Federal University of Uberlandia

Institute of Language and Linguistics

Undergraduate Program in Translation

TAPPING INTO THE PROCESS OF LITERARY TEXT TRANSLATION: AN EXPLORATORY STUDY

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Translation is a skill and an art as well as a science.

Newmark

Abstract

This senior thesis taps into the translation process of a literary text and analyses some features of the final products as provided by two different groups of participants under experimental conditions, namely: three undergraduate Translation students from Federal University of Uberlandia, and three English Instructors that allegedly know and appreciate J. R. R. Tolkien's work. The objectives were to analyse the difference in the cognitive process between the two types of participants, by means of task duration, orientation, drafting, revision, segmentation, pause, micro translation unit, recursiveness, and meta-reflection, and to assess the solutions the participants provided to some linguistic features in the source text. Key logging and eye tracking were used as methods to collect and analyse data. The results point out that the English instructors had a more expert-like behaviour, and it took them less cognitive effort to perform the translation task, while the Translation students used linguistic features that were more representative of the source text and similar to a previous published translation into Brazilian Portuguese by R. E. Kyrmse. This research contributes to enlarging the still incipient body of knowledge of the cognitive processes of literary translation, and suggests a need for enhancing practice on the translation of literary texts in an undergraduate program in translation.

Keywords: Translation Process Research. Literary text translation. J. R. R. Tolkien. Key logging. Eye tracking.

Resumo

Esta monografia investiga, sob condições empírico-experimentais, o processo cognitivo envolvido na tradução de um texto literário e analisa algumas características dos produtos finais com base nos dados obtidos de dois grupos distintos: três alunos do curso de graduação em Tradução da Universidade Federal de Uberlândia e três professores de inglês que dizem conhecer e apreciar o trabalho de J. R. R. Tolkien. Um dos objetivos foi analisar as diferenças nos processos cognitivos entre os dois tipos de participantes observando duração da tarefa, orientação, tradução, revisão, segmentação, pausa, microunidade de tradução, recursividade e metarreflexão. Outro objetivo foi analisar as soluções dadas pelos participantes a alguns aspectos linguísticos presentes no texto-fonte. Utilizaram-se como métodos de coleta e análise de dados: registro de acionamentos de *mouse* e teclado (*key logging*) e rastreamento ocular (*eye tracking*). Os resultados revelaram que os professores de inglês tiveram um comportamento mais experto e demandaram menos esforço cognitivo para realizar a tarefa de tradução, enquanto os estudantes de Tradução empregaram traços linguísticos mais representativos do texto-fonte e similares à tradução de R. E. Kyrmse já publicada em português do Brasil. Esta monografia contribui para ampliar os ainda incipientes conhecimentos sobre os processos cognitivos envolvidos na tradução de textos literários e sugere a necessidade de se ampliar a prática de tradução de textos literários na formação de tradutores em nível de graduação.

Palavras-chave: Estudos Processuais da Tradução. Tradução de textos literários. J. R. R. Tolkien. Key logging. Eye tracking.

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List of Abbreviations

AOI	Area of interest
ST	Source text
TPR	Translation Process Research
TT	Target text
TU	Translation unit
Part	Participant
Fixations	Fixation number
Mean fix	Mean fixation duration
Sum fix	Sum of fixation durations
StDev	Standard deviation of fixation durations
AllRec	All Recordings
Mp	Mean pauses
Mpd	Mean pause duration
Tpd	Total pauses duration
Mi	Mean insertions
Ti	Total insertions
Md	Mean deletions

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1 INTRODUCTION

From a process-oriented perspective, translation is an ill-defined problem to be solved by a human being while dealing with two different linguistic systems (SHREVE, 2006). As an ill-defined problem, translation imposes a task that will lead to a continuum of potential—and admissible—solutions depending on a number of factors, including cultural conventions and typological and registerial constraints (STEINER, 2004).

Translation Process Research (TPR) has drawn on such a notion of translation to investigate how the human being copes with translation tasks in different contexts. Most studies have focused on the translation of technical or news texts, but few have addressed the translation of literary texts (i.e., MALTA, 2015; DOMINGOS, 2016). Reasons for that may be that the translation of literary texts is too time-consuming, for it requires creativity and significant knowledge both of the author and of his/her work in the source language and previous translations of it in the target culture (NIDA, 1994; LANDERS, 2001; VENUTI, 2008; TRIVEDI, 2016).

