Processing Garden-Path Sentences in Sight Translation: An Experimental Study

Yazılı Metinden Sözlü Çeviride "Garden-Path" Tümcelerin İşlemlenmesi: Deneysel bir Çalışma

Araştırma/Research

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ABSTRACT

This study aims to investigate whether sight translators who are trained on this type of translation perform better in overcoming garden-path effect when compared to other translators who are not trained in sight translation. During the translation of such sentences, the sight translator is expected to parse the syntactic order of the source text correctly to grasp the meaning, and reformulate the message in the target language applying the necessary transpositions in the word order. An experiment was designed to test the performance differences in sight translation of garden-path sentences. Experimental and control groups were given five garden-path sentences within various contexts and were asked to record their voices. The results showed that trained sight translators tend to perceive garden-path sentences as a whole and concentrate on the message of the sentence, making use of certain skills and techniques in reading. In this sense, trained sight translators are more successful in parsing complex sentences with garden-path effect when compared to translators who are untrained in sight translation.

Key words: garden-path sentence, sight translation, parsing, working memory, sentence processing

ÖZET

Bu çalışma, yazılı metinden sözlü çeviri eğitimi almış çevirmenlerin, "garden-path" etkisini, bu konuda eğitim almamış çevirmenlere göre, daha kolay çözümleyip çözümleyemediklerini ortaya koymayı amaçlamaktadır. Yazılı metinden sözlü çeviri sırasında çevirmenin bu tümcelerin içerdiği anlamı kavrayabilmesi için sözdizimsel öğeleri doğru bir şekilde ayrıştırması ve tümcenin anlamını erek dilin sözdizimine uygun olarak yeniden düzenlemesi gerekmektedir. Çevirmenlerin yazılı metinden sözlü çeviride "garden-path" tümcelerini çözümlemedeki performansını test etmek üzere bir deney tasarlanmıştır. Deney ve kontrol gruplarındaki katılımcılara yazılı metinden sözlü

çeviri yapmak üzere farklı bağlamlarda beş "garden-path" tümcesi verilmiş ve kendilerinden çeviri sırasında seslerini kaydetmeleri istenmiştir. Çalışmanın sonuçları yazılı metinden sözlü çeviri alanında eğitim almış çevirmenlerin tümceleri daha çok bir bütün olarak ele aldığını ve ilgili çeviri türüne özgü beceri ve tekniklerden faydalanarak tümcelerin içerdiği mesaja odaklandıklarını göstermiştir. Bu bağlamda, belli becerileri edinmiş çevirmenler, "garden-path" etkisi içeren karmaşık tümcelerin sözdizimlerini ayrıştırmada yazılı metinden sözlü çeviri eğitimi almamış çevirmenlerden daha başarılıdır.

Anahtar Sözcükler: "garden-path" tümcesi, yazılı metinden sözlü çeviri, ayrıştırma, çalışma belleği, tümce işlemleme

1. Sight Translation as a Cognitive Process

Though usually regarded as supplementary to simultaneous and consecutive interpreting, sight translation entails a complicated mental processing and thus requires certain skills to deal with its inherent complexities. First of all, in consecutive and simultaneous interpreting the code to be translated is oral, while in sight translation it is written. As opposed to simultaneous interpreting, in sight translation, the translator produces target-text simultaneously with visual reception of the written source text, not with the delivery of the source text (Pöchhacker, 2004, p. 19). In other words, during sight translation, the translator is involved in a mental process in which comprehension of visual input and production of spoken output are at work simultaneously (Shreve et al., 2010, p. 63). For Mikkelson (1995), the continued interference of the visual input as well as sight translator's tendency to attach his/her focus to the *words* rather than the message within utterances —as in the case of simultaneous interpreting— complicate the sight translation process (para. 2). Therefore, the cognitive difficulty for sight translators is that they need to cope both with aloud real-time production, concurrently reading the text, and the density of information embedded in the linguistic units at all levels (Shreve et al., 2010, p. 64). Even though the mental processes in simultaneous interpreting and sight translation are similar in nature, that is to say exposure to the oral/written source text is continuous as the utterance of the target text continues, the latter requires distinctive skills and strategies (Ersözlü, 2005, para. 5).

As Pratt (1991) summarizes, through exercises, sight translators can develop certain mental skills such as "comprehension speed, memory, ability to perceive the whole text, not its separate parts, ability to visualize key words, synthesizing skills, ability to avoid using false cognates, mental processing and speech rate, concentration level" (as cited in Krapivkina, 2018, p. 696). Trained sight translators are expected to succeed in mental tasks such as speed-reading, skimming and scanning, fluent production, paraphrasing, parsing complex sentences, chunking, etc. Sight translators usually do not have time to rehearse the text, they are supposed to translate at sight; they can only skim the text to gather information about the subject matter, context, and style.

