions. Three participants were excluded from the analyses because their accuracy was below 80%. Three other participants were also excluded because of multiple numbers of track losses during the eye recording—two due to interrupted experimental sessions, and one due to hand-intrusion during eye-movement recording. Statistical analyses were conducted on the remaining participants (N = 84).

Linear mixed-effects regression models were used to analyze reading times, while linear mixed-effects logistic regression models were employed for analyzing regression-out probabilities. Experiment 2 manipulated three variables: Syntactic Distance (Embd, Unembd), Morphological Similarity (LowMorph, HighMorph), and Linear Distance (distant, recent). The primary focus was on Syntactic Distance and Morphological Similarity, as they were central to the research questions in Experiment 2. Linear Distance was controlled to prevent it from acting as a confounding variable, particularly due to the manipulation of Syntactic Distance between the potential target and distractor antecedent sites. Consequently, the statistical models included fixed effects for Syntactic Distance (Embd, Unembd) and Morphological Similarity (HighMorph, LowMorph) as independent variables, and Linear Distance (distant, recent) as a control variable. By including Linear Distance as a control variable, its effects were accounted for, allowing for a clearer interpretation of the impacts of Syntactic Distance and Morphological Similarity on

antecedent retrieval. The trial number was also included in the main analyses as a control variable for the trial-by-trial sequence effects such as fatigue and familiarization (Baayen, 2008). The random effects structure consisted of by-participant and by-item intercepts. All categorical predictors of the models were treatment-coded by default. For Syntactic Distance, the Unembd condition was taken as the baseline, and the Embd condition was compared to the Unembd condition. For Morphological Similarity, the LowMorph condition was taken as the baseline, and the HighMorph condition was compared to the LowMorph condition. For Linear Distance, the recent condition was taken as the baseline, and the distant condition was compared to the recent condition. The trial number was centered and scaled (i.e., *z*-scores) to reduce multicollinearity among predictors. Although Linear Distance was statistically controlled in all statistical models, the results section will primarily report and interpret findings for Syntactic Distance and Morphological Similarity to maintain the focus on the study's main hypotheses.

The steps for model building followed the same procedure as in Experiment 1. As an initial trimming for the outliers, the data utilized in the reported models were filtered to exclude any data points with standardized residuals exceeding 2.5 standard errors, as suggested by Baayen and Milin (2010). In the model criticism stage, any participants, items, and individual data points that were overly influential were detected and removed from these models based on Cook's Distance measure using the *influence.ME* package (Nieuwenhuis et al., 2012). The findings are presented separately for each critical region in the sections below. When complex models involving combinations or interactions of the two predictors were found to be significant, bar plots with error bars were included in the figures to facilitate the interpretation of the results.

The effect of trial number on eye-tracking measures was examined before the main analyses. At the remnant region, FFD and GD increased over time (β's $\geq$ .02, t's $\geq$ 2.94, p's $\leq$ .001). At the remnant's spill-over region, FFD, GD, RPD, and PRO increased (β's $\geq$ .01, t's $\geq$ 1.93, p's $\leq$ .05; PRO: z = 2.03, p = .04), while at the correlate region, RRD, TD and PRI decreased (β's $\leq$ -.03, $t \leq$ -2.09, p's $\leq$ .04; PRI: z = -4.49, p < .001). This pattern of decreasing durations was consistent for RRD, TD, and PRI at the target verb (β's $\leq$ -.03, t's $\leq$ -2.06, p's $\leq$ .001; PRI: z = -2.50, p = .01), distractor NP (β's $\leq$ -.01, t's $\leq$ -4.08, p's $\leq$ .001; PRI: z = -3.89, p < .001), and distractor verb (β's $\leq$ -.06, t's $\leq$ -5.25, p's $\leq$ .001; PRI: z = -1.83, p = .07) regions. Consequently, the trial number was included as a predictor in all statistical models for FFD and GD at the remnant; FFD, GD, RPD, TD, and PRO at the remnant's spill-over region; and RRD, TD, and PRI at the correlate, target verb, distractor NP, and distractor verb regions in subsequent analyses.

The effect of the Linear Distance of the correlate was also examined across all critical regions before the main analyses. Linear Distance of the correlate increased RRD, TD, and PRI at the correlate (β's $\geq$ .10, t's $\geq$ 4.14, p's $\leq$ .001; PRI: z = 14.11, p < .001) and the target verb regions (β's $\geq$ .06, t's $\geq$ 2.90, p's $\leq$ .004; PRI: z = 7.70, p < .001), while it decreased RRD, TD, and PRI at the distractor NP (β's $\leq$ -.17, t's $\leq$ -8.11, p's $\leq$ .001; PRI: z = -14.70, p < .001), and TD and PRI at the distractor verb regions (β = -.04, t = -1.90, p's = .06; PRI: z = -4.94, p < .001). Consequently, Linear Distance was included as a predictor in all statistical models for RRD, TD, and PRI at the correlate, target verb, and distractor NP regions, as well as for TD and PRI at the distractor verb region.

4.2.6.1 The remnant

Table 15 below presents the mean and standard error values for the remnant region, for the eight conditions and the six eye-tracking measures.

Table 15. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Remnant Region for Experiment 2

	FFD	GD	RPD	RRD	TD	PRO
Embd, Distant, HighMorph	225 (6.29)	243 (7.47)	331 (24.28)	369 (28.10)	436 (21.11)	.11 (.02)
Embd, Distant, LowMorph	236 (6.97)	261 (8.62)	326 (28.31)	403 (29.10)	482 (23.59)	.07 (.02)
Embd, Recent, HighMorph	219 (4.79)	238 (9.05)	333 (47.58)	448 (33.80)	482 (28.08)	.07 (.02)
Embd, Recent, LowMorph	218 (5.02)	233 (6.51)	311 (36.34)	469 (41.26)	481 (29.64)	.07 (.02)
Unembd, Distant, HighMorph	219 (5.49)	229 (6.23)	349 (43.36)	356 (27.96)	405 (20.35)	.08 (.02)
Unembd, Distant, LowMorph	234 (5.56)	247 (7.08)	315 (32.21)	385 (32.19)	419 (21.14)	.06 (.02)
Unembd, Recent, HighMorph	218 (5.82)	239 (8.04)	372 (36.72)	378 (30.76)	411 (21.44)	.11 (.02)
Unembd, Recent, LowMorph	230 (6.15)	247 (8.44)	362 (33.03)	360 (23.95)	432 (20.59)	.14 (.03)

For GD, the model with Morphological Similarity as the only predictor provided a better fit to the data (χ^2 (1) = 4.36, p = .04), revealing that participants read the remnant significantly faster in the HighMorph condition as compared to the LowMorph condition (β = -.03, SE = .02, t = -1.98, p = .05). However, there was no significant effect of Syntactic Depth on RRD at the remnant (β = .01, SE = .02, t = .77, p = .44).

For RRD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 5.30, p = .02), revealing that participants fixated longer on the remnant significantly when the antecedent was syntactically distant (Embd) as compared to when it was syntactically closer to the remnant (Unembd) (β = .11, SE =

.04, t = 2.54, p = .01). However, there was no significant effect of Morphological Similarity on RRD at the remnant (β = -.01, SE = .04, t = -.12, p = .90).

For TD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 8.29, p = .004), revealing that participants spent longer time on the remnant when the antecedent was syntactically distant (Embd) as compared to when it was syntactically closer (Unembd) to the remnant (β = .08, SE = .03, t = 3.27, p = .001). However, there was no effect of Morphological Similarity on TD at the remnant (β = -.03, SE = .03, t = -1.19, p = .24).

For FFD, RPD and PRO, there was no effect of Syntactic Distance (t's ≤ 1.29, p's ≥ .20; PRO: z = .06, p = .95) or Morphological Similarity (t's ≤ 1.29, p's ≥ .17; PRO: z = -.63, p = .53). For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including two participants and 55 data points for GD, three participants, one item, and 12 data points for RRD, and 22 data points for TD.

4.2.6.2 The remnant's spill-over region

Table 16 below presents the mean and standard error values for the remnant's spill-over region, for the eight conditions and the six eye-tracking measures.

Table 16. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Remnant's Spill-over Region for Experiment 2

	FFD	GD	RPD	RRD	TD	PRO
Embd, Distant, HighMorph	238 (5.74)	282 (8.68)	760 (74.18)	422 (25.05)	541 (22.32)	.28 (.03)
Embd, Distant, LowMorph	235 (5.82)	277 (8.80)	786 (91.22)	465 (29.11)	561 (26.59)	.28 (.03)
Embd, Recent, HighMorph	235 (5.64)	299 (11.59)	869 (98.63)	517 (26.95)	634 (27.80)	.27 (.03)
Embd, Recent, LowMorph	248 (6.67)	318 (12.82)	817 (75.49)	469 (34.42)	596 (28.03)	.27 (.03)
Unembd, Distant, HighMorph	234 (5.12)	282 (9.22)	795 (147.97)	489 (34.62)	543 (26.91)	.22 (.03)
Unembd, Distant, LowMorph	243 (5.86)	296 (9.42)	860 (91.77)	457 (28.29)	536 (23.69)	.32 (.03)
Unembd, Recent, HighMorph	242 (5.58)	306 (10.94)	670 (59.04)	434 (23.76)	553 (22.94)	.23 (.03)
Unembd, Recent, LowMorph	238 (5.18)	300 (9.23)	690 (59.69)	412 (23.65)	531 (21.02)	.29 (.03)

The analyses showed a significant interaction of Syntactic Distance and Morphological Similarity in RPD. That is, the complex model including the interaction of Syntactic Distance and Morphological Similarity explained the data better than the simpler model without interaction (χ^2 (3) = 4.07, p = .04). Figure 14 below summarizes the data for RPD.

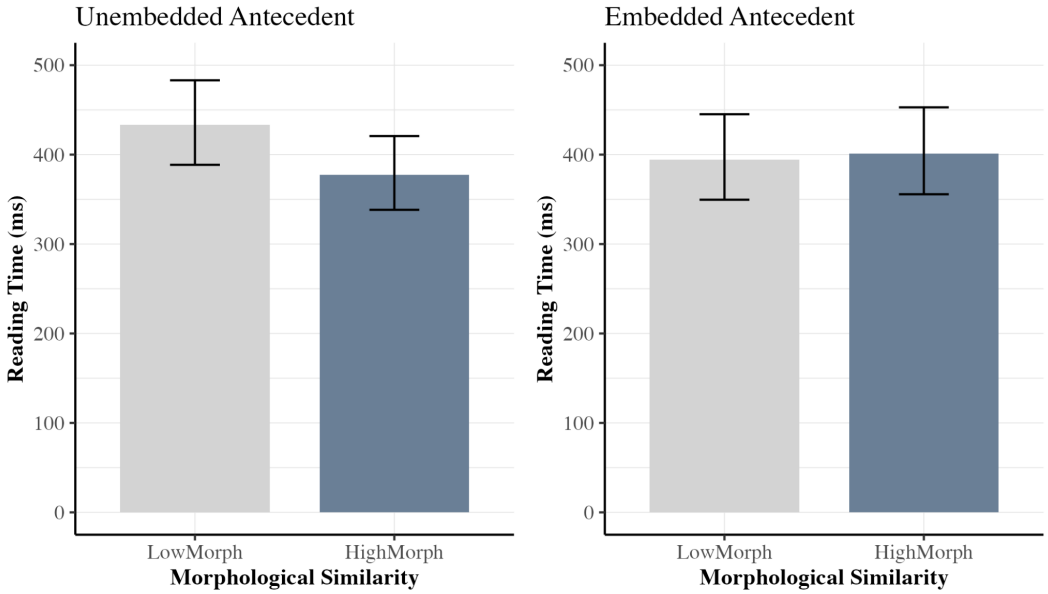

Figure 14. The effect of Morphological Similarity on RPD by Syntactic Distance at the remnant's spill-over region for Experiment 2

Results of the complex model for RPD revealed a significant interaction of Morphological Similarity and Syntactic Distance (β = .13, *SE* = .07, *t* = 1.99, *p* = .05). To more clearly assess the individual contributions of Morphological Similarity and Syntactic Depth predictors, the effect of Morphological Similarity was examined separately in the Embd and Unembd conditions. In the Embd condition, there was no significant difference between the LowMorph and HighMorph conditions (β = -.01, *SE* = .05, *t* = -.16 *p* = .87). In the Unembd condition, however, the HighMorph condition was read significantly faster than the LowMorph condition (β = -.14, *SE* = .05, *t* = -2.99 *p* = .003).

The analyses showed a significant interaction of Syntactic Distance and Morphological Similarity in PRO. That is, the complex model including the interaction of Morphological Similarity and Syntactic Distance explained the data better than the simpler model without interaction (χ^2 (3) = 6.46, *p* = .01). Figure 15 below summarizes the data for PRO.

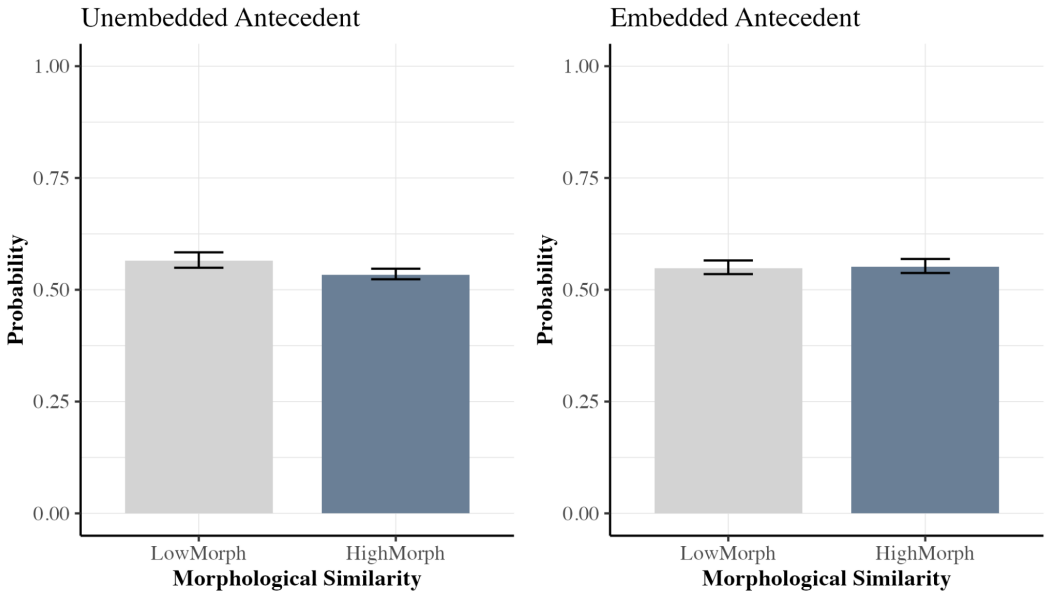

Figure 15. The effect of Morphological Similarity on PRO by Syntactic Distance at the remnant's spill-over region for Experiment 2

Results of the complex model for PRO revealed a significant interaction of Morphological Similarity and Syntactic Distance (β = .97, *SE* = .25, z = 3.93, p < .001). To more clearly assess the individual contributions of Morphological Similarity and Syntactic Depth predictors, the effect of Morphological Similarity was examined separately in the Embd and Unembd conditions. In the Embd condition, there was no significant difference between the LowMorph and HighMorph conditions (β = .07, *SE* = .17, z = .43 p = .67). In the Unembd condition, however, the HighMorph condition resulted in significantly fewer regressions out of the spill-over region compared to the LowMorph condition (β = -.82, *SE* = .18, z = -4.65 p < .001).

For FFD, GD, RRD, and TD, there was no effect of Syntactic Distance (t's ≤ 1.34, p's ≥ .18) or Morphological Similarity (t's ≤ 1.58, p's ≥ .11). For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including 2 participants and 87 data points in RPD, and 55 data points in PRO.

4.2.6.3 The correlate

Table 17 below presents the mean and standard error values for the correlate region, for the eight conditions and the six eye-tracking measures.

Table 17. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Correlate Region for Experiment 2

	FFD	GD	RPD	RRD	TD	PRI
Embd, Distant, HighMorph	217 (4.46)	288 (8.71)	364 (16.74)	643 (32.77)	842 (34.84)	.68 (.03)
Embd, Distant, LowMorph	223 (5.15)	303 (10.43)	369 (13.14)	699 (36.49)	912 (38.99)	.73 (.03)
Embd, Recent, HighMorph	247 (5.70)	286 (8.37)	391 (22.80)	607 (32.14)	791 (32.14)	.39 (.03)
Embd, Recent, LowMorph	245 (5.02)	301 (8.53)	393 (19.68)	611 (36.65)	774 (34.03)	.40 (.03)
Unembd, Distant, HighMorph	221 (5.32)	304 (12.41)	398 (17.45)	706 (38.69)	897 (39.52)	.72 (.03)
Unembd, Distant, LowMorph	226 (5.87)	285 (10.01)	378 (15.61)	613 (33.02)	797 (34.91)	.69 (.03)
Unembd, Recent, HighMorph	256 (6.83)	311 (10.15)	423 (18.08)	631 (32.74)	809 (33.27)	.48 (.03)
Unembd, Recent, LowMorph	255 (6.46)	303 (9.53)	484 (25.45)	570 (35.98)	764 (34.39)	.38 (.03)

The analyses showed a significant interaction of Syntactic Distance and Morphological Similarity in RRD. That is, the complex model including the interaction of Syntactic Distance and Morphological Similarity explained the data significantly better than the simpler model without interaction (χ^2 (3) = 5.58, p = .02). Figure 16 below summarizes the data for RRD.

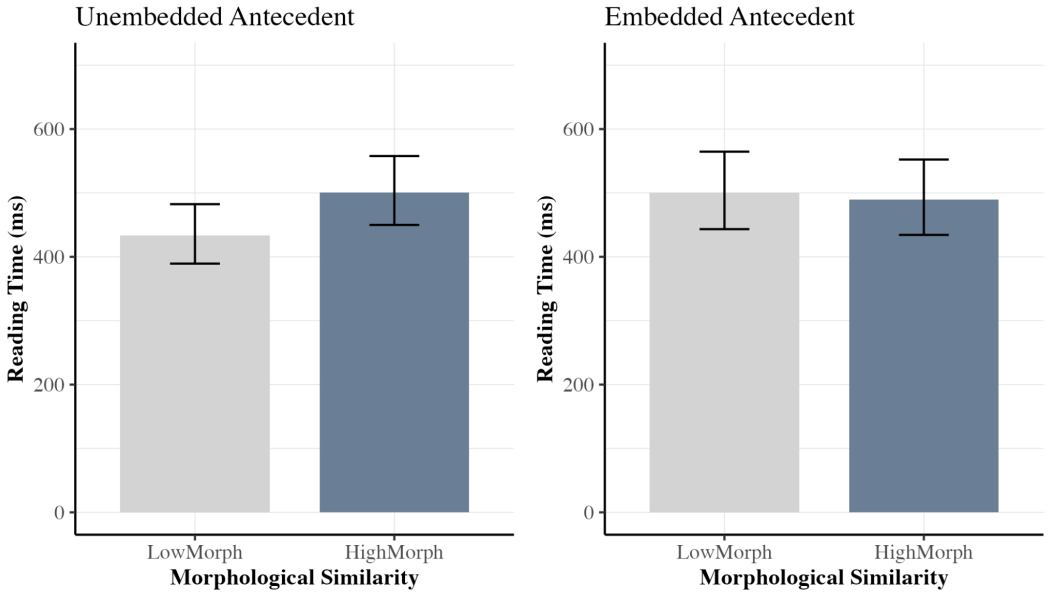

Figure 16. The effect of Morphological Similarity on RRD by Syntactic Distance at the correlate region for Experiment 2

Results of the complex model for RRD revealed a significant main effect of Syntactic Distance, with embedded antecedents leading to significantly longer reading times compared to matrix antecedents (β = .15, *SE* = .04, *t* = 3.47, *p* < .001); and a significant main effect of Morphological Similarity, with HighMorph condition leading to longer reading times compared to LowMorph condition (β = .15, *SE* = .04, *t* = 3.37, *p* < .001). Examining the effect of Morphological Similarity separately in the Embd and Unembd conditions showed that, in the Embd condition, there was no significant difference between the LowMorph and HighMorph conditions (β = -.06, *SE* = .06, *t* = -.95 *p* = .35). In the Unembd condition, however, reading times for the HighMorph condition was significantly longer than the LowMorph condition (β = .16, *SE* = .06, *t* = 2.63 *p* = .01).