To fill this gap, this senior thesis taps into the translation process of a literary text and analyses some features of the final products as provided by two different groups of participants under experimental conditions, namely: three undergraduate Translation students from Federal University of Uberlandia (i.e., T1, T2, and T3), and three English Instructors (i.e., E1, E2, and E3) who allegedly know and appreciate J. R. R. Tolkien's work. His biography can be found on the British Society's website *The Tolkien Society*[1]. The summary presented on the website is as follows:

> John Ronald Reuel Tolkien (1892-1973) was a major scholar of the English language, specialising in Old and Middle English. Twice Professor of Anglo-Saxon (Old English) at the University of Oxford, he also wrote a number of stories, including most famously *The Hobbit* (1937) and *The Lord of the Rings* (1954-1955), which are set in a pre-historic era in an invented version of our world which he called by the Middle English name of Middle-earth. This was peopled by Men (and women), Elves, Dwarves, Trolls, Orcs (or Goblins) and of course Hobbits. He has regularly been condemned by the Eng. Lit. establishment, with honourable exceptions, but loved by literally millions of readers worldwide.
>
> In the 1960s he was taken up by many members of the nascent "counter-culture" largely because of his concern with environmental issues. In 1997 he came top of three British polls, organised respectively by Channel 4 / Waterstone's, the Folio Society, and SFX, the UK's leading science fiction media magazine, amongst discerning readers asked to vote for the greatest book of the 20th century.

[1] Available at: <https://www.tolkiensociety.org/author/biography/>. Access on: 20 July 2017.

By using a 134-word-long excerpt from Tolkien's *Unfinished Tales* as an input, the assumption is that the two groups behave differently and eventually come up with significantly different solutions to both solve problems posed by Tolkien's peculiar writing and make their translation truly representative of Tolkien's work as already established in Brazil with the translations by Lenita Maria Rimoli Esteves, Almiro Pisetta, and Ronald Eduard Kyrmse. Tolkien adopts a peculiar type of English in his works—using archaic variants such as "thy", "thyself", "thou", "shalt" and "hail"—which represents an additional challenge for translators. Drout (2004, p. 154-155) describes Tolkien's type of creation in these terms:

> Tolkien's deliberate stylistic construct is in fact remarkably rich and successful not only in his own terms but also in terms of the stylistic canons of Modernist Literature in which, supposedly, form follows function. The analysis also supports Ursula Le Guin's contention that the craftsmanship of The Lord of the Rings is consistent at all levels of construction, from the individual sentence to the macro structure of the journey, a repeated stress and release pattern […]. This tightly inter-connected series of aesthetic effects (one might even call the multi-level repetition a "fractal" structure) is one of the aspects of Tolkien's fiction that separates his from other fantasies, and other forms of literature, that are far less meticulously crafted.

Tolkien's work is published in Brazil by Martins Fontes publishing company. In a 2013 interview[2] given to Brazilian newspaper Estadão, brothers Alexandre and Evandro Martins Fontes, owners of Martins Fontes at the time, stated *The Lord of the Rings* was one of the most important and successful series they had ever published, selling over 1 million copies in Brazil. However, Evandro Fontes revealed it only became a success after the first movie premiere on January 1st, 2001. Their first publication of Tolkien was older than 20 years, time enough to establish a known nomenclature and to make it recognizable as official or canonical in Brazilian Portuguese (TRIVEDI, 2016). The fact that Tolkien is being published in Brazil for so long sets an extra challenge for any translator, who assumedly needs to seek for renditions that sound representative of Tolkien's universe (e.g., used characters' name, name of places, formal constructions). One such an example is that translators Lenita Rimoli and Almiro Pisetta sued Martins Fontes for breach of copyrights in the subtitles and dubbing of feature film *Lord of the Rings* (FERRARI; MACHADO, 2014), which contained precise copies of parts of their previous translations.

The specific objectives of this work are as follows:

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[2] ESTADÃO. *Um legado a duas vozes*, 1 fev. 2013. Available at: <http://cultura.estadao.com.br/noticias/geral,um-legado-a-duas-vozes,991959>. Access on: 13 Jul. 2017.