Sight translation, as with all other types of interpreting, is message-oriented. However, due to linguistic distinctions between the source and target language, the

sight translator can opt to paraphrase the source text units so as to restate them more easily in the target language. Sight translators also tend to split linguistic units into syntactic phrases or sets of information so as to assemble them as larger meaning units through parsing and chunking procedures. This mental process helps sight translators to determine the order of translation units; thereby they are able to decide on which bit of information in a sentence should be stated first in the translation process (Ersözlü, 2005, para. 17). Therefore, sight translators are automatically guided by the syntactic order of target language; that is they read the source text according to the syntactic order of target language. For instance, a sight translator translating from English into Turkish will, as a first step, look for the main verb of the sentence as the syntactic order of two languages differ (i.e. in English, Subject + Verb + Object, and in Turkish, Subject + Object + Verb.) Thus, sight translators are expected to process sentences more analytically and efficiently deal with the complexities stemming from varied syntactic structures. However, as Agrofolio (2004) puts it, this process is not always smooth since readers or sight translators, unlike listeners who focus on the gist of meaning, tend to concentrate on the actual words of a text (p. 48). This may cause repetitions and pauses in speech, or even restatement of the output due to translation errors.

Studies on sight translation generally focus on the distinctions between simultaneous interpreting and sight translation. Viezzi (1990) compared information retention after two forms of interpreting in the simultaneous mode (i.e. sight translation and simultaneous interpreting). As a result of an experiment conducted with student interpreters working from English or French into Italian, he found that recall scores were lower after sight translation than after SI only for the morphosyntactically dissimilar English–Italian language pair (p. 60). Lambert (2004), tried to compare the types of processing in sight translation and simultaneous interpreting in terms of the effect of visual presentation of the written material to be interpreted, and to investigate whether it enhances or hinders performance in both types. In her conclusion, Lambert stated that visual presentation of written material does not necessarily interfere with sight translators' capacity to listen and speak simultaneously (p. 304). In another study, Agrifoglio (2004) described sight translation by comparing it to simultaneous and consecutive interpreting. She concluded that interpreters face different difficulties and use different efforts in each mode and that cognitive demands on the interpreter for sight translation are by no means less than those of simultaneous and consecutive (p. 43). Eye-tracking methods reveal many aspects of sight translation process. Shreve, Lacruz and Angelone (2010), tried to unearth the nature of disruptions in sight translation by comparing it to the written translation process. They found that sight translation is more sensitive to disruption and visual interference (p. 80). The processing of ambiguous meaning and syntactic structure in sight translation has not drawn much attention from scholars. In her dissertation, Neveu (2018) investigated the time course of language activation in sight translation. To this end, participants were asked to translate sentences with ambiguous words and sentences with non-ambiguous words from Spanish into English. The study showed that ambiguous sentences did not have an effect on the first fixation duration of sight translators.

These studies, and many others, show that scholarly interest focuses on the cognitive process of sight translators, mostly in comparison to simultaneous interpreting. In the present study, however, I set out, with a problem-oriented approach, to investigate the performance of students, who received sight translation training, in overcoming garden-path sentences in comparison to those who are not trained in this mode of translation. With such an objective, this study is expected to reveal the disruptive effect of garden-path sentences during sight translation and to show that sight translation training could be effective in coping with this linguistic-based translation problem.

2. Working Memory and Sentence Comprehension

Since this study focuses on mental processing during a specific linguistic task, it is important to recall the components of human memory. It is generally accepted that human memory is divided into two components: working memory (short-term memory) and permanent memory (long-term memory). The latter is also divided into two as semantic memory and episodic memory; the former of which deals with the knowledge of general facts; while episodic memory is concerned with personally experienced facts (Carroll, 2008, p. 50-51). Working memory, on the other hand, can be defined as "the temporary storage of information that is being processed in any range of cognitive tasks" (Baddeley, 1986, p. 34). It plays an important role in psycholinguistic studies since such studies provide insight on how language is processed in comprehension and production. One of the most revered models of working memory was proposed by Baddeley and Hitch in 1974. After two revisions, the model has three components: central executive, phonological loop, and visuospatial sketchpad (Carroll, 2008, p. 48). The functions of the phonological loop are holding phonological representations for a short period of time and enabling to covertly or overtly rehearse exposed materials. Visuospatial sketchpad temporarily maintains and manipulates visuospatial information and central executive determines what activities the former two components should be doing at any given time (p. 48). In short, with such a complex set of functions, working memory has a crucial importance in language processing, particularly in language comprehension and production.