For TD, the model with Morphological Similarity as the only predictor provided a better fit to the data (χ^2 (1) = 4.45, *p* = .04), revealing that participants read the correlate significantly longer in the HighMorph condition as compared to the LowMorph condition (β = .05, *SE* = .02, *t* = 2.02, *p* = .04). However, there was no significant effect of Syntactic Depth on TD at the correlate (β = .01, *SE* = .02, *t* = .25, *p* = .80).

The analyses showed a significant interaction of Syntactic Distance and Morphological Similarity on PRI. That is, the complex model including the interaction of Morphological Similarity and Syntactic Distance explained the data better than the simpler model without interaction (χ^2 (3) = 4.15, *p* = .04). Figure 17 below summarizes the data for PRI.

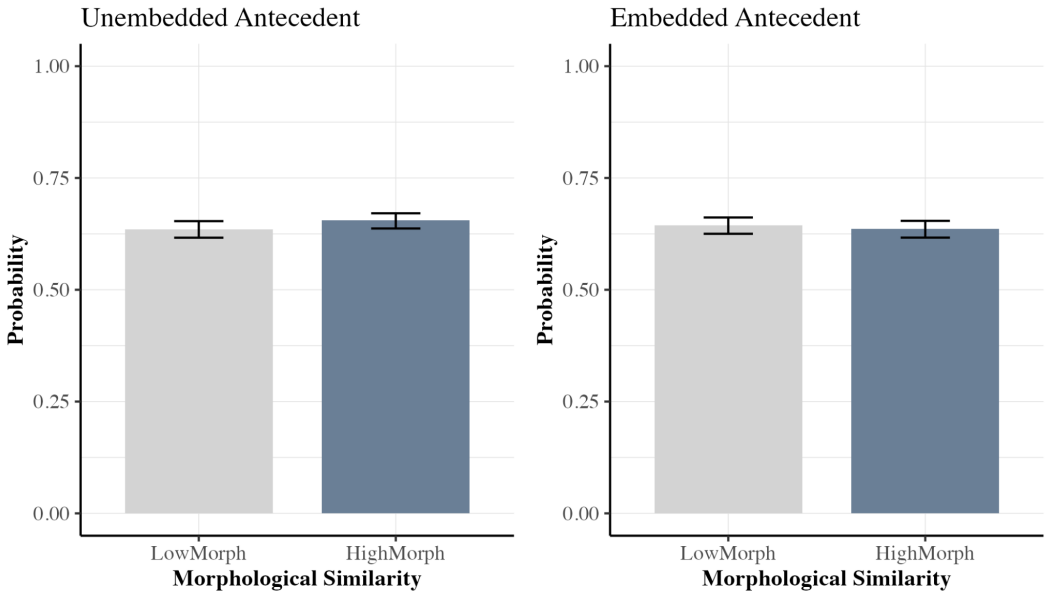

Figure 17. The effect of Morphological Similarity on PRI by Syntactic Distance at the correlate region for Experiment 2

Results of the complex model for PRI revealed a significant interaction of Morphological Similarity and Syntactic Distance (β = -.51, *SE* = .23, *z* = -2.23, *p* = .03). To more clearly assess the individual contributions of Morphological Similarity and Syntactic Depth predictors, the effect of Morphological Similarity was examined separately in the Embd and Unembd conditions. In the Embd condition, there was no significant difference between the LowMorph and HighMorph conditions (β = -.15, *SE* = .17, *z* = -.88 *p* = .38). In the Unembd condition, however, the HighMorph condition resulted in significantly more regressions into the correlate region compared to the LowMorph condition (β = .36, *SE* = .16, *z* = 2.21 *p* = .03).

For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including one item and 41 data points in RRD, one participant and 56 data points in TD, and 28 data points in PRI.

4.2.6.4 Target verb

Table 18 below presents the mean and standard error values for the target region, for the eight conditions and the six eye-tracking measures.

Table 18. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Target Verb Region for Experiment 2

	FFD	GD	RPD	RRD	TD	PRI
Embd, Distant, HighMorph	234 (4.53)	332 (9.74)	420 (16.52)	768 (35.36)	980 (34.62)	.58 (.03)
Embd, Distant, LowMorph	243 (5.37)	383 (12.62)	448 (17.17)	837 (42.39)	1111 (42.57)	.60 (.03)
Embd, Recent, HighMorph	251 (5.33)	326 (9.79)	498 (27.57)	645 (33.26)	840 (32.57)	.28 (.03)
Embd, Recent, LowMorph	253 (5.82)	355 (11.71)	474 (22.21)	675 (38.14)	889 (36.16)	.37 (.03)
Unembd, Distant, HighMorph	250 (5.45)	297 (8.69)	560 (33.24)	477 (35.09)	600 (28.50)	.17 (.02)
Unembd, Distant, LowMorph	258 (6.78)	304 (9.48)	591 (41.22)	437 (27.63)	570 (23.44)	.15 (.02)
Unembd, Recent, HighMorph	261 (6.53)	311 (9.56)	598 (44.91)	543 (32.58)	664 (29.08)	.12 (.02)
Unembd, Recent, LowMorph	260 (6.14)	327 (9.56)	535 (34.58)	514 (36.67)	645 (28.94)	.14 (.02)

For RRD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 8.68, p = .003), revealing that participants read the target verb significantly longer when the antecedent was syntactically distant (Embd) as compared to when it was syntactically closer to the remnant (Unembd) (β = .46, SE = .03, t = 14.45, p < .001). However, there was no significant effect of Morphological Similarity on RRD at the target verb (β = -.03, SE = .03, t = -.07, p = .94).

The analyses showed a significant interaction of Syntactic Distance and Morphological Similarity in TD. That is, the complex model including the interaction of Syntactic Distance and Morphological Similarity explained the data

significantly better than the simpler model without interaction (χ^2 (3) = 4.43, p = .04). Figure 18 below summarizes the data for TD.

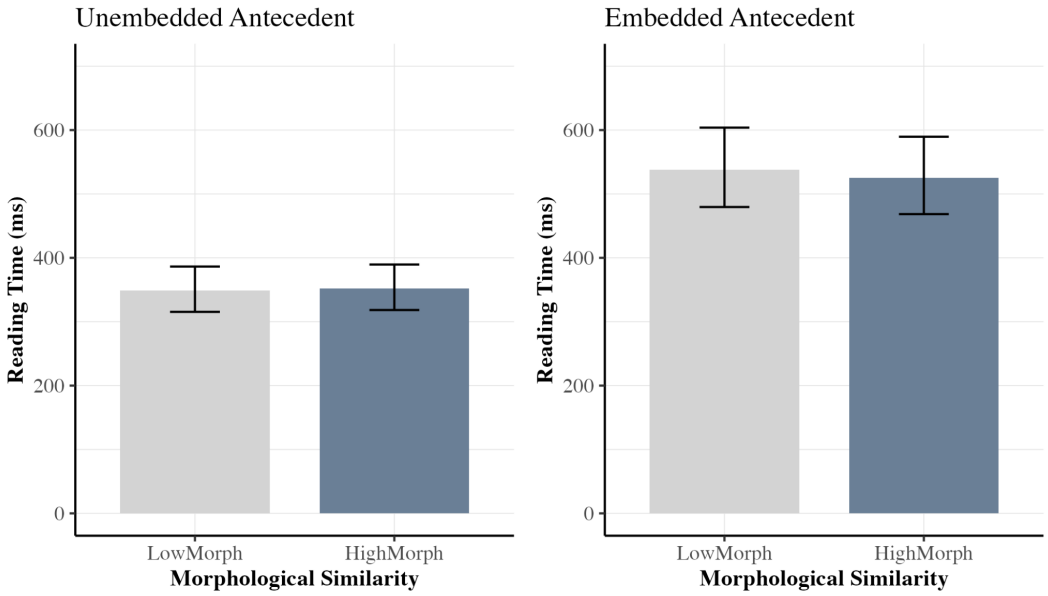

Figure 18. The effect of Morphological Similarity on TD by Syntactic Distance at the target verb region for Experiment 2

Results of the complex model for TD revealed a significant main effect of Syntactic Distance (β = .50, SE = .03, t = 16.64, p < .001), revealing that participants read the target verb significantly longer when the antecedent was syntactically distant (Embd) as compared to when it was syntactically closer to the remnant (Unembd). However, there was no significant main effect of Morphological Similarity (β = .02, SE = .03, t = .52, p = .60). Examining the effect of Morphological Similarity separately in the Embd and Unembd conditions again showed that, reading times did not differ between the LowMorph and HighMorph conditions both in the Embd (β = -.02, SE = .04, t = -.54, p = .59) and Unembd conditions (β = .01, SE = .05, t = .18, p = .85).

For PRI, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 239.18, p < .001), revealing that participants made significantly more regressions into the target verb region when the antecedent was

syntactically distant (Embd) as compared to when it was syntactically closer to the remnant (Unembd) (β = 1.86, *SE* = .13, *t* = 14.36, *p* < .001). However, there was no significant effect of Morphological Similarity on PRI at the target verb (β = -.14, *SE* = .11, *z* = -1.27, *p* = .21).

For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including one participant 30 data points in RRD, 58 data points in TD, and two participants and 90 data points in PRI.

4.2.6.5 Distractor NP

Table 19 below presents the mean and standard error values for the distractor NP region, for the eight conditions and the six eye-tracking measures.

For RRD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 8.68, *p* = .003), revealing that participants read the distractor NP significantly longer when the target antecedent was syntactically distant (Embd) compared to when it was syntactically closer to the remnant (Unembd) (β = .09, *SE* = .03, *t* = 2.97, *p* = .003). However, there was no significant effect of Morphological Similarity on RRD at the distractor NP (β = .02, *SE* = .03, *t* = .53, *p* = .60).

Table 19. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Distractor NP Region for Experiment 2

	FFD	GD	RPD	RRD	TD	PRI
Embd, Distant, HighMorph	275 (6.47)	340 (9.91)	441 (21.86)	611 (32.22)	825 (32.47)	.44 (.03)
Embd, Distant, LowMorph	255 (5.73)	344 (10.90)	488 (22.74)	713 (40.17)	927 (39.16)	.38 (.03)
Embd, Recent, HighMorph	234 (5.75)	357 (13.03)	461 (18.83)	821 (39.30)	1099 (42.02)	.78 (.03)
Embd, Recent, LowMorph	231 (5.45)	350 (12.99)	444 (19.27)	831 (48.65)	1067 (49.76)	.74 (.03)
Unembd, Distant, HighMorph	255 (5.81)	332 (10.29)	414 (18.00)	650 (44.14)	868 (40.59)	.41 (.03)
Unembd, Distant, LowMorph	253 (5.47)	322 (9.07)	392 (16.63)	577 (30.94)	776 (29.98)	.45 (.03)
Unembd, Recent, HighMorph	229 (5.85)	344 (12.01)	457 (17.53)	710 (35.89)	948 (37.76)	.78 (.03)
Unembd, Recent, LowMorph	243 (6.51)	353 (11.90)	447 (14.25)	700 (38.33)	960 (39.62)	.71 (.03)

For TD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 8.68, p = .003), revealing that participants read the distractor NP significantly longer when the target antecedent was syntactically distant (Embd) compared to when it was syntactically closer to the remnant (Unembd) (β = .07, SE = .02, t = 3.36, p < .001). However, there was no significant effect of Morphological Similarity on TD at the distractor NP (β = .02, SE = .02, t = 1.14, p = .25).

There were no effects of Syntactic Distance (β = .12, SE = .11, z = 1.02, p = .31) or Morphological Similarity (β = .04, SE = .11, z = .39, p = .70) on PRI. For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including one participant and 40 data points in RRD, and one participant and 56 data points in TD.

4.2.6.6 Distractor verb

Table 20 below presents the mean and standard error values for the distractor verb region, for the eight conditions and the six eye-tracking measures.

Table 20. Mean Values and Standard Errors (in Parentheses) for the Six Eye-Tracking Measures at the Distractor Verb Region for Experiment 2

	FFD	GD	RPD	RRD	TD	PRI
Embd, Distant, HighMorph	262 (6.33)	330 (10.75)	656 (43.64)	506 (27.54)	675 (26.79)	.17 (.02)
Embd, Distant, LowMorph	250 (5.58)	309 (10.02)	606 (40.34)	551 (37.05)	679 (31.92)	.15 (.02)
Embd, Recent, HighMorph	252 (5.71)	296 (9.30)	504 (33.10)	452 (24.41)	602 (22.89)	.12 (.02)
Embd, Recent, LowMorph	262 (6.47)	299 (8.47)	601 (39.71)	506 (33.19)	619 (28.38)	.13 (.02)
Unembd, Distant, HighMorph	254 (5.75)	346 (10.16)	512 (23.48)	652 (56.16)	886 (50.09)	.33 (.03)
Unembd, Distant, LowMorph	257 (5.96)	368 (12.38)	509 (22.15)	713 (40.31)	923 (38.74)	.33 (.03)
Unembd, Recent, HighMorph	251 (5.45)	380 (11.28)	479 (18.40)	719 (34.88)	988 (35.79)	.56 (.03)
Unembd, Recent, LowMorph	243 (5.22)	398 (12.60)	498 (19.31)	833 (49.71)	1126 (48.65)	.56 (.03)

For RRD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 130.58, $p < .001$), revealing that participants read the distractor verb significantly longer in the Unembd condition as compared to the Embd condition (β = -.38, SE = .04, t = -11.05, $p < .001$). That is, the distractor verb was read longer when it was in an embedded distractor TP as compared to when it was in an unembedded distractor TP. However, there was no significant effect of Morphological Similarity on RRD at the distractor verb (β = -.06, SE = .04, t = -1.65, p = .10).

For TD, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 321.31, $p < .001$), revealing that participants read the distractor verb significantly longer in the Unembd condition as compared to the

Embd condition (β = -.45, *SE* = .02, *t* = -19.64, *p* < .001). That is, the distractor verb was read longer when it was in an embedded distractor TP as compared to when it was in an unembedded distractor TP. However, there was no significant effect of Morphological Interference on TD at the distractor verb (β = -.03, *SE* = .03, *t* = -1.12, *p* = .27).

For PRI, the model with Syntactic Distance as the only predictor provided a better fit to the data (χ^2 (1) = 321.31, *p* < .001), revealing that participants made significantly more regressions into the distractor verb region in the Unembd condition as compared to the Embd condition (β = -2.98, *SE* = .19, *z* = -15.88, *p* < .001). That is, the distractor verb was read longer when it was in an embedded distractor TP as compared to when it was in an unembedded distractor TP. However, there was no significant effect of Morphological Interference on TD at the distractor verb (β = -.06, *SE* = .12, *t* = -.56, *p* = .58).

For the reported models, any data points with standardized residuals exceeding 2.5 standard errors and any overly influential data were excluded, including four participants, two items, and 37 data points in RRD, two participants and 48 data points in TD, and one participant and 91 data points in PRI.

4.2.6.7 Summary of the results

The results of Experiment 2 revealed significant effects of Syntactic Distance and Morphological Similarity. The results are summarized below in two groups: findings related to the remnant and its spill-over region where the sluicing dependency is predicted to be resolved, and findings from the target and distractor antecedent sites where the effects of cue-encoding or reanalysis are expected to occur. Table 21

below outlines the observed Morphological Similarity patterns at the remnant and its spill-over region.

Table 21. Data Patterns for the Retrieval Site Regions for Experiment 2. > indicates longer reading time; < indicates shorter reading time; = indicates no significant differences in reading time.

	Unembd Antecedent (Embd Distractor)	Embd Antecedent (Unembd Distractor)
The remnant region:		
GD	HighMorph < LowMorph	HighMorph < LowMorph
The remnant's spill-over region:		
RPD	HighMorph < LowMorph	HighMorph = LowMorph
PRO	HighMorph < LowMorph	HighMorph = LowMorph

The effect of Morphological Similarity at the retrieval site was primarily observed in earlier measures (GD, RPD, PRO). At the remnant, the initial reading time (GD) was shorter in the HighMorph condition compared to the LowMorph condition. In other words, participants were generally faster to read the region in the HighMorph condition. However, in the spill-over region of the remnant, differences emerged across Syntactic Distance conditions. In the spill-over region, RPD was lower, and PRO was fewer in the HighMorph condition compared to the LowMorph condition, but only when the target antecedent was in an unembedded matrix position (i.e., syntactically closer antecedent and syntactically distant distractor). In other words, participants read the spill-over region faster and made fewer regressions out of it when the target antecedent was syntactically less embedded, and the distractor antecedent was more embedded. However, there were no differences in RPD and PRO between the HighMorph and LowMorph conditions when the target antecedent was in an embedded position.

Syntactic Distance had an overall effect on the processing of the retrieval site, with embedded antecedents leading to slowdowns at the remnant in later measures (RRD, TD). That is, participants took significantly longer to read the remnant when the target antecedent was in an embedded clause, making it syntactically distant from the remnant. Table 22 below outlines the observed Morphological Similarity patterns at target and distractor antecedent sites.

Table 22. Data Patterns for the Target and Distractor Regions for Experiment 2. > indicates longer reading time; = indicates no significant differences in reading time.

	Unembd Antecedent (Embd Distractor)	Embd Antecedent (Unembd Distractor)
Target correlate region:		
RRD	HighMorph > LowMorph	HighMorph = LowMorph
TD	HighMorph > LowMorph	HighMorph > LowMorph
PRI	HighMorph > LowMorph	HighMorph = LowMorph
Target verb, distractor NP, and distractor verb regions:		
RRD	HighMorph = LowMorph	HighMorph = LowMorp
TD	HighMorph = LowMorph	HighMorph = LowMorph
PRI	HighMorph = LowMorph	HighMorph = LowMorph

The effect of Morphological Similarity at the potential antecedent sites appeared only in the correlate region (RRD, TD, PRI), with differences observed across Syntactic Distance conditions in RRD and PRI. Specifically, in the Unembd condition, the HighMorph condition resulted in longer RRD, and higher PRI compared to the LowMorph condition. However, there was no significant difference between the HighMorph and LowMorph conditions in the Embd condition. In other words, participants took longer to reread and revisit the correlate in the HighMorph condition when the antecedent was syntactically closer (Unembd). When the

antecedent was syntactically distant (Embd), participants reread and revisited the correlate for similar durations in both LowMorph and HighMorph conditions. Additionally, an overall longer TD was observed in the HighMorph condition, meaning participants read the correlate significantly longer in the HighMorph condition, regardless of the antecedent's syntactic distance to the remnant. No effect of Morphological Similarity was observed at the target verb, distractor NP, and distractor verb regions.

Syntactic Distance had an overall effect on the processing of regions included in the potential antecedent sites, with the correlate, the target verb, and the distractor NP being read overall longer in the Embd condition as compared to the Unembd condition (RRD, TD, PRI). That is, participants took significantly longer to read these regions when the target antecedent was in an embedded clause, making it syntactically distant from the remnant.