- To analyse the difference in the cognitive process between the two types of participants, by means of task duration, orientation, drafting, revision, segmentation, pause, micro translation unit, recursiveness, and meta-reflection;

- To assess the solutions the participants provided to selected linguistic features in the source text.

The aim was to test two hypotheses, namely:

1) The translation students, given their background of translation studies and translation strategies and techniques, will have a more expert-like behaviour and require less cognitive, temporal and technical effort than the English instructors;

2) The English instructors, given their previous knowledge of and esteem for Tolkien's work, will not see characters' names and Tolkien's peculiar writing as translation problems.

This senior thesis is divided into five chapters, including this Introduction. Chapter 2 presents the theoretical framework that supports the findings. Chapter 3 describes the methodology used for data collection and analysis. Chapter 4 analyses the data and discusses the results. Chapter 5 provides the final remarks, including limitations and suggestions for further studies.

2 THEORETICAL FRAMEWORK

Translation process research builds on a number of variables as a proxy of cognitive effort, including: pauses, micro translation units (TUs), fixation, recursiveness, and phases of the translation process.

Effort is

> a rarely defined term, which is usually associated with allocation of additional […] resources to accomplish a given task and often measured/identified by means of extreme, deviating values in any chosen parameter during task execution, such as time.[3] (DA SILVA, 2012, p. 18)

In Translation Process Research, effort can be identified using temporal, technical and cognitive measures (KRINGS, 2001). A common temporal measure of effort is pause. Pauses are cognitively relevant interruptions in the work flow of 2.4 seconds or longer (JAKOBSEN, 2005; FONSECA, 2012). They are key to identifying micro TUs.

> A micro TU is defined as the flow of continuous TT production—which may incorporate the continuous reading of source and TT segments—separated by pauses during the translation process as registered by key-logging and/or eye-tracking software. It can be correlated to a ST segment that attracts the translator's focus of attention at a given moment. (ALVES; VALE, 2011, p. 107)

A micro TU usually involve instances of fixation and recursiveness alongside ST (source text) understanding and TT (target text) production. Fixation is a cognitive measure, which consists of a type of eye movement often defined as a period of time during which the eye is relatively stable. The purpose of fixations is to bring an object of interest into visual focus (DUCHOWSKI 2007, p. 46). Fixations may be found on both ST and TT, and last 250 milliseconds on average in reading tasks (JAKOBSEN; JENSEN, 2008).

In their study, Carl et al. (2011) observed that the fixation count was equally divided between the ST and the TT during the process of translation, but the fixation duration was substantially higher on the TT. In contrast, Elming, Balling and Carl (2014) observed there was more gaze activity on the ST segment that was being translated at the time. Both studies approached non-fiction texts.

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[3] The author's translation to: "termo [...] raramente definido, mas geralmente associado à alocação de recursos [...] adicionais para realização de uma tarefa e, por vezes, mensurado / identificado através de valores extremos / desviantes para algum parâmetro relacionado com a execução da tarefa, como o tempo despendido."

Recursiveness encompasses deleting, mouse cursor movements, and copy and paste of text (BUCHWEITZ; ALVES, 2006). It may be associated either with technical effort when it involves correcting typos or with cognitive effort when it involves decision making as realized through different renditions to a particular translation problem (DA SILVA, 2012).

The translation process can be divided into three phases (JAKOBSEN, 2002): orientation (phase 1), drafting (phase 2), and revision (phase 3). Phase 1 starts when the ST appears on the screen and finishes when the first text production key is pressed. Phase 2 starts with the first text production keystroke and goes until the typing of the final punctuation mark (or equivalent keystroke, e.g. question mark). Phase 3 starts when the final punctuation mark is inserted for the first time and finishes when the option to save the translation is searched for or pressed.

In phase 1, the only operation which usually occurs is mouse clicks to scroll the ST and to resize the ST window. This phase consists of comprehension and cognitive preparation to produce the TT, but no typing of TT. The data provided by phase 1 indicates how much of the ST the translator looked at before starting to translate and how much time s/he spent on doing so. Jakobsen (2002) observed that phase 1 consists of a pause which is frequently longer than the following pauses in the drafting and revision phases. This difference in duration indicates the text processing that takes place at the outset is often of a different kind from that reflected by the shorter pauses found later in phases 2 and 3 – meaning that it may take longer to understand a text than to translate it.