The main focus of this study is on language processing in the working memory with a particular interest in syntactic parsing and comprehension. The fundamental purpose in comprehension at sentential level is to assign thematic roles to words in the sentence being processed. These roles provide the reader or hearer with the information of thematic relations in a sentence (i.e. who is doing what to whom) (Harley, 2005, p. 262). Verb's argument structure in a sentence gives the core clue for the description of thematic roles. For instance, the verb "give" has the structure AGENT gives THEME to RECIPIENT. Thus, in a sentence such as *John gave the ring to Jane*, 'John' stands for the AGENT, 'the ring' for the THEME and 'Jane' for the RECIPIENT. One of the functions of working memory pertaining to sentence comprehension is syntactic parsing. Parsing refers to mental computation of syntactic structure of the sentence (p. 262). Hence argument structure of verbs and thematic roles play a central role in

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parsing. Parsing requires certain linguistic information to be already known (e.g. syntactic category). During the parsing process, working memory automatically retrieves information from semantic memory about which word belongs to which category (e.g. noun, verb, adjective, adverb, etc.). After this step, these categories are combined to form phrases (p. 262) by means of which we start to construct the meaning of the sentence we are hearing or reading. Nevertheless, this task may sometimes be spoiled in case of some ambiguous sentence structures. A typical case of sentence comprehension fallacies can be observed in garden-path sentences.

2.1. Garden-Part Sentences

Garden-path refers to a type of temporary syntactic ambiguity in which the phrase structure rules allow two possible attachments of a constituent (Fromkin, Rodman & Hymas, 2011, p. 385). A typical example of this situation is as follows: *The horse raced past the barn fell* (p. 385). When we hear or read this sentence we may interpret the *raced* as the main verb of the sentence, VP syntactic structure of which is represented as [V PP NP]$_{VP}$. However, when we realise that in fact the first clause contains a reduced relative clause and the main verb is *fell*, the syntactic order turns to [V [NP PP]$_{NP}$]$_{VP}$, and we understand that the first clause does not involve a flat tree structure rather involves an embedded complex noun phrase (Pickering & van Gompel, 2006, p. 457). It is of great importance to indicate that sentential stress plays a decisive role in understanding whether the phrase is a VP of the main clause or an NP of an embedded clause. However, when reading, one can only comprehend the syntactic structuring of the sentence when eye movement is fixed on the verb *fell* at the end of the sentence.

The problematic situation with garden-path sentences derives from the multiple possible deep structures intertwined in the pseudo-identical surface structure. In the course of parallel processing of phonological, morphological and syntactic structures of the sentence, this pseudo-identicalness leads one to misinterpret the desired semantic content. Therefore, during the reading process, the reader is forced to backtrack and reinterpret the sentence (Carroll, 2008, p. 5). This situation is true of the normal reading process in which the saccades, or the movements of eyes during reading, are taking place without interruption. If the reader misunderstands the sentence or a portion of text, then eyes moves backwards (regression) and reconsider the syntactic structure. It is plausible to think that different reading techniques and the intention of reading activity may have an impact over the disambiguation of garden-path sentences. One of the different ways of reading can be observed in sight translation. Since sight translation products are rendered while reading, audio recording during the processing of garden-path experimental sentences may reveal some information about sight translators' cognitive processes the disruptive effect of garden-path ambiguity can impact.

3. Method

Five pieces of texts including garden-path sentences were prepared to be translated by the students from Hacettepe University, Department of Translation and Interpreting. An experimental (hereafter EG) and a control group (hereafter CG) were determined for the translation task. The EG was composed of 10 fourth-grade students who were all in the interpreting section of the undergraduate programme. All students in the EG had already completed the sight translation course in which they were trained in techniques, among others, such as parsing, chunking, paraphrasing and speed-reading. 10 participants in the CG, on the other hand, were randomly selected from second-grade students of the same department. These students had not taken any course on sight translation.

First, both groups were given the instructions about the sight translation task, without mentioning any sight translation techniques. Each group was informed about unknown words and terminology, which might operate as an additional distracting factor in sight translators' cognitive processing. All participants were tested individually, each one of them was assigned a simultaneous interpreting cabin. The students were instructed to translate the five textual excerpts at sight, without any previewing. Thus, they did not have information about the syntactic structures of the sentences within the texts. Such a precaution needed to be taken so as to clearly observe reading habits of sight translators and to have the opportunity to compare the performance of two groups in overcoming the garden-path ambiguity.