4.2.7 Discussion

Experiment 2 investigated the effect of similarity-based interference on the real-time processing of sluicing in Turkish sentences with two potential antecedent sites that were subordinated, examining the role of morphological similarity and syntactic distance using an eye-tracking methodology. There were three main findings. First, syntactically distant antecedents made the processing of sluicing dependencies overall more challenging. Participants spent more time reading the retrieval and target sites when the antecedent was syntactically distant from the remnant, i.e., embedded in a subordinate clause. Second, morphologically similar distractors facilitated the initial processing of sluicing dependencies at the retrieval site, however resulted in longer processing of the target regions. Third, the effect of

morphological similarity specifically emerged when the target antecedent was syntactically closer, i.e., unembedded, and the distractor antecedent was syntactically more distant, i.e., embedded.

The results showed that syntactically distant antecedents, embedded within subordinate clauses, caused more processing difficulty, as seen in longer reading times at both the retrieval site and the antecedent regions. These findings suggest that embedding made the retrieval of antecedents more effortful, even when linear distance was largely controlled for. The findings are in line with the predictions of the previous accounts that argue for the effect of hierarchical structure on linguistic dependency processing (e.g., DLT; Gibson, 1998; 2000; the syntactic distance hypothesis; Bock & Cutting, 1992; Solomon & Pearlmutter, 2004; Franck et al., 2002; garden-path model; Frazier & Fodor, 1978; Frazier, 1987). The results are also in line with previous research on object-relative clauses showing that object-relative clauses are harder to process than subject-relative clauses (e.g., Gibson, 2000; Gordon et al., 2002; Staub, 2010). Object-relative clauses involve deeper structural embedding, creating a filler-gap dependency where the filler is farther from its gap. For instance, in an object-relative clause like *the boy [who the dog saw __] smiled*, the object *the boy* is harder to link to its gap due to the intervening subject *the dog* as compared to a subject-relative clause like *the boy [who __ saw the dog] smiled*. Similarly, Experiment 2 suggests that the processing difficulty of embedded antecedents in sluicing dependencies arises from their greater syntactic distance to the resolution site (the remnant), which imposes a higher memory load and increases cognitive effort during processing.

The results also indicated an effect of morphological similarity. However, this effect was facilitatory in earlier regions and inhibitory in later regions and

emerged mostly when the target antecedent was syntactically closer (unembedded), and the distractor was syntactically distant (embedded). At the remnant, morphological similarity led to speedups at the remnant in earlier measures (GD), regardless of whether the antecedent was syntactically distant (unembedded) or closer to the remnant (embedded). It also resulted in fewer regressions and shorter regression path durations at the spill-over region, particularly when the antecedent was syntactically closer (unembedded). However, when the antecedent was syntactically distant (embedded), morphological similarity had no significant effects.

At the potential antecedent sites, morphological similarity also caused slowdowns, particularly at the correlate region, while morphological dissimilarity had no significant impact on processing or reanalysis. This inhibitory effect of morphological similarity was, again, most pronounced when the target antecedent was syntactically closer (unembedded) and the distractor antecedent was syntactically distant (embedded), leading to increased RRD and PRI at the correlate, suggesting a reanalysis of these regions. In contrast, when the antecedent was syntactically distant (embedded), RRD and PRI were similar across syntactic distance conditions. However, longer TD at the correlate region was observed in the HighMorph condition, regardless of syntactic distance, suggesting that effects of case similarity may arise not only during retrieval but also at the encoding stage, across both distant and recent conditions. Encoding interference occurs when similar features (e.g., case or morphology) create overlap or confusion during the initial storage of items, complicating later retrieval processes.

This facilitatory effect of morphological similarity at the retrieval site suggests that similarity facilitated early-stage processing in sluicing resolution, as evidenced by the speed-up observed at the remnant and its spill-over region in early

measures, consistent with previous research showing similar effects of morphologically similar distractors in English subject-verb dependencies (Wagers et al., 2009; Dillon et al., 2013; Deniz et al., 2023). The results also showed that this facilitation at the retrieval site was stronger when the target antecedent was unembedded and the distractor was embedded, as suggested by the spill-over effect observed only in the Unembd condition. The results also align with Experiment 1, where morphological similarity facilitated early-stage processing at the retrieval site. Similar to Experiment 1, this effect can be interpreted as an initial reliance on morphosyntactic cues in sluicing resolution that facilitates early-stage processing by reducing cognitive demands through partial overlap between the distractor and the probe, making retrieval faster and easier.

Notably, there was also an increased RRD and PRI at the correlate region suggesting that there was also an inhibitory effect that arose in the later stages of processing. This inhibitory effect might reflect an increased cognitive effort to resolve a potential competition arising from cue-matching items, which resulted in increased reanalysis of the target regions. One interpretation could be that this inhibitory effect observed at the correlate region was possibly reflecting an increased need for reanalysis during semantic integration, which was also observed in Experiment 1. In Experiment 1, an inhibitory effect of combined semantic and morphological similarity was observed at target sites, indicating reanalysis of these regions during later stages of semantic integration. In Experiment 2, both the correlate and the distractor NPs shared matching semantic cues (animacy), while morphological case similarity was manipulated between conditions. Thus, the inhibitory effects observed at the correlate region in Experiment 2 might reflect the influence of both semantic and morphological similarity. This finding further

supports the idea that the retrieval system initially relied on morphosyntactic cues, as observed by faster processing at the earlier regions when there was a case-matching distractor. However, in the later stages of processing where semantic cues are integrated, semantic similarity between the target and the distractor caused a reanalysis of the target regions, as evidenced by increased PRI and RRD at these regions. Additionally, the observed slowdown in TD at the correlate across both syntactic distance conditions also suggests that morphological interference arose not only during retrieval but also during encoding. During encoding, the presence of a morphologically similar distractor likely increased the feature overlap between the target and distractor, making it harder to establish distinct representations. This overlap might have also led to stronger interference effects that persist into the retrieval phase, compounding the difficulty of resolving the dependency.

It is also important to note that the effect of morphological similarity, either facilitatory or inhibitory, more heavily emerged when the target antecedent was in a syntactically closer, unembedded position and the distractor antecedent was in a syntactically distant, embedded position. The results showed that syntactic distance resulted in an overall slowdown for embedded antecedents, indicating that participants experienced more difficulty in processing syntactically distant antecedents. In line with this finding, it would be expected to see a greater effect of similarity-based interference for embedded antecedents. However, the effect of morphological similarity was not greater when the antecedent was embedded. This may be related to one of the limitations in Experiment 2. The argument structure of the embedded antecedents was always simpler (transitive), with the object and verb of the embedded clause adjacent to one another, making it less costly to resolve the additional object-verb dependency required during the retrieval and integration of the

correlate as the antecedent of the sluiced clause. In contrast, the unembedded antecedents were in a more complex argument structure (ditransitive), and objects and verbs were not adjacent in half of the unembedded conditions (in distant conditions). The additional object-verb dependency for the ditransitive argument structure and the lack of adjacency could have increased the cost of resolving the verb's dependencies with its objects, creating additional difficulty at the retrieval site. Consequently, unembedded antecedents may have provided a more challenging context for retrieval and integration, leaving them more susceptible to similarity-based interference from morphologically similar distractors. In Experiment 1, the effect of morphological similarity was also more pronounced when the antecedent was linearly distant, introducing a more challenging retrieval context. These findings also align with previous research demonstrating that interference effects become more pronounced in contexts requiring higher cognitive demands (e.g., Bakay, 2020; Bakay & Deniz, 2021).

An alternative interpretation involves the reactivation of the distractor TP at the target verb region in sentences with syntactically distant (unembedded) antecedents. In these sentences, the distractor TP is an argument of the verb in the unembedded antecedent clause. As a result, processing the unembedded verb requires resolving an additional object-verb dependency between the unembedded verb and the embedded antecedent TP (Lewis & Vasishth, 2005). During this resolution, morphological cues from the distractor TP may be reactivated, as predicted by the cue-based memory retrieval model (Lewis & Vasishth, 2005). Therefore, in the syntactically distant conditions (unembedded target), the distractor TP could have received higher activation levels compared to the syntactically recent conditions (embedded target). This heightened activation of the distractor TP may

have, in turn, increased the effect of similarity-based interference from its cue-matching features, thereby explaining the amplified effect of similarity-based interference in syntactically distant conditions.

In summary, the findings of Experiment 2 demonstrated a facilitatory effect of morphological similarity at earlier regions and measures, where case-matching distractors enhanced early-stage processing. This facilitation was most pronounced when the antecedent was syntactically distant (unembedded), and the distractor was syntactically recent (embedded). However, at later stages, morphological similarity led to inhibitory effects, likely with the contribution of semantic similarity, as increased competition and confusion among animacy-matching items necessitated reanalysis during the semantic integration stage and resulted in longer rereading durations and higher numbers of revisiting in the target regions. Notably, the interference effects were modulated by syntactic distance but in the opposite direction than what was predicted, with unembedded antecedents being more susceptible to similarity-based interference. This susceptibility may be due to the higher cognitive demands imposed by processing unembedded antecedents with more complex argument structures and the additional activation the distractor gets at the target verb of the unembedded antecedent.

4.3 Experiment 3: Sentence Completion Task

In Experiments 1 and 2, the participants' real-time processing of sluicing dependencies was investigated using eye-tracking methodology. Experiment 3, by contrast, focused on their final interpretations of sentences similar to those used in the first two experiments to examine if real-time language processing and sentence-final interpretations of sluicing dependencies diverge. Real-time processing is known

to be influenced by working memory limitations (Miller & Chomsky, 1963; Yngve, 1960; Frazier & Fodor, 1978; Just & Carpenter, 1992; Gibson, 1998; 2000) as such they can use heuristics or may prioritize certain cues (e.g., syntax) over others which can lead to differential cue weighting or prioritization (Frazier, 1978; 1987). However, sentence-final interpretations are generally thought to be the result of the integration of all available information, being less constrained by cognitive restrictions such as working memory capacity (Frazier, 1987; Caplan & Waters, 1999), and the weighting of cues in final interpretations may differ from those during online parsing. To investigate these dynamics, a sentence completion task was employed to assess how antecedent distance—both linear and syntactic—influenced Turkish speakers' end-of-sentence preferences for verb completions at the *e*-site following the remnants in globally ambiguous sluicing dependencies. The verb preference is assumed to reflect the participants' inferences about the omitted antecedent in the sluiced clause and is predicted to serve as an indicator of how speakers resolve ambiguity in retrieving the antecedent, guided by factors like distance and structural cues.

The results from Experiments 1 and 2 indicated that resolving a sluicing dependency in Turkish was more challenging when the antecedent was linearly and syntactically distant from the sluiced remnant. Experiment 3 aimed to investigate whether linear or syntactic proximity was treated as more informative in resolving such dependencies in sentence-final judgments. The materials were similar to those in Experiments 1 and 2, except that experimental sentences were globally ambiguous. That is, there were two potential antecedent sites, either of which could serve as the grammatical antecedent for the sluicing dependency as shown in (3) in the Materials Section below. The antecedent sites were presented in either

coordinated or subordinated structures to test the effects of linear and syntactic proximity in antecedent retrieval for the sluiced clauses.

4.3.1 Participants

The participants were the same as those in Experiment 1.

4.3.2 Materials

The experimental sentences consisted of globally ambiguous sluicing dependencies such as those in (3). The TPs that contained the two potential antecedents were linked either with coordination as in (3a) or subordination as in (3b). The NPs in the antecedents were indefinite objects NPs (*bir çalışanı* "a worker" and *bir görevliyi* "an officer" as in (3a)) and shared the same case and animacy features with the remnant so that both NPs could be equally interpreted as correlates making both TPs as equally interpretable as antecedents for the *e*-site. Thus, the verb of either antecedent could be retrieved to complete the *e*-site following the remnant.

The conditions that manipulated linear distance involved coordination as in (3a) and one of the antecedents was linearly closer to the remnant (e.g., *bir çalışanı beğenmiş* "liked a worker") and the other was linearly distant to it (e.g., *bir görevliyi incelemiş* "inspected an officer"). The conditions that manipulated syntactic proximity involved subordination as in (3b) and one of the target verbs (e.g., *göndermiş* "sent") was the main verb of the syntactically less embedded antecedent (e.g., *bir çalışanı [bir görevliyi incelemeye] göndermiş* "sent a worker to inspect an officer") and was linearly closer to the remnant while the other verb (e.g., *incelemeye* "to inspect") was the main verb of the syntactically more embedded antecedent (e.g., *bir görevliyi incelemeye* "to inspect and officer") and was linearly more distant to the

remnant. The *e*-site following the remnant (e.g., *kimi* "who" in (3)) was left blank and was to be filled by one of the verbs of the two antecedent sites (V1: distant, V2: close). The verbs were presented below each experimental sentence as options to complete the sentences. For coordinated antecedents (linear distance condition), V1 referred to the linearly distant verb, while V2 represented the linearly closer verb. For subordinated antecedents (syntactic distance condition), V1 corresponded to the verb that was both linearly and syntactically distant, whereas V2 was the verb that was both linearly and syntactically closer. To control for the effects of focus on potential object NPs in sentences involving syntactic distance manipulation, an adverbial such as *bugün* "today" in (3b) was placed before the embedded object NP to prevent it from bearing sentential focus.

There were 12 experimental sentence sets each with the two versions as in (3). Each sentence set was distributed across two lists counterbalancing for the linear and syntactic proximity of the antecedents (Linear Distance vs. Syntactic Distance). In each list, there were 12 experimental sentences intermingled with 12 filler sentences, totaling up to 24 sentences (see Appendix F for the full list of experimental stimuli). The filler sentences were globally ambiguous constructions including VP ellipsis with two syntactically acceptable antecedent sites. The potential antecedent sites in the filler sentences were also either coordinated or subordinated to match the complexity of the experimental sentences. For both experimental and filler sentences, the options to fill the blank (V1, V2) were counterbalanced in the (a) and (b) options.

(3)

a. Linear Distance:

Cansu [bir çalışanı beğenmiş_V1]_ANTECEDENT_1 ve [bir

Cansu a worker-ACC like-PST-3SG and an

görevliyi incelemiş_V2]_ANTECEDENT_2 fakat kimi_REMNANT

officer-ACC inspect-PST-3SG but who-ACC

_____E-SITE aslında anlamadık.

_____E-SITE actually understand-NEG-PST.1PL

'Cansu liked a worker and inspected an officer, but we actually didn't understand who.'

a. beğenmiş_V1 b. incelemiş_V2

like-PST-3SG inspect-PST-3SG

'liked' 'inspected'

b. Syntactic distance:

Cansu [bir çalışanı bugün [bir görevliyi

Cansu a worker-ACC today an officer-ACC

incelemeye_V1]_ANTECEDENT_1 göndermiş_V2]_ANTECEDENT_2 fakat

inspect-NML-3SG-ACC send-PST-3SG but

kimi_REMNANT _____E-SITE aslında anlamadık.

who-ACC _____E-SITE actually understand-NEG-PST.1PL

'Cansu sent a worker today to inspect an officer, but we actually didn't understand who.'

a. incelemeye_V1 b. göndermiş_V2

inspect-NMLZ-DAT send-PST-3SG

'to inspect' 'sent'

4.3.3 Predictions

Experiment 1 aimed to examine whether linear proximity or syntactic proximity was perceived as more informative in sentence-final judgments for resolving sluicing dependencies in Turkish.

Locality effect is observed in sluicing processing as an increased tendency among language users to associate the remnant of an ellipsis with the closest NP in the antecedent clause, both in online and offline measures (e.g., Frazier & Clifton, 1998; Carlson, 2013; Carlson et al., 2009; Harris, 2015; Harris & Carlson, 2016, among others). For example, Frazier and Clifton (1998) found faster processing for ambiguous sentences with lower object NPs as potential correlates in an eye-tracking experiment and higher preferences for object correlates in an offline sentence completion task. They argued that preference for an object correlate is motivated because objects typically carry the sentential focus, making them more salient and accessible for retrieval. Similarly, Harris (2015) observed a facilitation in the processing of sluicing dependencies with object correlates as compared to subject correlates in an eye-tracking study. However, Harris (2015) argued that the observed facilitation stems from the structural locality of the objects, as the structurally closer correlates ease retrieval, though their findings do not rule out the focus hypothesis of Frazier and Clifton (1998) because objects still carry the sentential focus in their experimental sentences.

Experiment 3 aimed to test if linear or syntactic proximity was a stronger force in resolving the dependency. It is predicted that if the participants rely more heavily on linear proximity, sentences would be more frequently completed with a verb from the linearly closer antecedent. For example, in sentences like (3a), the verb

incelemiş (“inspected”) would be chosen over *beğenmiş* (“liked”). Additionally, if syntactic proximity influences these decisions, the effect would be manifested in preferences for syntactically closer antecedents in sentences like (3b). Specifically, participants would favor completing the dependency with the verb from the matrix clause (*göndermiş* “sent”) over the embedded clause verb (*incelemeye* “to inspect”).

It is also possible for both types of distance to affect antecedent preferences. In that case, the highest completion preferences are expected for verbs associated with syntactically unembedded and linearly close antecedents, such as *incelemiş* (“inspected”) in (3a) and *göndermiş* (“sent”) in (3b). If either linear or syntactic proximity were a stronger force, then verb-completion preferences in (3a) and (3b) would show a clear difference between the linear and syntactic distance conditions. That is if syntactic proximity was a stronger force than linear proximity, the probability of preferring the closer verb (V2) over the more distant verb (V1) would be higher in the syntactic distance condition than it would be in the linear distance condition. However, if linear proximity was a stronger force than syntactic proximity, the probability of preferring the closer verb (V2) over the more distant verb (V1) would be higher in the linear distance condition than it would be in the syntactic distance condition.

Note that the syntactic distance manipulation in (3b) introduced an additional linguistic dependency between the main verb and its embedded object clause. Specifically, the correlate and target verb from the syntactically closer (i.e., unembedded) antecedent TP were not linearly adjacent but were separated by the syntactically distant (i.e., embedded) antecedent TP. This may increase the parser’s computational demands on interpreting the closer verb (V2) to resolve the sluicing dependency in the syntactic distance condition, as it would also require the parser to

maintain the dependency for the closer verb (e.g., *göndermiş* "sent") and its embedded objective clause (e.g., *bir görevliyi incelemeye* "to inspect an officer") while resolving the sluicing dependency. In that case, this would be reflected as decreased preferences for the closer verb in the syntactic distance condition.

4.3.4 Procedure

The experiment was designed using Experiment Builder (SR Research, version 2.5.90). The stimuli appeared on a 21-inch monitor, with a screen resolution of 1920 x 1080 pixels. The sentences were aligned to the left on the screen and were presented in a single line. The sentences were printed in black on a white background in a monospaced font (Courier New, 18 pts). The sentences were presented one by one, and each had a blank to be filled with one of two verbs presented below each sentence. The participants were asked to read the sentences on the screen and choose one of the two verbs to fill in the blank by clicking on the corresponding option. After the mouse click, they saw the next item. The task lasted approximately 5-10 minutes.

4.3.5 Results

All the analyses were conducted using R statistical computing software (R Development Core Team, 2024). A mixed logistic regression analysis was conducted using the *glmer* function from the *lme4* package (version 1.1-35.5; Bates et al., 2015) to examine if the syntactic or linear distance of the antecedent affected the participants' sentence-final preference to resolve the sluicing dependencies in Turkish. Distance (linear vs. syntactic) was the fixed effect subject and items were random effects. Model comparisons with likelihood ratio tests were conducted to

finalize the random effect structure. The most complex random effect structure with by-item and by-participant intercepts and slopes explained the data better than the model excluding the by-item random slope (χ^2 (2) = 9.89, p = .01) and the model excluding the by-participant random slope (χ^2 (2) = 45.00, p < .001). Thus, the final model included random intercepts and slopes for both participants and items. The mean percentages of choosing V1 and V2 for Linear and Syntactic distance conditions are summarized in Table 23 below.