In phase 2, all types of keystrokes can occur (JAKOBSEN, 2002), such as text production keystrokes (e.g., characters, spaces, and enter), text elimination keystrokes (e.g., delete and backspace.), cursor navigation keys, mouse clicks, and cut, copy, or paste operations. Text insertion is not even in this phase as the translator is often changing the text, correcting typos, deleting and replacing the text with new text (JAKOBSEN, 2002), and s/he sometimes halts the flow of text production while resorting to internal support to draw inferences and retrieve information from the memory or looking up various resources (e.g., dictionaries and the Internet) for external support (ALVES, 2000; GOTELIPE, 2007; MACHADO, 2007). These occurrences determine the individual's "cognitive rhythm", i.e., patterns of alternating between text production and pauses to make decisions and render the final product (cf. SCHILPEROORD, 1996, p. 5).

In phase 3, less text production occurs than in phase 2, because the translator is revising the text usually based on the TT with occasional look ups in the ST (CARL, 2012a, 2012b). This phase includes some reading of the ST, and "[k]nowledge resources may also be queried again in a renewed attempt to deal with unsolved problems or to validate a proposed solution" (JAKOBSEN, 2002, p. 193). In phase 3, text is deleted, corrected, punctuated and formatted. This phase lasts until the translator hits the save button to save and exit the software.

In phase 2, drafting, segmentation and pauses are indicative of the translator's cognitive effort, signalling their identification of translation problems and decision making. Dragsted (2004, 2005) points out the planning involved to solve problems requires more cognitive effort than any other planning activities, which means that the more complicated the problem, the longer the pause. The author states that the size and nature of a TU can be identified based on the pauses in the translation flow and can vary according to the translator's level of expertise and the difficulty level of the text. She says the average size of a TU is from two to four words, the ones longer than ten words being considered extremely long. She also points out novice translators tend to segment at the word level when facing an easy text, while expert translators segment at the clause or sentence levels. However, when facing a difficult text, both novice and expert translators tend to present a higher number of segments at the word level.

For Alves (2003) and Jakobsen (2003), cognitive segmentation is an indicative of how the subject behaves. Alves (2003) states if the translator works at the word level, it could be difficult to produce a coherent textual network. Buchweitz and Alves (2006) observed the most expert participants try at every moment to build a coherent textual network to create a more solid TT, which is apparent through increased recursiveness during phase 2. Buchweitz and Alves (2006) also observed that subjects with expert behaviour had more recursive movements during final revision than the other participants.

During phases 2 and 3, micro TUs are formed as the text is inserted following the translator's segmentation and pauses. Pauses occur because the translator needs to stop to gather more information to translate or because s/he has found a problem in the ST. For Alves and Vale (2009), micro TUs consist of specific segments of the cognitive process limited by the translator's pauses.

As mentioned in the Introduction, most studies on the translation process investigate such variables in the processing of scientific or news texts due to the shorter amount of time they

tend to require to be translated and due to their assumedly simpler structure and straightforward language use (e.g., JAKOBSEN, 2002; ALVES, 2003; FERREIRA, 2012; DA SILVA, 2007, 2012; SCHMALTZ et al., 2015). To the best of the author's knowledge, only two studies have addressed the process of literary translation, namely: Malta (2015) and Domingos (2016).

Malta (2015) analysed the (re)translation process of 14 participants. He used eye tracking and key logging while the participants rendered their versions of a Cortázar's short story drawing on the ST in Spanish and two previous published translations into Brazilian Portuguese. In his experiments, participants devoted more time to drafting, orientation and revision in this order, revision being the most heterogeneous phase across participants. Besides, the participants had more cognitive effort in processing and fixating on the TT than the ST. They occasionally fixated on the two previous translations provided as input.

Domingos (2016) keylogged her own process while translating four 55-word-long texts from *The World's Shortest Stories* by Steve Moss. Although she performed the tasks quickly and apparently had low effort, her analysis of the final product showed problems in identifying translation units that could have been avoided, had she devoted more time to orientation and revision. She concluded fast performance does not lead to expert-like performance, and monitoring one's own translation activity gives a perspective of where to improve the translator's training. Domingos (2016, p. 7) commented on her work:

> By reflecting upon her own translation process, the translator/author is capable of identifying drawbacks in her process, justify [*sic*] her decision making in facing translation problems and weigh [*sic*] about her needs to monitor her own translation process, especially when it comes to orientation, revision and translation units.