Four out of five garden-path sentences the participants of each group sight translated were given in contexts. The experimental texts used in sight translation had a mean length of 46 words, ranging from 11 to 83 words. Only one sentence was given in isolation without any context so as to determine if contextual information has an effect on comprehensibility of garden-path sentences. Both groups were asked to record their voices during sight translation, and it was ensured that each student attempted to translate the texts only once. Audio recordings have been evaluated in terms of correct word-class assignment, duration of the sight translation, pauses and repetition of linguistic units. These recordings have been statistically and linguistically analysed only for the garden-path sentence segments of each experimental text.

4. Analysis and Results

The findings of the present study have two folds. The success of participants in parsing garden-path sentences has been evaluated based on the audio recordings; and mean of the measurements (i.e. duration of sight translation, number of pauses, duration of pauses and number of repetitions) has been computed for each group. The statistical results of the latter are given in Table 1.

Table 1

Mean values of the experimental and control groups

Texts	Group	Total duration of ST (ms)	Nb. of pauses	Total duration of pauses (ms)	Nb. of repetitions
Text 1	Exp.	9383,33	2,66	1024,66	0,66
	Cont.	10043,6	4	4086,6	0,8
Text 2	Exp.	9554,66	2,33	4643,66	1
	Cont.	7067,2	3,6	4295,4	1,6
Text 3	Exp.	10169,66	2	4073,66	0,66
	Cont.	11102,4	3,4	5219,8	1
Text 4	Exp.	15366,33	2,33	12399,33	0,66
	Cont.	24855	3,66	15154	1,33
Text 5	Exp.	19972,66	1,66	15885	0
	Cont.	18050,6	3,6	12726,2	1

The first experimental text (Text 1) is as follows:

(1) The budget talks held in the Turkish Grand National Assembly last week began with the discussions concerning oil prices. *The government plans to raise oil prices at the end of 2013 were suspended.* The group spokesman of the main opposing party stressed that it was irrelevant to discuss the oil prices in the session of budget talks.

The garden-path effect in the first piece of text falls into the second sentence (i.e. *the government plans to raise oil prices at the end of 2013 were suspended*). The garden-path effect in the sentence derives from the word class category of the word *plans.* The reader may interpret the word as the main verb of the sentence until he/she recognizes that the main verb is a passive structure at end of the sentence and thus *plans* is the noun head of the NP *government plans.*

 Text 1.

 (a) Experimental group performance samples:

 EX1-f: *e:r iki bin on üç yılının son zamanında e:r hükümet benzin fiyatlarını arttırmayı <u>planlamaktaydı</u> ancak <u>bu</u> (.) bir süre sonra e:r askıya alındı*

 EX2-f: *(1) hükümet (.) benzin fiyatlarının iki bin on üç yılının sonunda (.) artmasını (.) e:r <u>planlıyorken</u> (.) <u>bu (.) planlar</u> askıya alınmıştır*

 (b) Control group performance samples:

 CT1-m: *(4) devletin e:rm benzin fiyatlarını iki bin on üçün sonunda (.) yükseltme <u>planları</u> askıya alındı*
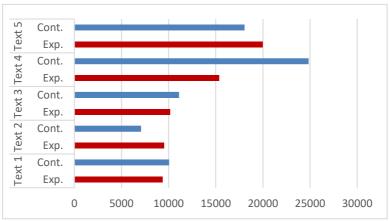
 CT2-f: *(3) iki bin on üçte (1) benzin fiyatlarını (.) yükseltme <u>düşüncesi</u> askıya aldı*

8 out of 10 subjects in the EG succeeded in interpreting the phrase *government plans* either as an NP or VP. Those who designated the phrase as the VP of the sentence

divided the sentence into two and began uttering the second sentence with the word *plan* as the subject of the sentence. The process of this spontaneous decision is exemplified in the transcribed sight translation of the participants EX1-f and EX2-f; they made use of both forms of parsing —through lexical repetition or deictic word. Therefore, using the paraphrasing technique, they solved the garden-path, conveying the message without any loss in meaning. In the CG, 3 out of 10 students interpreted the phrase *government plans* as an NP, *hükümetin planları* [government plans], as exemplified in the transcriptions of CT1-f and CT2-m. Some participants who did not interpret the word *plans* as a noun regarded it as the main verb of the sentence and omitted the verb *were suspended* from the target output. Others retranslated the sentence in order to assign the correct word class category.