Table 23. Percent Verb Completions for Linear and Syntactic Distance Conditions for Experiment 3.

Distance Condition	% Verb Completions	
	V1	V2
Linear distance	27.7	72.3
Syntactic distance	46.3	53.7

The results showed that, in the Linear Distance condition, participants were more likely to complete the blank at the *e*-site with the linearly closer verb than the linearly distant verb. In the Syntactic Distance condition, participants' preference for the linearly and syntactically closer verb was only slightly higher than their choice for the linearly and syntactically distant verb.

A generalized linear mixed model was used to test whether distance type (Linear Distance vs. Syntactic Distance) predicted verb-completion preferences. A likelihood ratio test comparing a model with distance type to a simpler model without it revealed a significant effect of distance type (χ^2 (1) = 5.01, p = .03). Figure 19 below summarizes the data for the closer verb completions (V2-completions) in Linear Distance and Syntactic Distance conditions.

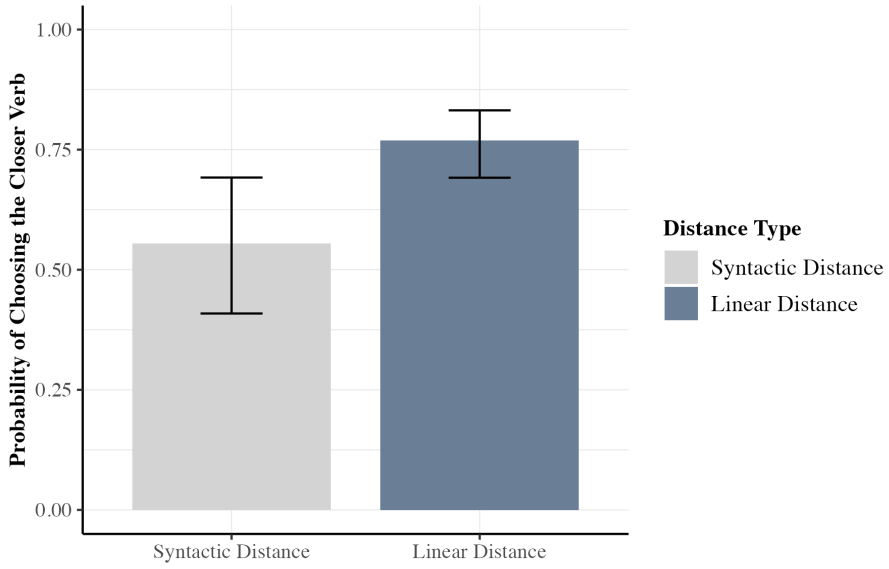

Figure 19. The probability of choosing the closer verb (V2) in Linear Distance and Syntactic Distance conditions for Experiment 3

The results of the analysis revealed that the probabilities of choosing the (linearly) closer verb were significantly higher in the Linear Distance condition as compared to Syntactic Distance Condition (β = .98, SE = .39, z = 2.47, p = .01). That is, participants more frequently chose V2-completions (closer) over V1-completions (distant) in the ambiguous sluicing sentences with coordinated antecedents, compared to those with subordinated antecedents.

4.3.6 Discussion

Experiment 3 investigated the effects of linear and syntactic distance on the offline processing of sluicing dependencies in Turkish sentences with two grammatically acceptable antecedent sites, focusing on the participants' sentence-final interpretations of the antecedent. The results indicated a significant effect of linear proximity in sentence-final antecedent interpretation. That is, participants preferred the linearly closer verb more often than the linearly distant verb in sentences with two coordinated antecedents (72.3%). This finding aligns with the locality effect

observed in previous research on sluicing processing (e.g., Frazier & Clifton, 1998; Carlson, 2013; Carlson et al., 2009; Harris, 2015; Harris & Carlson, 2016). However, since the structural positions of the correlates and verbs in the coordinated antecedents were parallel, and neither of the correlates or verbs distinctly carried sentential focus, it can be suggested that the effect was driven by linear proximity rather than focus, as argued by Frazier and Clifton (1998), or structural position, as posited by Harris (2015).

Surprisingly, the effect of syntactic proximity did not fully align with the predictions in this study and the findings of Experiment 2. Participants showed not significantly but slightly higher preference for verbs that were both syntactically and linearly closer, as indicated by the slightly higher number of V2-completions in the Syntactic Distance condition (53%). This can be attributed to the additional complexity in the subordinated antecedents, where the matrix verb required resolving an extra dependency with its objective clause. The fact that participants were only slightly more likely to choose the verb that was both linearly and syntactically closer suggests that the cognitive load increased when dealing with multiple layers of proximity. This may have resulted in higher competition between retrieval cues, ultimately reducing the preference for V2-completions. In other words, the presence of additional structural dependencies might have interfered with the efficiency of antecedent retrieval, as resolving multiple layers of proximity may demand more cognitive resources and increase processing difficulty.

In conclusion, Experiment 3 investigated the effects of linear and syntactic distance on offline sluicing processing in Turkish, focusing on participants' sentence-final interpretations of antecedents. The results confirmed a significant effect of linear distance, and some effects of syntactic distance albeit not as strong as

that of linear distance, replicating findings from Experiments 1 and 2. The reduced effects of syntactic proximity may be explained by the additional object-verb dependency in the syntactically closer conditions, which likely increased the memory load required for processing. This increased cognitive demands during sluicing resolution may have negatively impacted participants' decision-making, reducing the effect of syntactic proximity.

CHAPTER 5

GENERAL DISCUSSION AND CONCLUSION

5.1 Summary of the findings and general discussion

This study investigated if the processing of sluicing dependencies in Turkish is influenced by similarity-based interference from syntactically, morphologically, and semantically similar distractors. Additionally, it examined if the linear and syntactic distances of antecedents affected their retrieval and modulated the effects of similarity-based interference. To test these questions two eye-tracking experiments (Experiment 1 and Experiment 2) and one sentence-completion task (Experiment 3) were conducted. The eye-tracking experiments revealed that both linear and syntactic distance significantly affected sluicing processing, with greater difficulty observed for antecedents that were linearly or syntactically distant from the remnant of the sluiced clause. Furthermore, semantically similar distractors mostly increased processing difficulty, while morphologically similar distractors often facilitated processing. Additionally, the effect of similarity-based interference was particularly higher when the target antecedent had lower activation than the distractor TP such as when the target was linearly distant or it had a complex argument structure involving an embedded clause. The sentence completion task further demonstrated that the sensitivity to linear and syntactic distance was also present in the offline processing of sluicing, with participants favoring linearly and syntactically closer antecedents in their sentence-final interpretations. The findings from all three experiments and their implications for the memory processes involved in sluicing resolution will be discussed in greater detail below.

Eye-tracking Experiment 1 investigated if the processing of sluicing dependencies in Turkish was influenced by similarity-based interference from morphologically and semantically similar distractors. It also examined how the linear distance of antecedents impacts their retrieval and modulates the effects of interference. The experimental sentences had sluicing dependencies which had two potential antecedent sites coordinated with the conjunction *ve* ("and"). An example sentence is: *Ercan [birini*$_{\_correlate}$ *üzmüş*$_{\_target\_verb}$*]*$_{\_target\_TP}$ *ve [yazarı*$_{\_distractor\_NP}$ *eleştirmiş*$_{\_distractor\_verb}$*]*$_{\_distractor\_TP}$ *ama kimi*$_{\_remnant}$ *gerçekten bilmiyorum.* ("Ercan has upset someone-ACC and has criticized the author-ACC, but I really don't know who-ACC."). The experimental sentences were manipulated for the semantic and morphological similarity of the distractor NP (HighSem/HighMorph, LowSem/HighMorph, HighSem/LowMorph, and LowSem/LowMorph) and the antecedent's linear distance to the remnant of the sluiced clause (distant, recent). For Similarity, four conditions were tested to explore varying levels of interference: (1) LowSem/LowMorph, where the distractor matched the target only in syntactic category and structural position (object NP), serving as a baseline with minimal interference; (2) LowSem/HighMorph, where the distractor shared case features but not animacy features with the remnant; (3) HighSem/LowMorph, where the distractor shared animacy features but not case features; and (4) HighSem/HighMorph, where the distractor matched the remnant in both animacy and case features, creating the highest level of interference. While the baseline condition involved only syntactic similarity, the other conditions introduced additional layers of morphological and semantic interference, with the HighSem/HighMorph condition including interference at all levels. For Distance, the

target antecedent was either in a linearly distant position, preceding the distractor TP, or in a recent position, following the distractor TP.

The results of Experiment 1 revealed a significant effect of linear distance in processing Turkish sluicing dependencies, with linearly distant antecedents causing slowdowns at the retrieval site and longer analysis of antecedent regions, aligning with previously observed locality effects (Frazier & Clifton, 1998; Carlson et al., 2009; Harris, 2015). Locality effect in sluicing processing was noted as a preference among language users to associate the remnant of an ellipsis with the closest NP in the antecedent clause, which is typically the object NP. Previous research attributed these locality effects to structural position or focus, as objects tend to carry sentential focus in English (e.g., Frazier & Clifton, 1998; Carlson, 2013; Carlson et al., 2009; Harris & Carlson, 2016, among others). In Experiment 1, the structural positions of the correlates and verbs in the coordinated antecedents were parallel (both NPs were objects), and neither of the correlates or verbs distinctly carried sentential focus. While aligning with previously observed locality effects (e.g., Frazier & Clifton, 1998; Carlson et al., 2009; Harris, 2015, among others), the present findings suggest that linear proximity—not structural position or sentential focus—drives this effect, as the structural position of the potential correlate NPs was the same across the comparison conditions and neither the correlate nor the distractor NP were in a focus position. This finding, therefore, appears to align more closely with the predictions of the cue-based memory retrieval model, which attributes such slowdowns to the activation-based decay of distant memory targets as a general memory mechanism (Lewis & Vasishth, 2005; Van Dyke & Lewis, 2003; Martin & McElree, 2009; 2011; Van Dyke, 2011).

The results of Experiment 1 also showed that the effects of semantic and morphological similarity differed in their timing, direction (inhibitory vs. facilitatory), and distribution across critical regions. The effect of semantic similarity was mostly inhibitory and was particularly observed in later measures, for both recent and distant conditions. That is, semantic similarity caused slowdowns at the retrieval site and a longer reanalysis at the antecedent sites, aligning with previous research that showed increased difficulty from semantically similar distractors on the processing of subject-verb dependencies in English (e.g., Van Dyke, 2007; Van Dyke & McElree, 2011). In contrast, the effect of morphological similarity was mostly facilitatory, resulting in speedups in the processing of particularly earlier regions and earlier measures, specifically in distant antecedent conditions, also consistent with previous findings from English demonstrating facilitatory effects from morphological similarity due to agreement attraction in subject-verb dependencies (e.g., Wagers et al., 2009; Hammerly et al., 2019; Deniz et al., 2023).

One possible explanation for the observed differences between semantic and morphological similarity effects might be the distinct timing of these effects, reflecting differences in the timing of semantic and syntactic cue integration during the processing of long-distance dependencies. The results of Experiment 1 showed that syntactic effects emerged mostly in earlier measures and regions, while semantic effects emerged mostly in later measures and regions. These observations align with Van Dyke's (2007) findings, which showed that syntactic similarity effects at the critical region and semantic similarity effects in later regions. These results are also consistent with previous neuroimaging studies indicating that syntactic processing precedes semantic integration, as shown by earlier effects in ERP measures observed in syntactic violations as compared to semantic violations (e.g., Friederici, 2002;

Osterhout & Holcomb, 1992). Additionally, as noted by Mertzen et al. (2021), languages with overt case-marking systems, such as German, might show a primary reliance on morphosyntactic cues like case marking to resolve linguistic dependencies, making the effect of morphological similarity emerge earlier than that of semantic similarity. Given the morphological richness in Turkish, Turkish speakers might also be prioritizing these morphosyntactic cues in the initial stages of processing, leveraging the explicit morphological markers to establish dependency relations before integrating semantic information. This higher and primary reliance on morphosyntactic cues might have also caused further prioritization of morphological cues in earlier stages of processing (see Özturhan & Deniz, 2022, for evidence of cascaded cue integration and processing of morphological cues before syntactic cues).

If the parser primarily relied on morphosyntactic cues like case marking for the resolution of sluicing dependencies in Turkish, this may have facilitated retrieval by initially identifying the closest case-matching item. As a result, it would incorrectly retrieve the linearly closer distractor when it matched the morphological retrieval cues of the probe (the remnant). The consistent finding of the faster processing of the retrieval site and the decreased reanalysis of the target regions in distant conditions support this argument. And, if the parser relied on semantic cues in later stages of processing, competition among semantically similar items would have necessitated a reanalysis during the semantic integration stage which has been reported to occur later than the morphosyntactic integration stages (e.g., Friederici, 2002; Osterhout & Holcomb, 1992). This would explain the slowdown due to semantic similarity in later measures and the increased reanalysis of the target region in both distant and recent conditions. These findings provide further evidence for the

earlier/initial reliance on morphological cues followed by a later effect of semantic cues in processing sluicing dependencies in Turkish. Based on the previous findings from neuroimaging studies (e.g., Friederici, 2002; Osterhout & Holcomb, 1992) as well as several psycholinguistic experiments (e.g., Sturt, 2003; Van Dyke & McElree, 2011; Parker et al., 2017; and Deniz, 2022 for Turkish), the observed initial reliance on morphological cues can be interpreted as evidence that syntactic integration occurs before semantic integration. These findings can also be attributed to the language typology of Turkish, where the rich case-marking system likely promotes a higher dependence on morphosyntactic information during processing (see Mertzen et al., 2021, for similar observations for German).

Eye-tracking Experiment 2 examined if the processing of sluicing dependencies in Turkish was influenced by similarity-based interference from morphologically similar distractors and how the syntactic distance of antecedents impacts their retrieval and modulates the effects of interference. Similar to Experiment 1, the experimental sentences in Experiment 2 also had sluicing dependencies which had two potential antecedent sites, but instead of coordination, subordination was used. This was to test if the syntactic depth/distance of the antecedents impacts how they are retrieved and modulates the effects of similarity-based interference. Thus, the target antecedent was either in the matrix clause while the distractor TP was in the embedded clause, or the target antecedent was in the embedded clause and the distractor TP was in the matrix clause. The experimental sentences also manipulated the morphological similarity between the distractor NP and the remnant. An example sentence is: *Serkan [[birinden*$_{\_correlate}$ *korktuğunu*$_{\_target\_verb}$*]*$_{\_target\_TP}$ *patrondan*$_{\_distractor\_NP}$ *güçlükle gizlemiş*$_{\_distractor\_verb}$*]*$_{\_distractor\_TP}$ *ama kimden*$_{\_remnant}$ *maalesef bilmiyorum.* (“Serkan

has hardly hidden that he is afraid of someone-ABL from the boss-ABL, but unfortunately I don't know who-ABL."). The experimental sentences were manipulated for the morphological similarity of the distractor NP (HighMorph, LowMorph) and the antecedent's syntactic distance to the remnant of the sluiced clause (Embd, Unembd). For Morphological Similarity, the HighMorph conditions involved distractor NPs sharing case features with the remnant, while LowMorph conditions served as a baseline with no matching case features. For Syntactic Distance, the target antecedent was either embedded (Embd) or unembedded (Unembd) relative to the distractor clause.

In Experiment 2, it was hypothesized that syntactic distance would influence antecedent retrieval, with syntactically distant (embedded) antecedents being harder to retrieve than closer (unembedded) ones, as also observed in previous research showing greater difficulty in processing object-relative clauses compared to subject-relative clauses, as objects are more deeply embedded (e.g., Gibson, 2000; Staub, 2010). Experiment 1 showed that morphological similarity primarily affected distant antecedents, often through facilitation. Based on this, it was also predicted that morphological similarity would exhibit facilitation, especially for syntactically distant antecedents.

The results of Experiment 2 showed that syntactically distant antecedents caused greater processing difficulty, as shown by longer reading times at the retrieval and antecedent sites. Embedding appeared to have made antecedent retrieval more challenging, aligning with the predicted higher cognitive load for items in deeply embedded positions. In DLT, this challenge is expected to stem from the greater memory and integration costs that arise from the increased syntactic distance between the head and its dependent in long-distance dependencies (Gibson, 1998;

2000). The results of Experiment 2 provided further evidence of the effect of syntactic distance on memory processes during sluicing processing by showing that syntactic distance increased the difficulty of the antecedent's retrieval, even when its linear distance was controlled for.

The greater processing difficulty observed for the embedded antecedents may also stem from the implicitly projected prosodic boundaries associated with them. Previous research has demonstrated that comprehenders efficiently utilize projected prosodic cues in dependency resolution during sentence comprehension (e.g., Schafer, 1997; Fodor, 2002; Fodor et al., 2017; Fodor et al., 2019). According to Schafer's (1997) prosodic visibility hypothesis (PVH), the visibility of syntactic attachment sites depends on the sentence's prosodic structure. Given the predictions of the PVH, a potential target may be the most accessible (i.e., visible) when it is within the same prosodic domain as its probe. As such, prosodic boundaries around the embedded antecedent clause may have reduced its accessibility during retrieval at the remnant, contributing to the increased processing difficulty observed when the antecedent was embedded rather than unembedded.

The results of Experiment 2 also showed that morphologically similar distractors facilitated processing in earlier regions and measures, as indicated by a speed-up at the retrieval site in early measures. However, morphological similarity led to inhibitory effects in later regions and measures, reflected in higher RRD and PRI at the correlate region, suggesting increased reanalysis during later stages of dependency resolution. The observed facilitatory effects in early regions were consistent with Experiment 1, where morphological similarity facilitated early retrieval, especially for distant antecedents, aligning with prior studies reporting similar effects of morphologically similar distractors in English subject-verb

dependencies (Wagers et al., 2009; Dillon et al., 2013; Deniz et al., 2023). However, the inhibitory effects observed in later regions and measures were less anticipated. One possible interpretation is that these inhibitory effects in target regions were due to the combined influence of morphosyntactic and semantic similarity. That is, in Experiment 2, both the correlate and the distractor NPs shared matching semantic cues (animacy), while morphological case similarity was manipulated between conditions. As a result, the high morphological similarity condition also included a distractor with both semantic and morphological similarity. This was similar to the results in Experiment 1 where morphological similarity also led to inhibitory effects when combined with semantic similarity. Thus, the additional semantic similarity in the high morphological interference condition in Experiment 2 might have caused reanalysis of target regions during later stages of sentence processing involving semantic integration, leading to increased reanalysis of the target regions when there is a competition among semantically similar items during antecedent retrieval.

Surprisingly, the observed effect of syntactic distance on similarity-based interference in Experiment 2 did not fully align with the predictions of increased interference for syntactically more distant targets. In contrast, the effect was more prominent when the target antecedent was syntactically closer, i.e., unembedded. The stronger activation of the embedded distractor may have amplified the interference effects driven by case similarity. In Experiment 2, the unembedded antecedent included the embedded antecedent as one of its arguments, requiring the resolution of an additional object-verb dependency between the target verb of the unembedded antecedent and its clausal object, the embedded antecedent. During this resolution, morphological cues from the distractor TP might have been reactivated, as would be predicted by the cue-based memory retrieval model (Lewis & Vasishth, 2005). This

reactivation could have increased interference from the distractor. Thus, when the target was in an unembedded position and the distractor was in an embedded position, the distractor may have had higher activation than the target, thereby the effect of similarity-based interference might have been amplified in the unembedded antecedent conditions.