Monitoring the translation task—especially to identify translation problems or flaws in the translation process—is a procedure that an expert translator usually follows without realizing it. However, coming up with adequate solutions and making decisions requires further reflection. Alves (2003), Gonçalves (2003) and Jakobsen (2002), among others, point out expert translators seem to monitor more efficiently their translation processes. Their consecutive or retrospective reports reveal meta-reflections that are correlated to the final product and the translation process data observed through Translog[4]. Alves (2005) refers to meta-reflection as the translator's ability to monitor or manage his/her own translation process and reflect about it after the final product is ready.

[4] Available at: <https://sites.google.com/site/centretranslationinnovation/translog-ii>. Access on: 17 July 2017.

Monitoring is of essence for translating literary texts, which requires the mastery of several capabilities, such as

> … tone, style, flexibility, inventiveness, knowledge of the SL culture, the ability to glean meaning from ambiguity, an ear for sonority, and humility. Why humility? Because even our best efforts will never succeed in capturing in all its grandeur the richness of the original. (LANDERS, 2001, p. 8)

Landers (2001, p. 7, italics as in the original) pinpoints where exactly is the difficulty in coping with literary translation:

> One of the most difficult concepts about literary translations to convey is to those who have never seriously attempted it – including practitioners in areas such as technical and commercial translation – is that *how* one says something can be as important, sometimes more important, than what one says.

In other words, the manner of saying something is the key to literary translation.

3 METHODOLOGY

This chapter is divided into five sections. Section 1 describes the equipment and tools used to collect and analyse the data. Section 2 describes the choice of participants and their profiles. Section 3 explains the choice of the ST. Section 4 provides the variables and describes the methods for data analysis.

3.1 Equipment and Tools

Data from participants' gaze and keyboard activity during one translation task were collected using software Translog-II, version 1.0189, and Tobii Studio[5], version 3.3.2, connected to a Tobii X2-60 Compact remote eye tracker. Figure 1 shows the screen setting using Translog-II User interface. Double spaced ST was displayed in the top half of the application window, while double spaced TT was supposed to be inserted in the bottom half. Font type and size were Arial 16, respectively, for both ST and TT. Tobii Studio collected eye-tracking data, and Translog-II collected both key-logging and eye-tracking data (CARL, 2012a, 2012b).

The eye tracking device works by measuring the distance between the user's eyes and the screen. It is calibrated to calculate the way the eyes look according to the screen's size, format, and the distance between the user's eyes and the screen. Figure 1, retrieved from the software developer's website, shows how the device works.

To ensure gaze data accuracy, a calibration must be performed. It consists of following a dot (yellow in Translog-II or red in Tobii Studio) with the eye focusing on its centre (black dot) as it moves around the screen in random lines that end at the screen's borders or centre. Each software package has its own calibration system as exemplified in Figure 2. A 9-point calibration was used in this study for both packages.[6]

Data collection was performed at room 1G246 at Federal University of Uberlandia, campus Santa Monica. A 19" monitor was connected to a computer running 32-bit Windows 7 Professional, Service Pack 1, with an Intel Core i5, 3.33 GHz processor, and 4.0 GB RAM.

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5 TOBII. Available at: <https://tobiigaming.com/getstarted/>. Access on: 17 July 2017.

6 A tutorial on how to run Translog II with Tobii can be found on Translog II's developer page and on Youtube, respectively at: <https://sites.google.com/site/centretranslationinnovation/translog-ii.> and <https://www.youtube.com/watch?v=ctRzSV0EiAQ&feature=youtu.be>. Access on: 1 July 2017.