The mean total duration of EG's sight translation was 9383,33 ms., while CG's was 10043,6 ms. for the garden-path sentence within Text 1. Despite the numerical distinction between the groups in terms of their success in parsing, a t-test showed that the difference in the mean duration of the task was not statistically significant, $p > .05$ — duration differences can also be seen in Figure 1 and Figure 2. The mean number of pauses for the EG and CG were respectively 2,66 and 4, while the mean number of repetitions were respectively 0,66 and 0,8. The difference between the scores of two group in these parameters were not statistically significant either, $p > .05$. The two groups differed from each other significantly ($p = 0,012$) for the mean duration of pauses, $p > .05$. The participants in the EG tend to paraphrase the source sentence with an effort to convey the message in the output, while the participants in the CG who did parsing correctly in consideration of their output seemed to have concentrated heavily on the syntactic order of the source text. The mean of the increased duration, particularly the utterance-initial pauses, may be due to this.
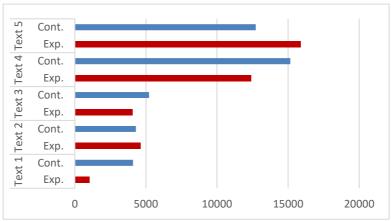
Figure 1

Mean durations of sight translation compared for each experimental text

Note. Mean values are shown in milliseconds.

Figure 2

Comparison of mean duration of pauses in sight translation for each experimental text

Note. Mean values are shown in milliseconds.

The second experimental text (Text 2) is as follows:

(2) Last week we went to the countryside where my and Mike's grandpa had a farm house. He welcomed us with the warmth of countrymen as he does all the time. We stood up for a while near the stables where he looked after his horses. All of a sudden, a huge noise broke out near the stables. Two horses threw themselves out of the stable gate. One of them ran into the forest. *The other horse raced past the stable fell.*

This piece of text exemplifies a typical kind of garden-path effect with the sentence, *the other horse raced past the stable fell.* The garden-path effect in this sentence derives from the reduced relative clause, i.e. *the other horse* [that] *raced past the stable.* The reader, again, may suppose that the head verb is *race* until he/she realizes the final word, *fell*, is the head verb of the main clause.

Text 2.

(c) Experimental group performance samples:

EX3-m: *(1) diğeri de (2) ahırın (.) oradaki çitlerden (.) a- ahırın oradan e:r geçerek koş- e:r koşmaya devam etti*

EX4-f: *(3) diğeri de ah- e:r ahır çitlerinin üzerinden geçerek koşmaya devam etti*

(d) Control group performance samples:

CT3-m: *(.) diğeriyse (2) e:rm ahırdan çıktığı anda düştü*

CT4-f: *(2) e:r diğeri de ahırı (.) e:r geçerek (1) e:r ahırı geçerek düştü*

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Interpretation of this text by two groups showed identical scores: 4 out of 10 participants in both the EG and CG conveyed the correct meaning in the target language. 2 of the 4 participants in the EG referred to above interpreted the phrase *the other horse raced past the stable* as a relative clause embedded in the NP, while all of the participants who conveyed meaning in the target output in the CG either divided the sentence into two or interpreted the relative clause as an adverbial clause of the VP *fell*, i.e. *diğer at ahırın yanından koştu ve düştü* [the other horse raced by the stable and fell]/*diğer at ahırın yanından koşarak düştü* [the other horse fell racing by the stable]. Some of the subjects in the EG who could not parse the sentence, as exemplified by EX3-m and EX4-f, did not recognize that the word *fell* functioned as a verb, simply omitting it in their translations. The participants who succeeded in parsing in the CG (e.g. CT3-m and CT3-f) identified the main verb and conveyed the meaning into the TL with what could be referred to as minor losses.

The statistical assessment of their performances revealed that the EG scored a mean duration of 9554,66 ms. as compared to the CG whose mean value was 7067,2 ms. Although the participants in the EG spent more time on translation, the difference in the mean values was statistically insignificant, $p > .05$. The mean number of pauses identified in the performance of the EG and CG were respectively 2,33 and 3,6. These figures did not reveal a significant difference either. The difference between the mean duration of pauses, 4643,66 ms. and 4295,4 ms. respectively, as well as the mean number of repetitions, 1 and 1,6 respectively, were not statistically significant. The insignificant difference between two groups and, further, EG's higher duration of translation, may be explained with the semantic complexity of the phrase *raced past the stables.* Although the context provides adequate information about which sense of the verb *race* may be used to translate, the participants may not have been able to pinpoint this and may have been distracted and unable to focus on the parsing of the syntactic structure.