Although the activation-based decay prediction of the cue-based memory retrieval model can predict this amplification of similarity-based interference effects observed in syntactically complex embedded structures, the results cannot provide clear evidence of the impact of syntactic distance on cue interference due to a limitation in Experiment 2, where the argument structure of the syntactically closer (unembedded) antecedents' VP was also more complex (ditransitive) as compared to the argument structure of the embedded antecedents' VP (transitive) which was consistently simpler. In these unembedded antecedents, an additional dependency resolution for the second argument likely increased the difficulty of dependency resolution. This may have resulted in higher cognitive demands in processing unembedded antecedents, making the retrieval more susceptible to interference from a cue-matching distractor. A follow-up experiment ensuring consistency in argument structures between embedded and unembedded antecedents will be necessary to clarify whether the observed effects arise from syntactic distance or the activation differences between the target and the distractor.

The results of Experiment 1 and Experiment 2 demonstrated that the case of the remnant serves as an effective retrieval cue during antecedent retrieval. However, it is important to note that the morphological manipulation in these experiments involved remnants marked with accusative, dative, or ablative cases (e.g., who-ACC/DAT/ABL), which differ in their structural properties. Structural cases, such as

nominative and accusative, are licensed based on syntactic structure, whereas non-structural cases, such as dative, locative, and ablative can be either lexically licensed (i.e., lexical cases) or licensed by particular θ-roles (i.e., inherent cases) (Woolford, 2006). Due to the idiosyncratic nature of lexical cases and the predictability of inherent cases based on θ-role assignments, non-structural cases (e.g., dative and ablative in Experiments 1 and 2) may have higher predictability—and thus greater cue-diagnosticity—compared to structural cases (e.g., accusative). While this study does not provide sufficient data to conclusively analyze the differences between structural and non-structural cases as morphological cues during sluicing resolution in Turkish, it is plausible that these differences influenced their processing in the present experiments. Future work can examine if structural and inherent cases differentially affect cue-retrieval processes in Turkish sentence processing in general and sluicing resolution specifically.

Experiment 3 tested how the linear and syntactic distance affected the participants' end-of-sentence judgments regarding their preferences for antecedents in globally ambiguous sluicing dependencies. The experimental sentences were similar to those in Experiments 1 and 2, except that they were globally ambiguous. The experimental sentences manipulated the linear and syntactic distance of the antecedents to the remnant of the sluiced clause, thus, the antecedent sites were presented in either coordinated or subordinated structures. An example sentence for linear distance condition is: *Cansu [bir çalışanı beğenmiş*$_{V1}$*]*$_{ANTECEDENT\_1}$ *ve [bir görevliyi incelemiş*$_{V2}$*]*$_{ANTECEDENT\_2}$ *fakat kimi*$_{REMNANT}$ _____$_{E\text{-}SITE}$ *aslında anlamadık.* ("Cansu liked a worker and inspected an officer, but we actually didn't understand who."). An example sentence for syntactic distance condition is: *Cansu [bir çalışanı bugün [bir görevliyi incelemeye*$_{V1}$*]*$_{ANTECEDENT\_1}$

göndermiş$_{V2}$*]*$_{ANTECEDENT\_2}$ *fakat kimi*$_{REMNANT}$ _____$_{E\text{-}SITE}$ *aslında anlamadık.* ("Cansu sent a worker today to inspect an officer, but we actually didn't understand who."). The participant's task was to complete the blank at the *e*-site of the sluiced clause with one of the two verbs given as options (V1 vs. V2). For the linear distance condition, V1 referred to the linearly distant verb, while V2 was the linearly closer verb. In the syntactic distance condition, V1 represented the verb that was both syntactically and linearly distant, whereas V2 was both syntactically and linearly closer. Previous research has shown that locality effects influence the resolution of sluicing dependencies, where language users favor structurally or linearly closer correlates (Frazier & Clifton, 1998; Carlson et al., 2009; Harris, 2015). Experiment 1 and Experiment 2 revealed that both linear and syntactic distance significantly affected processing, with longer reading times observed when the antecedent was linearly or syntactically distant from the retrieval site. Experiment 3 tested these effects offline to determine whether linear or syntactic proximity is a stronger factor in resolving sluicing dependencies. If participants prioritized linear proximity, they were predicted to choose verbs from linearly closer antecedents, while syntactic proximity would result in preferences for verbs from syntactically unembedded clauses. However, if both types of proximity interacted, the highest preferences were predicted to emerge for verbs associated with the antecedents that were both syntactically unembedded and linearly close.

The results confirmed a significant effect of linear distance and some effects of syntactic distance, replicating findings from Experiments 1 and 2. Participants more frequently selected the closer verb in sentences with both coordinated antecedents and subordinated antecedents. The effect of linear proximity was in line with the locality effects observed in previous research (e.g., Frazier & Clifton, 1998;

Carlson et al., 2009; Harris, 2015, among others). However, since the structural positions of the correlates and verbs in the coordinated antecedents were parallel, and neither of the correlates or verbs distinctly carried sentential focus, it can be suggested that the effect was driven by linear proximity rather than focus, as argued by Frazier and Clifton (1998), or structural position, as posited by Harris (2015).

Surprisingly, the effect of syntactic proximity (53.7%) was not as strong as the effect of linear distance (72.3%). The reduced effects of syntactic proximity may be explained by the increased complexity of the structures in which it was manipulated. That is the sentences with syntactic distance manipulation involved embedded antecedents, thus, the resolution of the sluicing dependency required resolving an additional object-verb dependency for the unembedded antecedent (e.g, between the V2, *göndermiş* "sent", and its clausal object, *bir görevliyi incelemeye*, "to inspect and officer" in the examples above), thereby creating higher cognitive load. This complexity likely increased the memory load required for processing the sluicing dependency. Thus, the syntactic proximity effect might have been reduced by the cognitive load imposed by the additional structural dependencies in the subordinated antecedents. This aligns with the observations from Experiment 2, where the effect of similarity was surprisingly not stronger for syntactically more distant antecedents as compared to syntactically closer antecedents. The planned follow-up study for Experiment 2 could also include an offline task similar to Experiment 3 to further clarify the effect of syntactic distance, independent of linear distance, by controlling for argument structures across the two conditions.

As a final point, it is worth noting that in all three experiments of this study, the remnant of the sluiced clause was consistently a non-D-linked *wh*-phrase (e.g., kim-i "who-ACC"). D-linking refers to a phenomenon where the answers to a *wh*-

question are expected to come from a specific set of items that have either been mentioned earlier in the discourse or are part of the shared knowledge between the speaker and the listener (Pesetsky, 1987; 2000). *Wh*-questions with "which" are typically considered D-linked because they imply a reference to a more specific set of items, as a result, D-linked *wh*-remnants (e.g., *which*-phrases) have higher specificity than non-D-linked *wh*-remnants (e.g., *who* or *what*). During sluicing processing, the specificity of the remnant could potentially serve as an additional cue in the retrieval of the antecedent. In line with that, previous studies on sluicing processing have shown that processing is facilitated when the specificity of the remnant increases, particularly when there is greater parallelism between the remnant and its correlate (e.g., Nykiel, 2013; Harris, 2015). Since the remnant in the present experimental items was consistently non-D-linked (i.e., non-specific), it presumably did not affect the present results. Still, future research can examine if the specificity of the remnant could also influence antecedent retrieval by directly comparing D-linked remnants with non-D-linked ones.

5.2 Conclusion

The findings from the three experiments demonstrated that both linear and syntactic distance significantly affected antecedent retrieval and similarity-based interference during the processing of sluicing dependencies. The findings also demonstrated that the effect of morphological similarity was mostly facilitative and emerged earlier, whereas, the effect of semantic similarity was mostly inhibitory and emerged later, and the effect of similarity-based interference was especially higher when the target had lower activation than the distractor.

Linear distance had a notable impact on both online and offline processing of sluicing dependencies in Turkish, with increased linear distance making the retrieval of the antecedent more difficult in real-time processing, and decreasing the preferability of antecedents in sentence-final interpretations. Since the experiments controlled for the focus and syntactic position of the correlates across conditions, the findings did not fully align with prior claims that the locality effect is driven by focus, as proposed by Frazier and Clifton (1998), or by structural position, as suggested by Harris (2015), but suggested that the effect might also arise more independently of these factors. These results align more closely with the predictions of activation-based decay of the cue-based memory retrieval model (Lewis & Vasishth, 2005; Van Dyke & McElree, 2011), which attribute retrieval difficulty to memory decay over time, particularly for distant antecedents. Syntactically distant (embedded) antecedents also caused greater difficulty during the resolution of sluicing dependencies, aligning with previous literature that emphasizes the impact of hierarchical structure on linguistic dependency processing (e.g., DLT; Gibson, 1998; 2000; syntactic distance hypothesis; Bock & Cutting, 1992; Solomon & Pearlmutter, 2004; Franck et al., 2002; garden-path model; Frazier & Fodor, 1978; Frazier, 1987).

The findings on the similarity-based interference from semantic and morphological cues in sluicing resolution in Turkish supported the main predictions of the cue-based memory retrieval model, and were consistent across both Experiments 1 and 2. The effect of semantic similarity was generally inhibitory and emerged in later processing stages, as evidenced by slowdowns at the retrieval site and increased reanalyses of the target regions, which was consistent with previous research showing inhibitory effects of semantic similarity in the resolution of

subject-verb dependencies (e.g., Van Dyke, 2007; Van Dyke & McElree, 2011). Morphological similarity, by contrast, facilitated processing through faster and easier processing in the earlier stages, supporting previous findings from the processing of subject-verb dependencies in English showing that intervening distractors with higher morphological similarity eased dependency resolution (Hammerly et al., 2019; Deniz et al., 2023). Additionally, the effect of similarity-based interference was overall amplified when the distractor had a higher activation level than the target, in line with the activation-based decay prediction of the cue-based memory retrieval model (Lewis & Vasishth, 2005).

Lastly, the findings on the distinctive effects of morphological and semantic similarity have significant implications for the influence of language typology and the cognitive processes underlying the integration of morphosyntactic and semantic information during sentence processing. Both Experiment 1 and Experiment 2 demonstrated that the effect of morphological similarity emerged earlier than that of semantic similarity. This aligns with Van Dyke (2007), who reported a similar precedence of morphosyntactic over semantic cues in the processing of subject-verb dependencies in English. Supporting this, previous neuroimaging studies (e.g., Friederici, 2002; Osterhout & Holcomb, 1992) have shown that syntactic processing generally precedes semantic integration during sentence comprehension. The current findings further corroborate these behavioral and neuroimaging observations, offering additional evidence for the hierarchical nature of morphosyntactic and semantic cue integration.

Furthermore, the earlier effect of morphological similarity observed in Turkish may reflect the earlier use of morphosyntactic cues due to typological features like overt case marking. For instance, Mertzen et al. (2021) found that in

German, a typologically similar language with explicit syntactic case marking, morphosyntactic cues took precedence over semantic cues, with their effects appearing earlier in subject-verb dependency resolution. In contrast, this distinction was absent in English, where semantic integration occurred alongside syntactic processing. Similarly, Turkish may rely more heavily on morphosyntactic cues for dependency resolution than morphologically poorer languages such as English. These findings underscore the role of language-specific features in shaping cue precedence and highlight the influence of typology on processing long-distance dependencies (please see Deniz, 2025, for evidence of language-specific parsing dependent on morphology in Turkish). Thus, the findings of the present study also give support to the effect of language-specific features in shaping cue precedence and highlight the influence of typology on processing long-distance dependencies.

5.3 Limitations and future directions

The present study, through two eye-tracking experiments and one sentence-completion task, offered new insights into the role of syntactic, semantic, and morphological cues in antecedent retrieval, as well as the effect of antecedent linear and syntactic distance on the processing of sluicing dependencies in Turkish. These findings offer important implications for cross-linguistic research on sluicing processing and contribute to the growing body of research on the cognitive mechanisms underlying the processing of long-distance dependencies in general. They also highlight potential differences in the prominence of semantic and syntactic information during language processing across various language typologies. However, there were a few limitations that should be noted.

First, in Experiments 2 and 3, the manipulation of syntactic distance relied on antecedents with distinct argument structures. The embedded antecedents consisted of a transitive verb and an NP object, while the unembedded antecedents included a ditransitive verb, an NP object, and a clausal object. Notably, the clausal object of the unembedded antecedent contained the embedded antecedent as one of its arguments. Consequently, retrieving the correlate from the embedded antecedent required resolving an object-verb dependency for its NP object. In contrast, retrieving the correlate from the unembedded antecedent likely involved resolving a more complex structure with two objects. This necessitated an additional object-verb dependency resolution, potentially imposing greater processing demands during antecedent retrieval. Future studies could address this by using non-embedded subordinate clauses like *if*-clauses which would eliminate the additional dependency resolution.

Second, the manipulation of syntactic depth in Experiments 2 and 3 was intertwined with linear distance, creating a potential confound. To maintain natural Turkish word order, the target verbs were positioned closer in unembedded conditions and farther in embedded conditions. As a result, certain conditions introduced an overlap between the linear and syntactic distance manipulation. That is, in syntactically closer (i.e., unembedded) conditions, the target verb was also linearly closer to the remnant than the distractor verb. Whereas, in syntactically distant (i.e., embedded) conditions, the target verb was also linearly more distant to the remnant than the distractor verb. This overlap made it difficult to determine whether the observed effects were due to syntactic depth or linear distance. As mentioned above, a future study can manipulate syntactic depth by using subordinate clauses such as *if*-clauses which do not introduce additional syntactic embedding.

Additionally, while participants in the present study had similar educational backgrounds and age groups, individual differences in working memory capacity were not considered. These differences could influence information processing and integration, particularly in tasks requiring attention or decision-making. Including working memory as a covariate in future studies could help reduce confounding effects and clarify its role in the findings.

One final consideration is the ecological validity of the eye-tracking methodology. While it offers precision, it may not fully account for the complexity of real-world settings and fails to capture the contribution of auditory cues, such as pitch and prosody, in language processing. Future research could incorporate auditory stimuli or employ cross-modal designs to explore interactions between visual and auditory modalities. These approaches could provide converging evidence and a more comprehensive understanding of sluicing processing and cognitive mechanisms.

APPENDIX A

ETHICS COMMITTEE APPROVAL

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ REKTÖRLÜĞÜ
Sosyal ve Beşeri Bilimler İnsan Araştırmaları Etik Kurulu (Sbinarek)

Sayı : E-84391427-050.01.04-159651 26.12.2023
Konu : 2023-34T Kayıt Numaralı Başvurunuz Hakkında

Sayın Dr. Öğr. Üyesi Nazik DİNÇTOPAL DENİZ

Tez danışmanlığını yürüttüğünüz öğrenciniz Nevroz Dilan Tanal Dırağ'ın "An investigation of syntactic, morphological and semantic cues in processing sluicing in Turkish" başlıklı projesi ile Boğaziçi Üniversitesi Sosyal ve Beşeri Bilimler İnsan Araştırmaları Etik Kurulu (SBİNAREK)'e yaptığınız 2023-34T kayıt numaralı başvuru 22.12.2023 tarih ve 2023/10 sayılı kurul toplantısında incelenmiş ve projeye etik onay verilmesi uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya on-line olarak katılımıyla ve oybirliği ile alınmıştır. Onay mektubu tüm üyeler adına Komisyon Başkanı tarafından e-imzalanmıştır. Bilgilerinizi rica ederiz.

Saygılarımızla,

Dr. Öğr. Üyesi Işıl ERDUYAN
Kurul Başkanı

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Belge Doğrulama Kodu : 0I6Y-YLVI-0T1E Belge Doğrulama Adresi : https://www.turkiye.gov.tr/bogazici-universitesi-ebys

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Bilgi İçin:Nurşen MUNAR
Mühendis
Telefon No:

APPENDIX B

BACKGROUND QUESTIONNAIRE

Demografik Bilgi (Demographic Information): Bu bölümdeki sorular sizin hakkınızda genel bilgi edinme amaçlıdır. (The questions in this section aims to gather general information about you.)

1. Yaşınız (Age): _____

2. Doğum yeriniz (Place of birth): _____

3. Cinsiyetiniz (Gender): _____

4. Mesleğiniz (Occupation): _____

5. En son aldığınız eğitim seviyesi nedir? (What is the highest degree you earned?)

a) İlköğretim (Elementary school) b) Ortaokul (Secondary school)

c) Lise (Highschool) d) Üniversite (College)

e) Yüksek lisans (Master's degree) f) Doktora (PhD degree)

6. Herhangi bir işitme probleminiz var mı? (Do you have any hearing problem?)

a) Evet (Yes) b) Hayır (No)

7. Cevabınız 'evet'se sorunu nasıl gideriyorsunuz? (If yes, how do you correct it?)

a) İşitme cihazı kullanıyorum. (I use hearing aid.)

b) Diğer (Lütfen belirtiniz) (Other (Please specify)): _____

8. Görme probleminiz var mı? (Do you have any vision problem?)

a) Evet (Yes) b) Hayır (No)

9. Cevabınız 'evet'se sorunu nasıl gideriyorsunuz? (If yes, how do you address it?)

a) Gözlük kullanıyorum. (I use glasses.)

b) Kontakt lens kullanıyorum. (I use contact lenses.)

c) Diğer (Lütfen belirtiniz) (Other (Please specify)): _____

10. Sağ elinizi mi sol elinizi mi daha sık kullanıyorsunuz? (Are you right-handed or left-handed?)

a) Sağ (Right) b) Sol (Left)

Dil Geçmişi (Language Background): Anketin bu bölümü dil geçmişinizi ve dil ile ilgili aktiviteleriniz üzerine sorular içermektedir. (This section of the questionnaire aims to elicit information about your language background and language-related activities.)