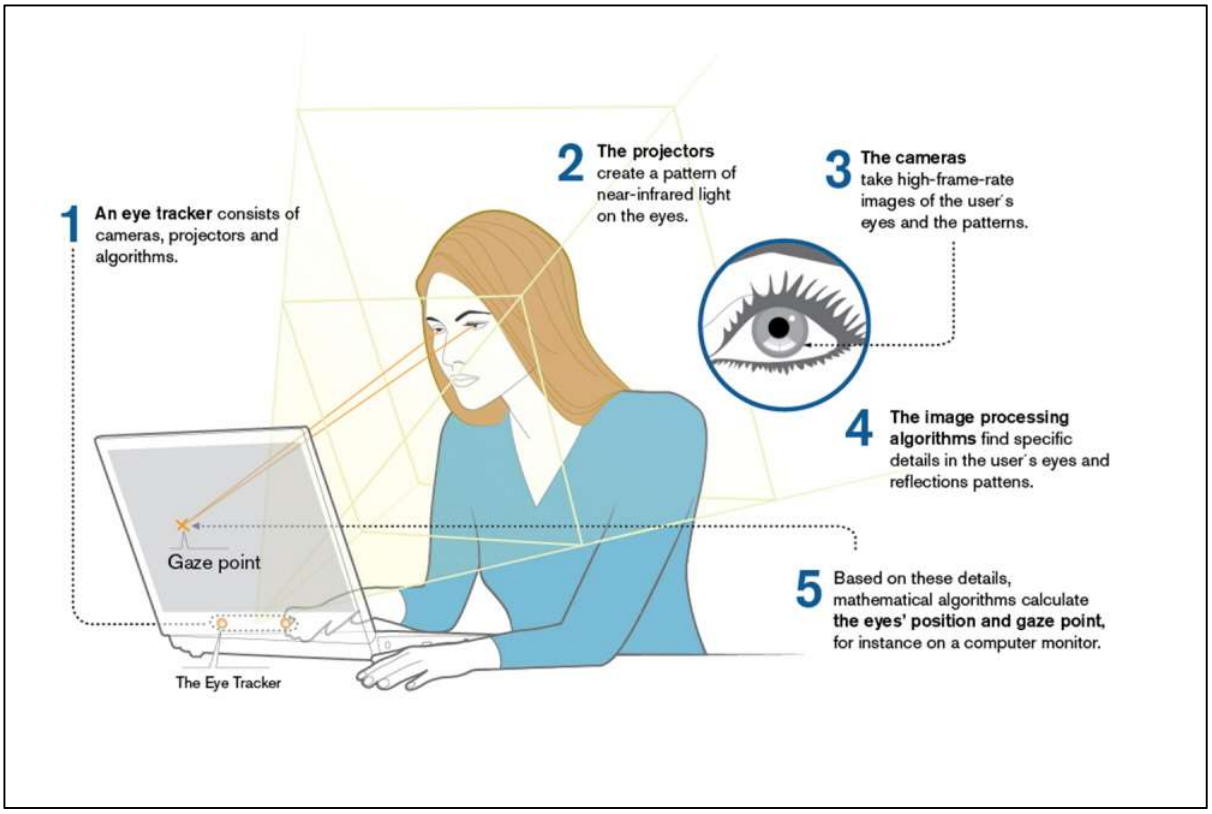

Figure 1 – How eye tracking works

Source: Tobii Studio.[7]

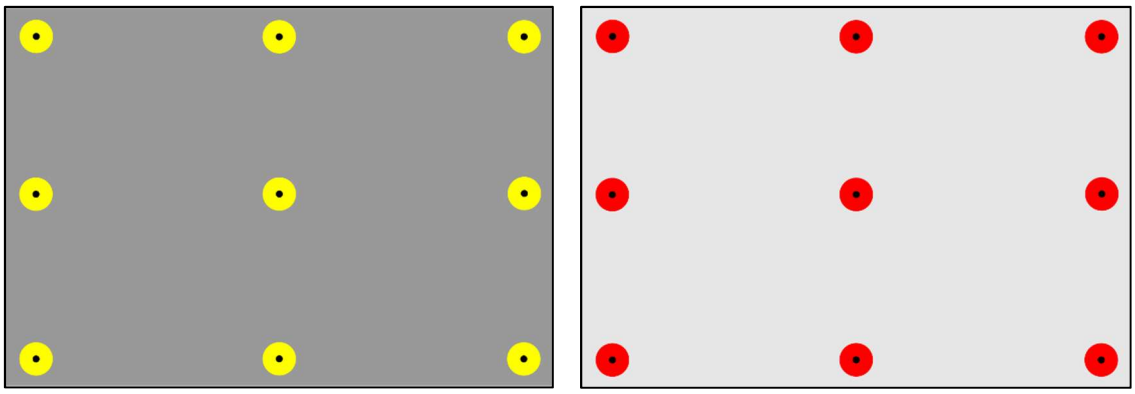

Figure 2 – Translog-II calibration (a) and Tobii Studio calibration (b)

Source: the author.