The third experimental text of the study is as follows:

(3) Two days ago, I stopped reading a new so-called best-seller. *The author wrote the novel was likely to be a best-seller.* His style was discouragingly plain and his plot organization was so complicated that I could not even relate one chapter to another.

The third garden-path sentence, *the author wrote the novel was likely to be a best-seller*, also includes a reduced that-clause, i.e. *the author wrote [that] the novel was likely to be a best-seller.* 6 out of 10 subjects in the EG successfully assigned the main verb of the sentence (i.e. *was (to be)*). Most of the subjects in the EG sight-translated the reduced that-clause, which functions as a noun clause in the object position, with compensating clauses. EX5-f, for instance opted for using a verbal clause functioning as an adverbial: *kitabın […] çok satan bir kitap olmasını bekleyerek* [expecting it to be a best-seller]; EX6-m, in a similar vein, rendered the nominal that-clause as another adverbial: *kitabı çok satsın diye* [for the book to sell much]. Although these examples show that the participants retained the verb *to write* as the main verb of the sentence though that was not the case, they tried to compensate for the gap in meaning through

change of nominals into adverbials. In the control group, on the other hand, 3 out of 10 participants assigned the correct verb as the main verb of the sentence. CT6-f, for instance, used the verb *söylemek* [to tell] as the main verb of the sentence: *best-seller gibi olduğunu, yazıldığını söyledi* [said that it was like, written as a best-seller]. 7 students constructed the VP of the sentence with the verb in the embedded clause. As CT5-f exemplifies, most of the participants in the CG identified the verbal clause modifying NP, (i.e. *the book)*, within that-clause, whereas it was in fact modifying the NP of the main clause: *kitabı yazan yazar çok büyük bir yazar olmaya adaydı* [the author who wrote the book was to be a great author]*.* Also, longer pauses were observed in the performances of the same 3 subjects who assigned the correct verb, which shows that they had regressions in reading the sentence to identify the main verb.

> **Text 3.**
>
> (e) Experimental group performance samples:
>
> **EX5-f:** *(7) e::r bu yazar e:r kitabın yazarı (.) bu kitabın sanırım e::r (.) çok satan bir kitap olmasını bekleyerek yazdı*
>
> **EX6-m:** *(1) yazar kitabı (1) çok satsın diye (.) yazmış sanki*
>
> (f) Control group performance samples:
>
> **CT5-m:** *(3) yaz- (.) kitabı yazan (.) yazar (.) çok büyük bir yazar olmaya adaydı*
>
> **CT6-f:** *e:rm (2) yazar:: (1) e::rm bestselır gibi olduğunu e:rm yazıldığını söyledi*

The EG's mean total duration of sight translation was 10169,66 ms. and the CG had a total mean score of 11102,4 ms.; the difference did not reveal a statistical significance in the t-test. The difference between two groups' mean number of pauses for this text was statistically significant (p=.039), p > .05. This result, along with the percentage of the successful participants in the CG, shows that those who had not have any experience in sight translation tended to be interrupted in the process of parsing the garden-path sentence. The mean duration of pauses for the EG and the CG were respectively 4073,66 ms. and 5219,8 ms., while the mean number of repetitions were respectively 0,66 and 1. The difference between the scores of two group in these parameters were not statistically significant.

Text 4 of the experiment is as follows:

> (4) Jack thought to himself that he was so rude to Jane last day. So, he has been changing his way whenever he comes across with her. After all, they say, *"the man who hunts ducks out on weekends"*.

The garden-path effect in the fourth text stems from the multiple syntactic category of the word *duck.* At first glance, it is likely to interpret it in two ways: first, as a head noun, as in the phrase *to hunt duck*; second, as the main verb, in the form of phrasal verb, *to duck out.* If the reader chooses the former, then he/she has to find another verb in the sentence in order to parse the VP. The sight translation of the sentence with the garden-path is further complicated by the metaphoric meaning it includes. Under the stress of temporal restrictions, such accompanying translation

problems may disrupt the sight translator's concentration on the message of the written material, and make the cognitive processing more effortful.

Text 4.