1. Türkçe anadiliniz mi? (Is Turkish your native language?)

a) Evet (Yes) b) Hayır (No)

2. Cevabınız 'hayır'sa anadiliniz nedir? Lütfen belirtiniz (If no, what is your native language? Please specify): _____

3. Anadilinizden başka bir dil konuşuyor musunuz? (Do you speak a language other than your native language?)

a) Evet (Yes) b) Hayır (No)

4. Cevabınız 'evet'se lütfen dil(ler)deki yeterliliğinizi 1'in zayıf, 5'in mükemmel olduğu, 1-5 arası ölçekte belirtiniz (If yes, how would you rate your linguistic ability in that language(s) in the following areas?):

Dil (Language)	Okuma (Reading)	Dinleme (Listening)	Yazma (Writing)	Konuşma (Speaking)

5. Eğitiminizi hangi dilde aldınız? (What was the main medium of instruction language for your education?)

İlköğretim (Elementary school):

a) Türkçe (Turkish) b) Diğer (Other (please specify)): _____

Ortaokul (Secondary school):

a) Türkçe (Turkish) b) Diğer (Other (please specify)): _____

Lise (Highschool):

a) Türkçe (Turkish) b) Diğer (Other (please specify)): _____

Üniversite (College):

a) Türkçe (Turkish) b) Diğer (Other (please specify)): _____

Lisansüstü (Master's and above):

a) Türkçe (Turkish) b) Diğer (Other (please specify)): _____

6. Türkçe'nin anadil olmadığı herhangi bir ülkede yaşadınız mı? (Have you ever lived in a non-Turkish-speaking country?)

a) Evet (Yes) b) Hayır (No)

7. Cevabınız 'evet'se, nerede ve ne kadar kaldınız? (If yes, where and how long did you live?) _____

8. Haftada ne kadar Türkçe okuma yapıyorsunuz? (How much time do you spend reading in Turkish per week?)

a) 5 saatten az (less than 5 hours) b) 5-10 saat (5-10 hours)

c) 10-15 saat (10-15 hours) d)15 saatten fazla (more than 15 hours)

9. Haftada kaç saat Türkçe (müzik, radyo vs.) dinliyorsunuz? (How much time do you spend listening in Turkish (music, radio etc.) per week?)

a) 5 saatten az (less than 5 hours) b) 5-10 saat (5-10 hours)

c) 10-15 saat (10-15 hours) d)15 saatten fazla (more than 15 hours)

10. Haftada kaç saat Türkçe görüntülü medya seyrediyorsunuz? (How much time do you spend watching visual media in Turkish per week?)

a) 5 saatten az (less than 5 hours) b) 5-10 saat (5-10 hours)

c) 10-15 saat (10-15 hours) d)15 saatten fazla (more than 15 hours)

APPENDIX C

EXPERIMENTAL ITEMS FOR EXPERIMENT 1

1.
   a. Distant, HighSem/HighMorph: Caner birini savunmuş ve şairi dinlemiş ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   b. Distant, LowSem/HighMorph: Caner birini savunmuş ve kapıyı dinlemiş ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   c. Distant, HighSem/LowMorph: Caner birini savunmuş ve şaire bağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   d. Distant, LowSem/LowMorph: Caner birini savunmuş ve kapıya bağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   e. Recent, HighSem/HighMorph: Caner şairi dinlemiş ve birini savunmuş ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   f. Recent, LowSem/HighMorph: Caner kapıyı dinlemiş ve birini savunmuş ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   g. Recent, HighSem/LowMorph: Caner şaire bağırmış ve birini savunmuş ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
   h. Recent, LowSem/LowMorph: Caner kapıya bağırmış ve birini savunmuş ama kimi gerçekten bilmiyoruz. (Comprehension Question: Savunan Taner midir?)
2.
   a. Ahmet birini üzmüş ve kasiyeri kırmış ama kimi maalesef belli değil. (Comprehension Question: Ahmet kasiyeri mi kırmış?)
   b. Ahmet birini üzmüş ve bilgisayarı kırmış ama kimi maalesef belli değil. (Comprehension Question: Ahmet bilgisayarı mı kırmış?)
   c. Ahmet birini üzmüş ve kasiyere kızmış ama kimi maalesef belli değil. (Comprehension Question: Ahmet kasiyere mi kızmış?)
   d. Ahmet birini üzmüş ve bilgisayara kızmış ama kimi maalesef belli değil. (Comprehension Question: Ahmet bilgisayara mı kızmış?)
   e. Ahmet kasiyeri kırmış ve birini üzmüş ama kimi maalesef belli değil. (Comprehension Question: Ahmet kasiyeri mi kırmış?)
   f. Ahmet bilgisayarı kırmış ve birini üzmüş ama kimi maalesef belli değil. (Comprehension Question: Ahmet bilgisayarı mı kırmış?)
   g. Ahmet kasiyere kızmış ve birini üzmüş ama kimi maalesef belli değil. (Comprehension Question: Ahmet kasiyere mi kızmış?)
   h. Ahmet bilgisayara kızmış ve birini üzmüş ama kimi maalesef belli değil. (Comprehension Question: Ahmet bilgisayara mı kızmış?)

3.
   a. Serkan birini çağırmış ve hastayı korumuş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   b. Serkan birini çağırmış ve bavulu korumuş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   c. Serkan birini çağırmış ve hastaya ulaşmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   d. Serkan birini çağırmış ve bavula ulaşmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   e. Serkan hastayı korumuş ve birini çağırmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   f. Serkan bavulu korumuş ve birini çağırmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   g. Serkan hastaya ulaşmış ve birini çağırmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
   h. Serkan bavula ulaşmış ve birini çağırmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kasten’ kelimesi geçti mi?)
4.
   a. Ercan birini kıskanmış ve bakıcıyı saklamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   b. Ercan birini kıskanmış ve çantayı saklamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   c. Ercan birini kıskanmış ve bakıcıya kavuşmuş ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   d. Ercan birini kıskanmış ve çantaya kavuşmuş ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   e. Ercan bakıcıyı saklamış ve birini kıskanmış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   f. Ercan çantayı saklamış ve birini kıskanmış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   g. Ercan bakıcıya kavuşmuş ve birini kıskanmış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   h. Ercan çantaya kavuşmuş ve birini kıskanmış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
5.
   a. Semra birini aldatmış ve senaristi aramış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)
   b. Semra birini aldatmış ve anahtarı aramış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)
   c. Semra birini aldatmış ve senaristten kurtulmuş fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)

d. Semra birini aldatmış ve anahtardan kurtulmuş fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)
e. Semra senaristi aramış ve birini aldatmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)
f. Semra anahtarı aramış ve birini aldatmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)
g. Semra senaristten kurtulmuş ve birini aldatmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)
h. Semra anahtardan kurtulmuş ve birini aldatmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Aldatan Selma mıdır?)

6.
a. Dilek birini oyalamış ve işçiyi izlemiş fakat kimi şimdilik belli değil. (Comprehension Question: Dilek işçiyi mi izlemiş?)
b. Dilek birini oyalamış ve filmi izlemiş fakat kimi şimdilik belli değil. (Comprehension Question: Dilek filmi mi izlemiş?)
c. Dilek birini oyalamış ve işçiden bunalmış fakat kimi şimdilik belli değil. (Comprehension Question: Dilek işçiden mi bunalmış?)
d. Dilek birini oyalamış ve filmden bunalmış fakat kimi şimdilik belli değil. (Comprehension Question: Dilek filmden mi bunalmış?)
e. Dilek işçiyi izlemiş ve birini oyalamış fakat kimi şimdilik belli değil. (Comprehension Question: Dilek işçiyi mi izlemiş?)
f. Dilek filmi izlemiş ve birini oyalamış fakat kimi şimdilik belli değil. (Comprehension Question: Dilek filmi mi izlemiş?)
g. Dilek işçiden bunalmış ve birini oyalamış fakat kimi şimdilik belli değil. (Comprehension Question: Dilek işçiden mi bunalmış?)
h. Dilek filmden bunalmış ve birini oyalamış fakat kimi şimdilik belli değil. (Comprehension Question: Dilek filmden mi bunalmış?)

7.
a. Ayşe birini beklemiş ve asistanı görmüş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)
b. Ayşe birini beklemiş ve haberi görmüş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)
c. Ayşe birini beklemiş ve asistandan bıkmış fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)
d. Ayşe birini beklemiş ve haberden bıkmış fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)
e. Ayşe asistanı görmüş ve birini beklemiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)
f. Ayşe haberi görmüş ve birini beklemiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)
g. Ayşe asistandan bıkmış ve birini beklemiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)

h. Ayşe haberden bıkmış ve birini beklemiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘aslında’ kelimesi geçti mi?)

8.
a. Ecem birini kızdırmış ve yazarı susturmuş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
b. Ecem birini kızdırmış ve müziği susturmuş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
c. Ecem birini kızdırmış ve yazardan korkmuş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
d. Ecem birini kızdırmış ve müzikten korkmuş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
e. Ecem yazarı susturmuş ve birini kızdırmış fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
f. Ecem müziği susturmuş ve birini kızdırmış fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
g. Ecem yazardan korkmuş ve birini kızdırmış fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)
h. Ecem müzikten korkmuş ve birini kızdırmış fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘vallahi’ kelimesi geçti mi?)

9.
a. Berk birinden utanmış ve komşudan kaçmış ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
b. Berk birinden utanmış ve kameradan kaçmış ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
c. Berk birinden utanmış ve komşuya gülmüş ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
d. Berk birinden utanmış ve kameraya gülmüş ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
e. Berk komşudan kaçmış ve birinden utanmış ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
f. Berk kameradan kaçmış ve birinden utanmış ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
g. Berk komşuya gülmüş ve birinden utanmış ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)
h. Berk kameraya gülmüş ve birinden utanmış ama kimden detaylı bilmiyoruz. (Comprehension Question: Utanan Berke midir?)

10.
a. Samet birinden vazgeçmiş ve pilottan uzaklaşmış ama kimden doğrusu belli değil. (Comprehension Question: Samet pilottan mı uzaklaşmış?)
b. Samet birinden vazgeçmiş ve duvardan uzaklaşmış ama kimden doğrusu belli değil. (Comprehension Question: Samet duvardan mı uzaklaşmış?)

c. Samet birinden vazgeçmiş ve pilota yaslanmış ama kimden doğrusu belli değil. (Comprehension Question: Samet pilota mı yaslanmış?)
d. Samet birinden vazgeçmiş ve duvara vurmuş ama kimden doğrusu belli değil. (Comprehension Question: Samet duvara mı yaslanmış?)
e. Samet pilottan uzaklaşmış ve birinden vazgeçmiş ama kimden doğrusu belli değil. (Comprehension Question: Samet pilottan mı uzaklaşmış?)
f. Samet duvardan uzaklaşmış ve birinden vazgeçmiş ama kimden doğrusu belli değil. (Comprehension Question: Samet duvardan mı uzaklaşmış?)
g. Samet pilota yaslanmış ve birinden vazgeçmiş ama kimden doğrusu belli değil. (Comprehension Question: Samet pilota mı yaslanmış?)
h. Samet duvara yaslanmış ve birinden vazgeçmiş ama kimden doğrusu belli değil. (Comprehension Question: Samet duvara mı yaslanmış?)

11.
a. Burak birinden hoşlanmış ve oyuncudan bunalmış ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
b. Burak birinden hoşlanmış ve mektuptan bunalmış ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
c. Burak birinden hoşlanmış ve oyuncuya güvenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
d. Burak birinden hoşlanmış ve mektuba güvenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
e. Burak oyuncudan bunalmış ve birinden hoşlanmış ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
f. Burak mektuptan bunalmış ve birinden hoşlanmış ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
g. Burak oyuncuya güvenmiş ve birinden hoşlanmış ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)
h. Burak mektuba güvenmiş ve birinden hoşlanmış ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘açıkça’ kelimesi geçti mi?)

12.
a. Mert birinden kuşkulanmış ve garsondan kurtulmuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
b. Mert birinden kuşkulanmış ve arabadan kurtulmuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
c. Mert birinden kuşkulanmış ve garsona yaklaşmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
d. Mert birinden kuşkulanmış ve arabaya yaklaşmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)

e. Mert garsondan kurtulmuş ve birinden kuşkulanmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
f. Mert arabadan kurtulmuş ve birinden kuşkulanmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
g. Mert garsona yaklaşmış ve birinden kuşkulanmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
h. Mert arabaya yaklaşmış ve birinden kuşkulanmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)

13.
a. Esra birinden şüphelenmiş ve turistten kaçınmış fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
b. Esra birinden şüphelenmiş ve radyodan kaçınmış fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
c. Esra birinden şüphelenmiş ve turisti susturmuş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
d. Esra birinden şüphelenmiş ve radyoyu susturmuş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
e. Esra turistten kaçınmış ve birinden şüphelenmiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
f. Esra radyodan kaçınmış ve birinden şüphelenmiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
g. Esra turisti susturmuş ve birinden şüphelenmiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)
h. Esra radyoyu susturmuş ve birinden şüphelenmiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Şüphelenen Eda mıdır?)

14.
a. Selin birinden soğumuş ve emlakçıdan bıkmış fakat kimden maalesef belli değil. (Comprehension Question: Selin emlakçıdan mı bıkmış?)
b. Selin birinden soğumuş ve telefondan bıkmış fakat kimden maalesef belli değil. (Comprehension Question: Selin telefondan mı bıkmış?)
c. Selin birinden soğumuş ve emlakçıyı kırmış fakat kimden maalesef belli değil. (Comprehension Question: Selin emlakçıyı mı kırmış?)
d. Selin birinden soğumuş ve telefonu kırmış fakat kimden maalesef belli değil. (Comprehension Question: Selin telefonu mu kırmış?)
e. Selin emlakçıdan bıkmış ve birinden soğumuş fakat kimden maalesef belli değil. (Comprehension Question: Selin emlakçıdan mı bıkmış?)
f. Selin telefondan bıkmış ve birinden soğumuş fakat kimden maalesef belli değil. (Comprehension Question: Selin telefondan mı bıkmış?)
g. Selin emlakçıyı kırmış ve birinden soğumuş fakat kimden maalesef belli değil. (Comprehension Question: Selin emlakçıyı mı kırmış?)
h. Selin telefonu kırmış ve birinden soğumuş fakat kimden maalesef belli değil. (Comprehension Question: Selin telefonu mu kırmış?)

15.
a. Seçil birinden saklanmış ve müdürden korkmuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)

b. Seçil birinden saklanmış ve yağmurdan korkmuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)
c. Seçil birinden saklanmış ve müdürü izlemiş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)
d. Seçil birinden saklanmış ve yağmuru izlemiş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)
e. Seçil müdürden korkmuş ve birinden saklanmış fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)
f. Seçil yağmurdan korkmuş ve birinden saklanmış fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)
g. Seçil müdürü izlemiş ve birinden saklanmış fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)
h. Seçil yağmuru izlemiş ve birinden saklanmış fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘asla’ kelimesi geçti mi?)

16.
a. Funda birinden çekinmiş ve avukattan sıkılmış fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
b. Funda birinden çekinmiş ve davadan sıkılmış fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
c. Funda birinden çekinmiş ve avukatı dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
d. Funda birinden çekinmiş ve davayı dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
e. Funda avukattan sıkılmış ve birinden çekinmiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
f. Funda davadan sıkılmış ve birinden çekinmiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
g. Funda avukatı dinlemiş ve birinden çekinmiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
h. Funda davayı dinlemiş ve birinden çekinmiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)

17.
a. Cengiz birine yalvarmış ve memura yaklaşmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)

b. Cengiz birine yalvarmış ve ekrana yaklaşmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)
c. Cengiz birine yalvarmış ve memurdan uzaklaşmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)
d. Cengiz birine yalvarmış ve ekrandan uzaklaşmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)
e. Cengiz memura yaklaşmış ve birine yalvarmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)
f. Cengiz ekrana yaklaşmış ve birine yalvarmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)
g. Cengiz memurdan uzaklaşmış ve birine yalvarmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)
h. Cengiz ekrandan uzaklaşmış ve birine yalvarmış ama kime henüz bilmiyoruz. (Comprehension Question: Yalvaran Cemil midir?)

18.
a. Fatih birine saldırmış ve şarkıcıya bağırmış ama kime şimdilik belli değil. (Comprehension Question: Fatih şarkıcıya mı bağırmış?)
b. Fatih birine saldırmış ve mikrofona bağırmış ama kime şimdilik belli değil. (Comprehension Question: Fatih mikrofona mı bağırmış?)
c. Fatih birine saldırmış ve şarkıcıdan kaçınmış ama kime şimdilik belli değil. (Comprehension Question: Fatih şarkıcıdan mı kaçınmış?)
d. Fatih birine saldırmış ve mikrofondan kaçınmış ama kime şimdilik belli değil. (Comprehension Question: Fatih mikrofondan mı kaçınmış?)
e. Fatih şarkıcıya bağırmış ve birine saldırmış ama kime şimdilik belli değil. (Comprehension Question: Fatih şarkıcıya mı bağırmış?)
f. Fatih mikrofona bağırmış ve birine saldırmış ama kime şimdilik belli değil. (Comprehension Question: Fatih mikrofona mı bağırmış?)
g. Fatih şarkıcıdan kaçınmış ve birine saldırmış ama kime şimdilik belli değil. (Comprehension Question: Fatih şarkıcıdan mı kaçınmış?)
h. Fatih mikrofondan kaçınmış ve birine saldırmış ama kime şimdilik belli değil. (Comprehension Question: Fatih mikrofondan mı kaçınmış?)

19.
a. Murat birine sarılmış ve mimara şaşırmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)
b. Murat birine sarılmış ve yemeğe şaşırmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)
c. Murat birine sarılmış ve mimardan kaçmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)
d. Murat birine sarılmış ve yemekten kaçmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)
e. Murat mimara şaşırmış ve birine sarılmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)
f. Murat yemeğe şaşırmış ve birine sarılmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)

g. Murat mimardan kaçmış ve birine sarılmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)
h. Murat yemekten kaçmış ve birine sarılmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘resmen’ kelimesi geçti mi?)

20.

a. Erdem birine kırılmış ve doktora kızmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
b. Erdem birine kırılmış ve sıcağa kızmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
c. Erdem birine kırılmış ve doktordan sıkılmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
d. Erdem birine kırılmış ve sıcaktan sıkılmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
e. Erdem doktora kızmış ve birine kırılmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
f. Erdem sıcağa kızmış ve birine kırılmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
g. Erdem doktordan sıkılmış ve birine kırılmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)
h. Erdem sıcaktan sıkılmış ve birine kırılmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘doğrusu’ kelimesi geçti mi?)

21.

a. Melis birine küsmüş ve savcıya gülmüş fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
b. Melis birine küsmüş ve şarkıya gülmüş fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
c. Melis birine küsmüş ve savcıyı aramış fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
d. Melis birine küsmüş ve şarkıyı aramış fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
e. Melis savcıya gülmüş ve birine küsmüş fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
f. Melis şarkıya gülmüş ve birine küsmüş fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
g. Melis savcıyı aramış ve birine küsmüş fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)
h. Melis şarkıyı aramış ve birine küsmüş fakat kime detaylı bilmiyoruz. (Comprehension Question: Küsen Melisa mıdır?)

22.
   a. Merve birine inanmış ve mühendise güvenmiş fakat kime vallahi belli değil. (Comprehension Question: Merve mühendise mi güvenmiş?)
   b. Merve birine inanmış ve aynaya güvenmiş fakat kime vallahi belli değil. (Comprehension Question: Merve aynaya mı güvenmiş?)
   c. Merve birine inanmış ve mühendisi saklamış fakat kime vallahi belli değil. (Comprehension Question: Merve mühendisi mi saklamış?)
   d. Merve birine inanmış ve aynayı saklamış fakat kime vallahi belli değil. (Comprehension Question: Merve aynayı mı saklamış?)
   e. Merve mühendise güvenmiş ve birine inanmış fakat kime vallahi belli değil. (Comprehension Question: Merve mühendise mi güvenmiş?)
   f. Merve aynaya güvenmiş ve birine inanmış fakat kime vallahi belli değil. (Comprehension Question: Merve aynaya mı güvenmiş?)
   g. Merve mühendisi saklamış ve birine inanmış fakat kime vallahi belli değil. (Comprehension Question: Merve mühendisi mi saklamış?)
   h. Merve aynayı saklamış ve birine inanmış fakat kime vallahi belli değil. (Comprehension Question: Merve aynayı mı saklamış?)

23.
   a. Cansu birine direnmiş ve aşçıya vurmuş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   b. Cansu birine direnmiş ve masaya vurmuş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   c. Cansu birine direnmiş ve aşçıyı görmüş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   d. Cansu birine direnmiş ve masayı görmüş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   e. Cansu aşçıya vurmuş ve birine direnmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   f. Cansu masaya vurmuş ve birine direnmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   g. Cansu aşçıyı görmüş ve birine direnmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)
   h. Cansu masayı görmüş ve birine direnmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘maalesef’ kelimesi geçti mi?)

24.
   a. Ezgi birine danışmış ve ressama ulaşmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
   b. Ezgi birine danışmış ve pakete ulaşmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)

c. Ezgi birine danışmış ve ressamı korumuş fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
d. Ezgi birine danışmış ve paketi korumuş fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
e. Ezgi ressama ulaşmış ve birine danışmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
f. Ezgi pakete ulaşmış ve birine danışmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
g. Ezgi ressamı korumuş ve birine danışmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?)
h. Ezgi paketi korumuş ve birine danışmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘ayrıntılı’ kelimesi geçti mi?