(g) Experimental group performance samples:

EX7-f: *(5) sonuçta ne derler bilirsiniz (8) öfkeyle kalkan zararla oturur*

EX8-f: *(8) ne de olsa (.) söylendiği gibi (.) insan her zaman aynı şekilde davranmaz*

(h) Control group performance samples:

CT7-f: *sonuçta (8) e:r sonuçta hani e::r <@> bir saniye </@> (3) yani (9) e:r sonuçta hani derler ya (.) <sighing> of: ah: </sighing> allah alla:h (8) <fast> ya burada çapkınlıktan bahsediyor sanırım ama </fast> (12) tabii bir yere kadar saklanabilir herhalde (2) sonuçta bir yere kadar saklanabilir*

CT8-f: *neyse ki e:r şöyle derler e::r hafta sonları (.) her zaman (.) ilaç gibi gelir*

The analysis of audio recordings showed that the participants' challenge with the metaphoric meaning of the sentence hampered their success in parsing the garden-path structure. Leaving the issue and analysis of parsing aside, 2 out of 10 participants from the EG approximated the original meaning in the TL, while none of the subjects in the CG conveyed the source meaning into the TL. Despite their long utterance-initial pauses, EX7-f and EX8-f, who succeeded to produce a near approximate meaning, made use of the contextual information to convey, somehow, the metaphorical meaning into the TL, without fidelity to the meanings of the word in isolation and the syntactic order. Several participants in the CG, on the other hand, were not able to use the contextual information to reproduce an adequately close translation in the TL. As the number and duration of pauses in the transcription of CT7-f's utterances attests, some participants even detached themselves from the whole process of sight translation which requires concentration and continuity. Other subjects in the CG who tended to be more concise, with low duration of pauses, were also not able to reproduce the original meaning.

The EG's mean duration of sight translation was 15366,33 ms., while the control group's was 24855 ms. Although the participants in the CG spent considerably longer time in translating the garden-path sentence at sight, the difference was not statistically significant. The difference between the groups in terms of the number of pauses, and repeated linguistic units did not reveal a statistical difference. There was a remarkable increase in the mean duration of pauses in comparison with the earlier performances of both groups. The EG's mean duration of pauses was 12399,33 ms., while the CG had a mean score of 15154 ms. Although there was no statistical significance in the difference of mean scores, comparing these figures with the mean durations of sight translation, it may be deduced that the outputs of participants in the CG were more wordy and their cognitive processing was regressive, while the subjects in the EG were more non-regressive and message-oriented in spite of lengthy pauses during utterances.

The fifth experimental text is as follows:

(5) The florist sent the flowers to little lady was pleased.

The last sentence was presented to both groups in isolation without any contextual information. In this case, the interpretations need to be evaluated more analytically since the order of syntactic units in the target text as well as pauses and repetitions of readers might give clear clues on the attitudes of the two groups. The sentence exemplifies a garden-path effect resulting from a reduced relative clause post-modifying an NP: *the florist* [who] *sent the flowers to little lady was pleased.*

Text 5.

(i) Experimental group performance samples:

EX9-f: *(12) çiçekçi küçük hanıma çiçek gönderdi (3) ve mutluydu*

EX10-f: *(10) küçük hanıma çiçekler gönderen çiçekçi mutluydu*

(h) Control group performance samples:

CT9-f: *e::r (3) e:r <whispering> florist </whispering> (2) e::r (7) e::r (3) küçük e:r çiçekçi küçük hanıma (.) memnun olması için çiçekler gönderdi*

CT10-m: *(17) çiçekleri (.) küçük (.) hanıma yollayan çiçekçi memnun kalmıştı*

8 out of 10 participants in the EG were considerably successful in parsing the sentence; while 5 out of 10 subjects in the CG parsed the sentence successfully. One possible explanation for relatively higher number of successful participants in both groups in the sight translation of this text may be that the sentence was not inserted into a piece of text. Rather, the sentence was in isolation and there was no additional translation problems such as idiomatic or connotative use of language. Also, the participants were not involved in a cognitive process in which they had to grasp the gist of meaning through contextual details. However, in this instance, in the case of both groups, a considerable increase in the utterance-initial pauses were observed. As can be seen from the transcriptions of EX9-f and EX10-f, the participants paused for 5 to 17 seconds before they uttered their translation. Therefore, without contextual information, the subjects tended to spend more time on deciphering the ambiguity. As the difference between the numbers of successful participants in both groups reveals, students who were trained to translate at sight performed better than those who did not receive sight translation training. Some of the subjects in the EG (e.g. EX9-f) could identify the garden-path effect dividing the sentence into two and post-modified the NP, *the florist*, with two different VPs in a paratactic relationship: *çiçekçi küçük hanıma çiçek gönderdi ve mutluydu* [the florist sent flowers the little lady, and he/she was happy]. Other successful participants in the same group (e.g. EX10-f) were able to parse and reconstructed their output as a single sentence, embedding the garden-path form as a pre-modifier verbal (i.e. *çiçek hanıma çiçekler gönderen* [who sent flowers to the little lady])*. This reveals that trained sight translators do not handle garden-path sentences in a linear fashion; rather they focus on the significant part of the sentence in accordance with the syntactic order of target language.

For text 5, the EG's and CG's mean durations of sight translation were respectively 19972,66 ms. and 18050,6 ms., and their mean duration of pauses were 15885 ms. and 12726,2 ms. respectively. The difference between these mean values

revealed no statistical significance. The total mean number of pauses in the EG was 1,66, while it was 3,6 in the CG. Thus, the subjects in the latter produced more number of pauses, as exemplified by CT9-f, and the difference between the groups approached statistical significance, p=.085. In a similar vein, the participants in the CG repeated more number of linguistic units during sight translation task, and the difference in the mean numbers of repetition approached statistically significance too, p=.055. These quasi-significant values can be seen as an evidence to the fact that the subjects who practiced sight translation for the first time without any training go through a more disruptive cognitive process in case of garden-path effect.

There is a significant difference in the overall percentages of two groups in all sight translation texts in terms of successful parsing: the EG achieved parsing with an overall percentage of 52%. The CG, on the other hand, could overcome the garden-path effect during sight translation with a percentage of 26%.

5. Discussion and Implications

This study provides insight on whether sight translators are more competent in parsing ambiguous syntactic structures when compared to ordinary readers or translators who are untrained in sight translation. It is undeniable that people with stronger working memory do better in language comprehension and production. Nevertheless, there are some instances, in the language comprehension process in which different skills and techniques come into play. Sight translation provides examples of such cognitive processing. The results of the present study have revealed the distinctive nature of syntactic parsing in sight translation through interference of garden-path effect in the process. In this peculiar way of processing, sight translators make use of a different way of reading, and they tend to comprehend sentences holistically with a goal to grasp the gist of meaning. As the results show, it may be posited that without any training on the techniques and practice, those who translate at sight tend to be more distracted by ambiguous syntactic structures; this distraction manifests itself particularly with longer duration of pauses and frequent interruptions.

Garden-path sentences provide interesting insight on how working memory functions in language comprehension, particularly in reading. While reading a garden-path sentence, we realize that saccades are interrupted and our eyes move regressively in order to disambiguate the sentence structure formed in the mind. However, in sight translation, the order of syntactic components is determined by the syntactic order of the target language, which forces the interpreter to read the text in a different fashion. Also, sight translators apply certain skills such as using contextual clues, chunking, paraphrasing etc., and thus they may interpret the meaning of a garden-path sentence with less effort. In the instances when sight translators have difficulty in assigning the right word class category in the target text, they apply compensatory methods such as dividing sentences and paraphrasing. As Agrofolio (2004) argues, due to visual presence of the text, sight translators are hindered in grasping the gist of meaning. However, the

findings of this study may underline the importance of additional skills sight translators are expected to have when compared to normal readers.

As the results revealed, other complications that impede cognitive processing, such as complex contextual information and metaphorical language, can 'camouflage' sight translators' skills in coping with garden-path effect. It was observed that syntactic parsing difficulties increased due to contextual information and the length of the text. The more complex the context, the more syntactic and semantic units to parse. Similarly, metaphorical language may divert sight translator's attention from the garden-path structure, leaving the researcher with irrelevant results. Further analyses may be conducted to reveal the effect of context and other complicating factors on sight translators' effort in coping with garden-path sentences. This study is based on the data acquired from the audio-recordings of the subjects. Further research designs based on eye-tracking methods, however, can give more insight on sight translators' cognitive processes during parsing garden-path sentences.

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Appendix. Transcription conventions

EX1-f	speaker ID: female participant from the experimental group #1
EX1-m	speaker ID: male participant from the experimental group #1
CT1-f	speaker ID: female participant from the control group #1
CT1-m	speaker ID: male participant from the control group #1
(.)	pause less than a second
(1), (2), etc.	longer pauses in second(s)
e:r / er:m	long utterances
e::r / er::m	longer utterances
a- , ah- , etc.	word fragments
<@> </@>	utterance spoken laughingly
<fast> </fast>	fast speaking mode
<whispering> </whispering>	whispering speaking mode
<sighing> </sighing>	sighing speaking mode