APPENDIX D

EXPERIMENTAL ITEMS FOR EXPERIMENT 2

1.
   a. Unembd, HighMorph, Distant: Mehmet birini ısrarla mühendisi görmeye çağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Çağıran Mahmut mudur?)
   b. Unembd, LowMorph, Distant: Mehmet birini ısrarla mühendise vurmaya çağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Çağıran Mahmut mudur?)
   c. Embd, HighMorph, Distant: Mehmet birini görmeye mühendisi ısrarla çağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Çağıran Mahmut mudur?)
   d. Embd, LowMorph, Distant: Mehmet birini gördüğünü mühendise ısrarla açıklamış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Açıklayan Mahmut mudur?)
   e. Unembd, HighMorph, Recent: Mehmet mühendisi görmeye birini ısrarla çağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Çağıran Mahmut mudur?)
   f. Unembd, LowMorph, Recent: Mehmet mühendise vurmaya birini ısrarla çağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Çağıran Mahmut mudur?)
   g. Embd, HighMorph, Recent: Mehmet mühendisi ısrarla birini görmeye çağırmış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Çağıran Mahmut mudur?)
   h. Embd, LowMorph, Recent: Mehmet mühendise ısrarla birini gördüğünü açıklamış ama kimi gerçekten bilmiyoruz. (Comprehension Question: Açıklayan Mahmut mudur?)
2.
   a. Hasan birini dün şarkıcıyı korumaya zorlamış ama kimi maalesef belli değil. (Comprehension Question: Zorlayan Hasan mıdır?)
   b. Hasan birini dün şarkıcıya güvenmeye zorlamış ama kimi maalesef belli değil. (Comprehension Question: Zorlayan Hasan mıdır?)
   c. Hasan birini korumaya şarkıcıyı dün zorlamış ama kimi maalesef belli değil. (Comprehension Question: Zorlayan Hasan mıdır?)
   d. Hasan birini koruduğunu şarkıcıya dün bildirmiş ama kimi maalesef belli değil. (Comprehension Question: Bildiren Hasan mıdır?)
   e. Hasan şarkıcıyı korumaya birini dün zorlamış ama kimi maalesef belli değil. (Comprehension Question: Zorlayan Hasan mıdır?)
   f. Hasan şarkıcıya güvenmeye birini dün zorlamış ama kimi maalesef belli değil. (Comprehension Question: Zorlayan Hasan mıdır?)
   g. Hasan şarkıcıyı dün birini korumaya zorlamış ama kimi maalesef belli değil. (Comprehension Question: Zorlayan Hasan mıdır?)
   h. Hasan şarkıcıya dün birini koruduğunu bildirmiş ama kimi maalesef belli değil. (Comprehension Question: Bildiren Hasan mıdır?)

3.
   a. Yusuf birini zorla müzisyeni saklamaya yöneltmiş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   b. Yusuf birini zorla müzisyene yaklaşmaya yöneltmiş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   c. Yusuf birini saklamaya müzisyeni zorla yöneltmiş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   d. Yusuf birini sakladığını müzisyene zorla anlatmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   e. Yusuf müzisyeni saklamaya birini zorla yöneltmiş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   f. Yusuf müzisyene yaklaşmaya birini zorla yöneltmiş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   g. Yusuf müzisyeni zorla birini saklamaya yöneltmiş ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
   h. Yusuf müzisyene zorla birini sakladığını anlatmış ama kimi cidden anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘kısmen’ kelimesi geçti mi?)
4.
   a. Osman birini sanırım doktoru kırmaya zorlamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   b. Osman birini sanırım doktora kızmaya zorlamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   c. Osman birini kırmaya doktoru sanırım zorlamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   d. Osman birini kırdığını doktora sanırım aktarmış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   e. Osman doktoru kırmaya birini sanırım zorlamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   f. Osman doktora kızmaya birini sanırım zorlamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   g. Osman doktoru sanırım birini kırmaya zorlamış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
   h. Osman doktora sanırım birini kırdığını aktarmış ama kimi henüz öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)

5.
   a. Zeynep birini bugün komşuyu izlemeye çağırmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Çağıran Ziynet midir?)
   b. Zeynep birini bugün komşudan kurtulmaya çağırmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Çağıran Ziynet midir?)
   c. Zeynep birini izlemeye komşuyu bugün çağırmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Çağıran Ziynet midir?)
   d. Zeynep birini izlediğini komşudan bugün duymuş fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Duyan Ziynet midir?)
   e. Zeynep komşuyu izlemeye birini bugün çağırmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Çağıran Ziynet midir?)
   f. Zeynep komşudan kurtulmaya birini bugün çağırmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Çağıran Ziynet midir?)
   g. Zeynep komşuyu bugün birini izlemeye çağırmış fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Çağıran Ziynet midir?)
   h. Zeynep komşudan bugün birini izlediğini duymuş fakat kimi kesinlikle bilmiyoruz. (Comprehension Question: Duyan Ziynet midir?)

6.
   a. Defne birini galiba oyuncuyu aramaya göndermiş fakat kimi şimdilik belli değil. (Comprehension Question: Gönderen Defne midir?)
   b. Defne birini galiba oyuncudan gizlenmeye göndermiş fakat kimi şimdilik belli değil. (Comprehension Question: Gönderen Defne midir?)
   c. Defne birini aramaya oyuncuyu galiba göndermiş fakat kimi şimdilik belli değil. (Comprehension Question: Gönderen Defne midir?)
   d. Defne birini aradığını oyuncudan galiba öğrenmiş fakat kimi şimdilik belli değil. (Comprehension Question: Öğrenen Defne midir?)
   e. Defne oyuncuyu aramaya birini galiba göndermiş fakat kimi şimdilik belli değil. (Comprehension Question: Gönderen Defne midir?)
   f. Defne oyuncudan gizlenmeye birini galiba göndermiş fakat kimi şimdilik belli değil. (Comprehension Question: Gönderen Defne midir?)
   g. Defne oyuncuyu galiba birini aramaya göndermiş fakat kimi şimdilik belli değil. (Comprehension Question: Gönderen Defne midir?)
   h. Defne oyuncudan galiba birini aradığını öğrenmiş fakat kimi şimdilik belli değil. (Comprehension Question: Öğrenen Defne midir?)

7.
   a. Fatma birini herhalde pilotu dinlemeye yöneltmiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)
   b. Fatma birini herhalde pilottan sıkılmaya yöneltmiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)
   c. Fatma birini dinlemeye pilotu herhalde yöneltmiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)
   d. Fatma birini dinlediğini pilottan herhalde gizlemiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)
   e. Fatma pilotu dinlemeye birini herhalde yöneltmiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)

f. Fatma pilottan sıkılmaya birini herhalde yöneltmiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)
g. Fatma pilotu herhalde birini dinlemeye yöneltmiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)
h. Fatma pilottan herhalde birini dinlediğini gizlemiş fakat kimi açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘gizlice’ kelimesi geçti mi?)

8.
a. Doğa birini cidden garsonu susturmaya göndermiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
b. Doğa birini cidden garsondan yararlanmaya göndermiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
c. Doğa birini susturmaya garsonu cidden göndermiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
d. Doğa birini susturduğunu garsondan cidden dinlemiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
e. Doğa garsonu susturmaya birini cidden göndermiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
f. Doğa garsondan yararlanmaya birini cidden göndermiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
g. Doğa garsonu cidden birini susturmaya göndermiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)
h. Doğa garsondan cidden birini susturduğunu dinlemiş fakat kimi vallahi öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘cidden’ kelimesi geçti mi?)

9.
a. Ömer birinden mecburen savcıdan bıktığını gizlemiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Gizleyen Özer midir?)
b. Ömer birinden mecburen savcıya güldüğünü gizlemiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Gizleyen Özer midir?)
c. Ömer birinden bıktığını savcıdan mecburen gizlemiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Gizleyen Özer midir?)
d. Ömer birinden bıktığını savcıya mecburen belirtmiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Belirten Özer midir?)
e. Ömer savcıdan bıktığını birinden mecburen gizlemiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Gizleyen Özer midir?)
f. Ömer savcıya güldüğünü birinden mecburen gizlemiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Gizleyen Özer midir?)
g. Ömer savcıdan mecburen birinden bıktığını gizlemiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Gizleyen Özer midir?)

h. Ömer savcıya mecburen birinden bıktığını belirtmiş ama kimden detaylı bilmiyoruz. (Comprehension Question: Belirten Özer midir?)

10.
a. Emre birinden şimdilik müdürden uzaklaştığını saklamış ama kimden doğrusu belli değil. (Comprehension Question: Saklayan Emre midir?)
b. Emre birinden şimdilik müdüre bağırdığını saklamış ama kimden doğrusu belli değil. (Comprehension Question: Saklayan Emre midir?)
c. Emre birinden uzaklaştığını müdürden şimdilik saklamış ama kimden doğrusu belli değil. (Comprehension Question: Saklayan Emre midir?)
d. Emre birinden uzaklaştığını müdüre şimdilik göstermiş ama kimden doğrusu belli değil. (Comprehension Question: Gösteren Emre midir?)
e. Emre müdürden uzaklaştığını birinden şimdilik saklamış ama kimden doğrusu belli değil. (Comprehension Question: Saklayan Emre midir?)
f. Emre müdüre bağırdığını birinden şimdilik saklamış ama kimden doğrusu belli değil. (Comprehension Question: Saklayan Emre midir?)
g. Emre müdürden şimdilik birinden uzaklaştığını saklamış ama kimden doğrusu belli değil. (Comprehension Question: Saklayan Emre midir?)
h. Emre müdüre şimdilik birinden uzaklaştığını göstermiş ama kimden doğrusu belli değil. (Comprehension Question: Gösteren Emre midir?)

11.
a. Hakan birinden çoktan ressamdan kurtulduğunu öğrenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
b. Hakan birinden çoktan ressama kavuştuğunu öğrenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
c. Hakan birinden kurtulduğunu ressamdan çoktan öğrenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
d. Hakan birinden kurtulduğunu ressama çoktan bildirmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
e. Hakan ressamdan kurtulduğunu birinden çoktan öğrenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
f. Hakan ressama kavuştuğunu birinden çoktan öğrenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
g. Hakan ressamdan çoktan birinden kurtulduğunu öğrenmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)
h. Hakan ressama çoktan birinden kurtulduğunu bildirmiş ama kimden aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘henüz’ kelimesi geçti mi?)

12.
a. Furkan birinden eskiden şairden bunaldığını duymuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)

b. Furkan birinden eskiden şaire ulaştığını duymuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)
c. Furkan birinden bunaldığını şairden eskiden duymuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)
d. Furkan birinden bunaldığını şaire eskiden aktarmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)
e. Furkan şairden bunaldığını birinden eskiden duymuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)
f. Furkan şaire ulaştığını birinden eskiden duymuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)
g. Furkan şairden eskiden birinden bunaldığını duymuş ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)
h. Furkan şaire eskiden birinden bunaldığını aktarmış ama kimden ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘eskiden’ kelimesi geçti mi?)

13.
a. Alev birinden saatlerce bakıcıdan kaçındığını dinlemiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Dinleyen Ayşe midir?)
b. Alev birinden saatlerce bakıcıyı izlediğini dinlemiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Dinleyen Ayşe midir?)
c. Alev birinden kaçındığını bakıcıdan saatlerce dinlemiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Dinleyen Ayşe midir?)
d. Alev birinden kaçınmaya bakıcıyı saatlerce zorlamış fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Zorlayan Ayşe midir?)
e. Alev bakıcıdan kaçındığını birinden saatlerce dinlemiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Dinleyen Ayşe midir?)
f. Alev bakıcıyı izlediğini birinden saatlerce dinlemiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Dinleyen Ayşe midir?)
g. Alev bakıcıdan saatlerce birinden kaçındığını dinlemiş fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Dinleyen Ayşe midir?)
h. Alev bakıcıyı saatlerce birinden kaçınmaya zorlamış fakat kimden gerçekten bilmiyoruz. (Comprehension Question: Zorlayan Ayşe midir?)

14.
a. Nilay birinden gizlice patrondan kaçtığını öğrenmiş fakat kimden maalesef belli değil. (Comprehension Question: Öğrenen Nilay mıdır?)
b. Nilay birinden gizlice patronu kırdığını öğrenmiş fakat kimden maalesef belli değil. (Comprehension Question: Öğrenen Nilay mıdır?)
c. Nilay birinden kaçtığını patrondan gizlice öğrenmiş fakat kimden maalesef belli değil. (Comprehension Question: Öğrenen Nilay mıdır?)
d. Nilay birinden kaçmaya patronu gizlice çağırmış fakat kimden maalesef belli değil. (Comprehension Question: Çağıran Nilay mıdır?)
e. Nilay patrondan kaçtığını birinden gizlice öğrenmiş fakat kimden maalesef belli değil. (Comprehension Question: Öğrenen Nilay mıdır?)

f. Nilay patronu kırdığını birinden gizlice öğrenmiş fakat kimden maalesef belli değil. (Comprehension Question: Öğrenen Nilay mıdır?)
g. Nilay patrondan gizlice birinden kaçtığını öğrenmiş fakat kimden maalesef belli değil. (Comprehension Question: Öğrenen Nilay mıdır?)
h. Nilay patronu gizlice birinden kaçmaya çağırmış fakat kimden maalesef belli değil. (Comprehension Question: Çağıran Nilay mıdır?)

15.
a. Filiz birinden artık hastadan sıkıldığını duymuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
b. Filiz birinden artık hastayı dinlediğini duymuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
c. Filiz birinden sıkıldığını hastadan artık duymuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
d. Filiz birinden sıkılmaya hastayı artık yöneltmiş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
e. Filiz hastadan sıkıldığını birinden artık duymuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
f. Filiz hastayı dinlediğini birinden artık duymuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
g. Filiz hastadan artık birinden sıkıldığını duymuş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)
h. Filiz hastayı artık birinden sıkılmaya yöneltmiş fakat kimden kesinlikle anlamadık. (Comprehension Question: Okuduğunuz cümlede 'sonunda' kelimesi geçti mi?)

16.
a. Mine birinden gerçekten aşçıdan korktuğunu dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)
b. Mine birinden gerçekten aşçıyı korkuttuğunu dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)
c. Mine birinden korktuğunu aşçıdan gerçekten dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)
d. Mine birinden korkmaya aşçıyı gerçekten yöneltmiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)
e. Mine aşçıdan korktuğunu birinden gerçekten dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)
f. Mine aşçıyı korkuttuğunu birinden gerçekten dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)

g. Mine aşçıdan gerçekten birinden korktuğunu dinlemiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘gerçekten’ kelimesi geçti mi?)
h. Mine aşçıyı gerçekten birinden korkmaya yöneltmiş fakat kimden cidden öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘gerçekten’ kelimesi geçti mi?)

17.

a. Enes birine defalarca mimara güvendiğini açıklamış ama kime henüz bilmiyoruz. (Comprehension Question: Açıklayan Eren midir?)
b. Enes birine defalarca mimardan kaçtığını açıklamış ama kime henüz bilmiyoruz. (Comprehension Question: Açıklayan Eren midir?)
c. Enes birine güvendiğini mimara defalarca açıklamış ama kime henüz bilmiyoruz. (Comprehension Question: Açıklayan Eren midir?)
d. Enes birine güvendiğini mimardan defalarca duymuş ama kime henüz bilmiyoruz. (Comprehension Question: Duyan Eren midir?)
e. Enes mimara güvendiğini birine defalarca açıklamış ama kime henüz bilmiyoruz. (Comprehension Question: Açıklayan Eren midir?)
f. Enes mimardan kaçtığını birine defalarca açıklamış ama kime henüz bilmiyoruz. (Comprehension Question: Açıklayan Eren midir?)
g. Enes mimara defalarca birine güvendiğini açıklamış ama kime henüz bilmiyoruz. (Comprehension Question: Açıklayan Eren midir?)
h. Enes mimardan defalarca birine güvendiğini duymuş ama kime henüz bilmiyoruz. (Comprehension Question: Duyan Eren midir?)

18.

a. Metin birine yanlışlıkla tamirciye bağırdığını bildirmiş ama kime şimdilik belli değil. (Comprehension Question: Bildiren Metin midir?)
b. Metin birine yanlışlıkla tamirciden uzaklaştığını bildirmiş ama kime şimdilik belli değil. (Comprehension Question: Bildiren Metin midir?)
c. Metin birine bağırdığını tamirciye yanlışlıkla bildirmiş ama kime şimdilik belli değil. (Comprehension Question: Bildiren Metin midir?)
d. Metin birine bağırdığını tamirciden yanlışlıkla öğrenmiş ama kime şimdilik belli değil. (Comprehension Question: Öğrenen Metin midir?)
e. Metin tamirciye bağırdığını birine yanlışlıkla bildirmiş ama kime şimdilik belli değil. (Comprehension Question: Bildiren Metin midir?)
f. Metin tamirciden uzaklaştığını birine yanlışlıkla bildirmiş ama kime şimdilik belli değil. (Comprehension Question: Bildiren Metin midir?)
g. Metin tamirciye yanlışlıkla birine bağırdığını bildirmiş ama kime şimdilik belli değil. (Comprehension Question: Bildiren Metin midir?)
h. Metin tamirciden yanlışlıkla birine bağırdığını öğrenmiş ama kime şimdilik belli değil. (Comprehension Question: Öğrenen Metin midir?)

19.

a. Halil birine nedense memura yaklaştığını anlatmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)
b. Halil birine nedense memurdan kaçındığını anlatmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)

c. Halil birine yaklaştığını memura nedense anlatmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)
d. Halil birine yaklaştığını memurdan nedense dinlemiş ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)
e. Halil memura yaklaştığını birine nedense anlatmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)
f. Halil memurdan kaçındığını birine nedense anlatmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)
g. Halil memura nedense birine yaklaştığını anlatmış ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)
h. Halil memurdan nedense birine yaklaştığını dinlemiş ama kime açıkçası anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘nasılsa’ kelimesi geçti mi?)

20.
a. Mahmut birine kazara avukata vurduğunu aktarmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
b. Mahmut birine kazara avukattan saklandığını aktarmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
c. Mahmut birine vurduğunu avukata kazara aktarmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
d. Mahmut birine vurduğunu avukattan kazara saklamış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
e. Mahmut avukata vurduğunu birine kazara aktarmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
f. Mahmut avukattan saklandığını birine kazara aktarmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
g. Mahmut avukata kazara birine vurduğunu aktarmış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)
h. Mahmut avukattan kazara birine vurduğunu saklamış ama kime doğrusu öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘kazara’ kelimesi geçti mi?)

21.
a. Arzu birine kasten senariste danıştığını belirtmiş fakat kime detaylı bilmiyoruz. (Comprehension Question: Belirten Ahu mudur?)
b. Arzu birine kasten senaristi gördüğünü belirtmiş fakat kime detaylı bilmiyoruz. (Comprehension Question: Belirten Ahu mudur?)
c. Arzu birine danıştığını senariste kasten belirtmiş fakat kime detaylı bilmiyoruz. (Comprehension Question: Belirten Ahu mudur?)

d. Arzu birine danışmaya senaristi kasten çağırmış fakat kime detaylı bilmiyoruz. (Comprehension Question: Çağıran Ahu mudur?)
e. Arzu senariste danıştığını birine kasten belirtmiş fakat kime detaylı bilmiyoruz. (Comprehension Question: Belirten Ahu mudur?)
f. Arzu senaristi gördüğünü birine kasten belirtmiş fakat kime detaylı bilmiyoruz. (Comprehension Question: Belirten Ahu mudur?)
g. Arzu senariste kasten birine danıştığını belirtmiş fakat kime detaylı bilmiyoruz. (Comprehension Question: Belirten Ahu mudur?)
h. Arzu senaristi kasten birine danışmaya çağırmış fakat kime detaylı bilmiyoruz. (Comprehension Question: Çağıran Ahu mudur?)

22.
a. Nihal birine yine asistana kızdığını göstermiş fakat kime vallahi belli değil. (Comprehension Question: Gösteren Nihal midir?)
b. Nihal birine yine asistanı koruduğunu göstermiş fakat kime vallahi belli değil. (Comprehension Question: Gösteren Nihal midir?)
c. Nihal birine kızdığını asistana yine göstermiş fakat kime vallahi belli değil. (Comprehension Question: Gösteren Nihal midir?)
d. Nihal birine kızmaya asistanı yine göndermiş fakat kime vallahi belli değil. (Comprehension Question: Gönderen Nihal midir?)
e. Nihal asistana kızdığını birine yine göstermiş fakat kime vallahi belli değil. (Comprehension Question: Gösteren Nihal midir?)
f. Nihal asistanı koruduğunu birine yine göstermiş fakat kime vallahi belli değil. (Comprehension Question: Gösteren Nihal midir?)
g. Nihal asistana yine birine kızdığını göstermiş fakat kime vallahi belli değil. (Comprehension Question: Gösteren Nihal midir?)
h. Nihal asistanı yine birine kızmaya göndermiş fakat kime vallahi belli değil. (Comprehension Question: Gönderen Nihal midir?)

23.
a. Pınar birine sonunda yazara kavuştuğunu bildirmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)
b. Pınar birine sonunda yazarı sakladığını bildirmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)
c. Pınar birine kavuştuğunu yazara sonunda bildirmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)
d. Pınar birine kavuşmaya yazarı sonunda zorlamış fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)
e. Pınar yazara kavuştuğunu birine sonunda bildirmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)
f. Pınar yazarı sakladığını birine sonunda bildirmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)
g. Pınar yazara sonunda birine kavuştuğunu bildirmiş fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)

h. Pınar yazarı sonunda birine kavuşmaya zorlamış fakat kime aslında anlamadık. (Comprehension Question: Okuduğunuz cümlede ‘artık’ kelimesi geçti mi?)

24.

a. Elvan birine nihayet kaptana ulaştığını aktarmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
b. Elvan birine nihayet kaptanı aradığını aktarmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
c. Elvan birine ulaştığını kaptana nihayet aktarmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
d. Elvan birine ulaşmaya kaptanı nihayet göndermiş fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
e. Elvan kaptana ulaştığını birine nihayet aktarmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
f. Elvan kaptanı aradığını birine nihayet aktarmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
g. Elvan kaptana nihayet birine ulaştığını aktarmış fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)
h. Elvan kaptanı nihayet birine ulaşmaya göndermiş fakat kime ayrıntılı öğrenemedik. (Comprehension Question: Okuduğunuz cümlede ‘nihayet’ kelimesi geçti mi?)

APPENDIX E

FILLER AND PRACTICE ITEMS FOR EXPERIMENTS 1 AND 2

E.1 Filler Sentences and Comprehension Questions:

1. Yasemin arabada uyumuş ve bir şeye sinirlenmiş ama neye sinirlenmiş gerçekten bilmiyoruz. (Comprehension Question: Yasemin uçakta mı uyumuş?)
2. Sevgi koridorda koşmuş ve birine çarpmış ama kime çarpmış maalesef belli değil. (Comprehension Question: Sevgi koridorda mı koşmuş?)
3. Şeyma yola atlamış ve biriyle karşılaşmış ama kimle karşılaşmış cidden emin değiliz. (Comprehension Question: Şeyma kaldırıma mı atlamış?)
4. Ceren dışarı yürümüş ve birine seslenmiş ama kime seslenmiş henüz bilgimiz yok. (Comprehension Question: Yürüyen Ceren midir?)
5. Şirin yere oturmuş ve birini çekiştirmiş fakat kimi çekiştirmiş kesinlikle bilmiyoruz. (Comprehension Question: Oturan Şermin midir?)
6. Gamze çok yorulmuş ve birine yakınmış fakat kime yakınmış şimdilik belli değil. (Comprehension Question: Gamze çok mu yorulmuş?)
7. Barış ayağa kalkmış ve birini düşürmüş ama kimi düşürmüş gerçekten bilmiyoruz. (Comprehension Question: Barış amuda mı kalkmış?)
8. Kaan birinde kalmış ve orada sabahlamış ama kimde kalmış maalesef belli değil. (Comprehension Question: Kaan sabahlamış mı?)
9. Uğur birinden kopmuş ve telefona sarılmış ama kimden kopmuş kesinlikle emin değiliz. (Comprehension Question: Uğur tablete mi sarılmış?)
10. Cem bir şeyden tırsmış ve karakola sığınmış ama neyden tırsmış cidden bilgimiz yok. (Comprehension Question: Cem karakola mı sığınmış?)
11. Volkan birini bezdirmiş ve pişman olmuş fakat kimi bezdirmiş henüz bilmiyoruz. (Comprehension Question: Volkan memnun mu olmuş?)
12. Selim birini sevindirmiş ve mutlu olmuş fakat kimi sevindirmiş şimdilik belli değil. (Comprehension Question: Selim mutlu mu olmuş?)
13. Derya birinden fırtınanın iyice güçlendiğini işitmiş fakat kimden işitmiş gerçekten bilmiyoruz. (Comprehension Question: Fırtına iyice azalmış mı?)
14. Bengü birinden sporcunun fazla zayıfladığını öğrenmiş fakat kimden öğrenmiş maalesef belli değil. (Comprehension Question: Sporcu fazla mı zayıflamış?)
15. Belgin birinden şirketin oldukça büyüdüğünü duymuş fakat kimden duymuş kesinlikle emin değiliz. (Comprehension Question: Şirket oldukça küçülmüş mü?)
16. İdil birine öğrencilerin çok zor ayıldığını açıklamış ama kime açıklamış henüz bilmiyoruz. (Comprehension Question: Açıklayan İdil midir?)
17. Sibel birine annesinin aniden bayıldığını söylemiş ama kime söylemiş şimdilik belli değil. (Comprehension Question: Söyleyen Sinem midir?)
18. Sumru birinden ülkenin çok geliştiğini işitmiş fakat kimden işitmiş cidden bilgimiz yok. (Comprehension Question: İşiten Sumru mudur?)
19. Hüseyin hocanın kötü hissettiğini birinden işitmiş fakat kimden işitmiş gerçekten bilmiyoruz. (Comprehension Question: Hoca iyi mi hissetmiş?)

20. Umut çocuğun çok susadığını birinden öğrenmiş fakat kimden öğrenmiş maalesef belli değil. (Comprehension Question: Çocuk çok mu susamış?)
21. Arda ekibin iyice acıktığını birinden duymuş fakat kimden duymuş kesinlikle emin değiliz. (Comprehension Question: Duyan Aras mıdır?)
22. Cihan köpeğin mutfakta gezdiğini birinden işitmiş fakat kimden işitmiş cidden bilgimiz yok. (Comprehension Question: İşiten Cihan mıdır?)
23. Ege mankenin güneşten yandığını birine açıklamış ama kime açıklamış henüz bilmiyoruz. (Comprehension Question: Oyuncu mu güneşten yanmış?)
24. Emir simitçinin sıcaktan kavrulduğunu birine söylemiş ama kime söylemiş şimdilik belli değil. (Comprehension Question: Simitçi mi sıcaktan kavrulmuş?)
25. Aylin görevliye söylemeden bir yere gitmiş ama neden gerçekten bilmiyoruz. (Comprehension Question: Giden Aynur mudur?)
26. Bahar üzerine denemeden bir pantolon satın almış ama nasıl maalesef belli değil. (Comprehension Question: Bahar pantolon mu satın almış?)
27. Çiğdem parasını vermeden bir yemek yemiş ama niçin cidden emin değiliz. (Comprehension Question: Çiğdem yemek mi yapmış?)
28. Dilara evdekilere haber vermeden bir otelde kalmış ama ne zaman henüz bilgimiz yok. (Comprehension Question: Dilara otelde mi kalmış?)
29. Elifnur üniversiteyi kazanıp bir ev kiralamış fakat nerede kesinlikle bilmiyoruz. (Comprehension Question: Elifnur bir ev mi satın almış?)
30. Kumsal balkona çıkıp bir arkadaşını gözetlemiş fakat niçin şimdilik belli değil. (Comprehension Question: Gözetleyen Kumsal mıdır?)
31. Alper işten izin alıp bir çocuğa bakmış fakat nasıl gerçekten bilmiyoruz. (Comprehension Question: Alper bir bebeğe mi bakmış?)
32. Baran bir dostunu dolandırıp telefonunu engellemiş fakat neden maalesef belli değil. (Comprehension Question: Dolandıran Baran mıdır?)
33. Cemal bir amcasıyla küsüp ailesinden gizlemiş fakat niçin kesinlikle emin değiliz. (Comprehension Question: Gizleyen Cemil midir?)
34. Devrim bir akrabasıyla barışıp ablasına söylememiş fakat ne zaman cidden bilgimiz yok. (Comprehension Question: Barışan Devrim midir?)
35. Emrah bir komşusuyla tartışıp yöneticiyi reddetmiş ama nerede henüz bilmiyoruz. (Comprehension Question: Emrah yöneticiyle mi tartışmış?)
36. Fikret bir çiçeği koparıp vazoya koymuş ama ne zaman şimdilik belli değil. (Comprehension Question: Fikret bir çiçeği mi koparmış?)
37. Müge birini restorana çağırıp yemek ısmarlamış ama nerede gerçekten bilmiyoruz. (Comprehension Question: Yemek ısmarlayan Mine midir?)
38. Nisan birini eve davet edip kahve ikram etmiş ama ne zaman maalesef belli değil. (Comprehension Question: Nisan kahve mi ikram etmiş?)
39. Nalan birini polise teslim edip mahkemeye vermiş ama niçin cidden emin değiliz. (Comprehension Question: Okuduğunuz cümlede 'gerçekten' kelimesi geçti mi?)
40. Didem birini suçüstü yakalayıp hapse attırmış ama nerede henüz bilgimiz yok. (Comprehension Question: Okuduğunuz cümlede 'henüz' kelimesi geçti mi?)
41. Rana sırayı bozup birini mağdur etmiş fakat neden kesinlikle bilmiyoruz. (Comprehension Question: Sırayı bozan Rüya mıdır?)
42. Sezen sürpriz yapıp birini mutlu etmiş fakat nasıl şimdilik belli değil. (Comprehension Question: Sürpriz yapan Sezen midir?)

43. Mazhar parasız kalıp birine mahcup olmuş fakat nasıl gerçekten bilmiyoruz. (Comprehension Question: Mazhar uykusuz mu kalmış?)
44. Nihat haline üzülüp birine para vermiş fakat ne zaman maalesef belli değil. (Comprehension Question: Okuduğunuz cümlede 'maalesef' kelimesi geçti mi?)
45. Orhan gerçeği gizleyip birine yalan söylemiş fakat niçin kesinlikle emin değiliz. (Comprehension Question: Gerçeği gizleyen Osman mıdır?)
46. Poyraz cüzdanı çalıp birine iftira atmış fakat ne zaman cidden bilgimiz yok. (Comprehension Question: Cüzdanı çalan Poyraz mıdır?)
47. Rıza birinden umudu kesip şehirden gitmiş ama nereye henüz bilmiyoruz. (Comprehension Question: Rıza şehirde mi kalmış?)
48. Selçuk bir şeye aşırı kızıp yüzüğü çöpe atmış ama neye şimdilik belli değil. (Comprehension Question: Selçuk yüzüğü çöpe mi atmış?

E.2 Practice Sentences and Comprehension Questions:

1. Ebru kapıya çıkmış ve birini karşılamış fakat kimi karşılamış açıkçası emin değiliz. (Comprehension Question: Ebru kapıya mı çıkmış?)
2. Melek okula gelmiş ve birinden gizlenmiş ama kimden gizlenmiş detaylı bilmiyoruz. (Comprehension Question: Melek eve mi gelmiş?)
3. Onur bir şey istemiş ve salonu terk etmiş fakat ne istemiş açıkçası emin değiliz. (Comprehension Question: Onur salonu mu terk etmiş?)
4. Eren birine kanmış ve düğünü iptal etmiş fakat kime kanmış doğrusu bilgimiz yok. (Comprehension Question: Eren nişanı mı iptal etmiş?)
5. Gözde sessizce konuşmuş ve birine gülümsemiş ama kime gülümsemiş ayrıntılı öğrenemedik. (Comprehension Question: Konuşan Gözde midir?)

APPENDIX F

EXPERIMENTAL AND FILLER ITEMS FOR EXPERIMENT 3

F.1 Experimental sentences:

1. a. Linear Distance: Umut bir öğrenciyi sevmiş ve bir profesörü görmüş ama kimi _____ gerçekten bilmiyoruz.
   Answer 1: Sevmiş Answer 2: Görmüş

   b. Syntactic Distance: Umut bir öğrenciyi ısrarla bir profesörü görmeye çağırmış ama kimi _____ gerçekten bilmiyoruz.
   Answer 1: Görmeye Answer 2: Çağırmış

2. a. Serkan bir besteciyi tanımış ve bir müzisyeni bulmuş ama kimi _____ cidden anlamadık.
   Answer 1: Bulmuş Answer 2: Tanımış

   b. Serkan bir besteciyi zorla bir müzisyeni bulmaya göndermiş ama kimi _____ cidden anlamadık.
   Answer 1: Göndermiş Answer 2: Bulmaya

3. a. Bahar bir muhabire yalvarmış ve bir oyuncuya yaklaşmış fakat kime _____ kesinlikle bilmiyoruz.
   Answer 1: Yalvarmış Answer 2: Yaklaşmış

   b. Bahar bir muhabire mecburen bir oyuncuya yaklaştığını açıklamış fakat kime _____ kesinlikle bilmiyoruz.
   Answer 1: Yaklaştığını Answer 2: Açıklamış

4. a. Çiğdem bir teyzeye inanmış ve bir gezgine kızmış fakat kime _____ açıkçası anlamadık.
   Answer 1: Kızmış Answer 2: İnanmış

   b. Çiğdem bir teyzeye utançla bir gezgine kızdığını anlatmış fakat kime _____ açıkçası anlamadık.
   Answer 1: Anlatmış Answer 2: Kızdığını

5. a. Cihan bir öğretmenden kaçmış ve bir kursiyerden soğumuş ama kimden _____ detaylı bilmiyoruz.
   Answer 1: Kaçmış Answer 2: Soğumuş

   b. Cihan bir öğretmenden özellikle bir kursiyerden soğuduğunu gizlemiş ama kimden _____ detaylı bilmiyoruz.
   Answer 1: Soğuduğunu Answer 2: Gizlemiş

6. a. Ege bir tasarımcıdan bunalmış ve bir ressamdan hoşlanmış ama kimden _____ aslında anlamadık.
   Answer 1: Hoşlanmış Answer 2: Bunalmış

   b. Ege bir kursiyerden çoktandır bir ressamdan hoşlandığını öğrenmiş ama kimden _____ aslında anlamadık.

Answer 1: Öğrenmiş Answer 2: Hoşlandığını

7. a. Lale bir öğrenciye ulaşmış ve bir psikoloğa başvurmuş fakat kime _____ gerçekten bilmiyoruz.
   Answer 1: Ulaşmış Answer 2: Başvurmuş

   b. Lale bir öğrenciye esasen bir psikoloğa başvurduğunu belirtmiş fakat kime _____ gerçekten bilmiyoruz.
   Answer 1: Başvurduğunu Answer 2: Belirtmiş

8. a. Hazal bir ustaya rastlamış ve bir işçiye çarpmış fakat kime _____ kesinlikle anlamadık.
   Answer 1: Çarpmış Answer 2: Rastlamış

   b. Hazal bir ustaya kazara bir işçiye çarptığını bildirmiş fakat kime _____ kesinlikle anlamadık.
   Answer 1: Bildirmiş Answer 2: Çarptığını

9. a. Taner bir mimardan utanmış ve bir müdürden uzaklaşmış ama kimden _____ henüz bilmiyoruz.
   Answer 1: Utanmış Answer 2: Uzaklaşmış

   b. Taner bir mimardan şimdilik bir müdürden uzaklaştığını dinlemiş ama kimden _____ henüz bilmiyoruz.
   Answer 1: Uzaklaştığını Answer 2: Dinlemiş

10. a. Tarık bir hakimden çekinmiş ve bir memurdan korkmuş ama kimden _____ açıkçası anlamadık.
    Answer 1: Korkmuş Answer 2: Çekinmiş

    b. Tarık bir hakimden nedense bir memurdan korktuğunu duymuş ama kimden _____ açıkçası anlamadık.
    Answer 1: Duymuş Answer 2: Korktuğunu

11. a. Melis bir çizeri beklemiş ve bir senaristi izlemiş fakat kimi _____ detaylı bilmiyoruz.
    Answer 1: Beklemiş Answer 2: İzlemiş

    b. Melis bir çizeri sessizce bir senaristi izlemeye yöneltmiş fakat kimi _____ detaylı bilmiyoruz.
    Answer 1: İzlemeye Answer 2: Yöneltmiş

12. a. Cansu bir çalışanı beğenmiş ve bir görevliyi incelemiş fakat kimi _____ aslında anlamadık.
    Answer 1: İncelemiş Answer 2: Beğenmiş

    b. Cansu bir çalışanı bugün bir görevliyi incelemeye göndermiş fakat kimi _____ aslında anlamadık.
    Answer 1: Göndermiş Answer 2: İncelemeye

F.2 Filler sentences:

1. Yusuf bir mühendisi ısrarla bir müteahhiti aramaya çağırmış. Salih de bir yöneticiyi _____.

Answer 1: Aramaya Answer 2: Çağırmış

2. Osman bir kameramanı dün bir editörü kandırmaya yöneltmiş. Tanju da bir sunucuyu _____.
   Answer 1: Yöneltmiş Answer 2: Kandırmaya

3. Nalan bir personele zorla bir hastaya danıştığını bildirmiş. Ece de bir dostuna _____.
   Answer 1: Danıştığını Answer 2: Bildirmiş

4. Didem bir doktora sanırım bir hemşireye güvendiğini aktarmış. Mehmet de bir meslektaşına _____.
   Answer 1: Aktarmış Answer 2: Güvendiğini

5. Emrah bir yazardan mecburen bir şairden kurtulduğunu saklamış. Mustafa da bir yayıncıdan _____.
   Answer 1: Kurtulduğunu Answer 2: Saklamış

6. Fikret bir tesisatçıdan galiba bir boyacıdan şüphelendiğini duymuş. Melis de bir tamirciden _____.
   Answer 1: Duymuş Answer 2: Şüphelendiğini

7. Suat bir işçiyi üzmüş ve bir asistanı kızdırmış. Aylin de bir komşuyu _____.
   Answer 1: Üzmüş Answer 2: Kızdırmış

8. Ercan bir davetliyi kıskanmış ve bir konuşmacıyı susturmuş. Miray da bir genci _____.
   Answer 1: Susturmuş Answer 2: Kıskanmış

9. İlhan bir polise yaklaşmış ve bir memura karışmış. Deniz de bir arkadaşına _____.
   Answer 1: Yaklaşmış Answer 2: Karışmış

10. Koray bir şoföre kanmış ve bir taksiciye bağırmış. Şule de bir yolcuya _____.
    Answer 1: Bağırmış Answer 2: Kanmış

11. Murat bir görevliden bıkmış ve bir nöbetçiden kaçınmış. Simge de bir temizlikçiden _____.
    Answer 1: Bıkmış Answer 2: Kaçınmış

12. Ceyda bir avukattan sıkılmış ve bir savcıdan saklanmış. Öncel de bir hizmetliden _____.
    Answer 1: Saklanmış Answer 2: Sıkılmış

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