According to the Business Dictionary[8], the word "experiment" designates a

> research method for testing different assumptions (hypotheses) by trial and error under conditions constructed and controlled by the researcher. During the experiment,

[7] Source: TOBII. Available at: <https://www.tobii.com/group/about/this-is-eye-tracking/>. Access on: 1 Jul. 2017.

[8] Source: THE BUSINESS DICTIONARY. Experiment. Available at: <http://www.businessdictionary.com/definition/experiment.html>. Access on: 22 July 2017.

> one or more conditions (called independent variables) are allowed to change in an organized manner and the effects of these changes on associated conditions (called dependent variables) is [*sic*] measured, recorded, validated, and analyzed [*sic*] for arriving at a conclusion.

This study relies on an experiment and is classified as a controlled experiment, since it was performed in a laboratory under controlled conditions.

3.2 Participants

The sample includes data 6 from participants aged 23-24 years old. All participants had experience in translation.

The sample included 2 males and 4 females. Three were senior undergraduate students of Translation and three were English Instructors who were enrolled in different undergraduate programs (i.e., Biology, Dentistry, and Chemical Engineering). All of them were recruited by this thesis author and were students at the Federal University of Uberlandia. They were chosen due to their willingness to translate a literary text and their alleged fluency in English. The English instructors were also chosen because of their knowledge of and esteem for Tolkien's work.

The participants were asked not to wear glasses due to reflection and interference with eye-tracking data collection. However, E3 wore contact lenses, and T3 and E1 needed to wear glasses during the experiment. They sat approximately 50-60 cm from the monitor in an artificially lighted laboratory. All of them signed an informed consent (cf. Appendix 1). All participants were addressed to in Brazilian Portuguese at all times.

Given the exploratory nature of this study, all data were included in the sample irrespective of eye-tracking data quality (HVELPLUND, 2011). For this reason, the fixation analyses focus on comparing ST and TT, rather than inferring from numerical differences between participants.

3.3 Experimental Text

The experimental text was a 134-word-long excerpt from Tolkien's *Unfinished Tales.* It stems from chapter *The Death of Glaurung* and is as follows:

> ‘Hail, Nienor, daughter of Húrin. We meet again ere the end. I give thee joy that thou hast found thy brother at last. And now thou shalt know him: a stabber in the dark, treacherous to foes, faithless to friends, and a curse unto his kin, Túrin son of Húrin! But the worst of all his deeds thou shalt feel in thyself.’
>
> Then Nienor sat as one stunned, but Glaurung died; and with his death the veil of his malice fell from her, and all her memory grew clear before her, from day unto day, neither did she forget any of those things that had befallen her since she lay on Haudh-en-Elleth. And her whole body shook with horror and anguish. But Brandir, who had heard all, was stricken, and leaned against a tree.

The choice of book was not random—it was chosen out of personal admiration and because of the writer’s peculiar language use. However, the choice of the excerpt to be translated was random: The book was opened, and the first intelligible excerpt that was looked upon was the one used in the experiment. The excerpt length was decided based on Translog’s translation screen size, so that the participants would not have to scroll the page up or down to read the ST and the TT, otherwise it would interfere with the eye tracking data.

The text chosen presents linguistics challenges for the translator such as use of Middle English (e.g., “thou,” “shalt,” “befall,” “thyself”) and a creativity challenge, since it is a literary text. Another challenge is the fact that there is a published translation in Brazilian Portuguese, which presents all the names that are currently used for the characters and places. The already established nomenclature should not be ignored, since it is already incorporated into the fan’s vocabulary and is a reference in Brazilian Portuguese.

3.4 Task Execution

As a brief, the participants were informed they should render a text aimed at publishing in the Brazilian market. They were told to feel free to produce their own TTs without any time constraint. In addition, because of the nature of the task, they were also allowed to use any kind of translation aids or to leave the Translog-II window.

After performing the task, the participants were asked to answer six questions as follows:

1. What was difficult?
2. What was easy?
3. Did you know the text or the author?
4. Do you want to comment on your word choices?
5. Were you familiar with the Middle English?

6. How many characters did you identify? Who were they?

The objective of such questions was to evaluate how much information the participants would remember from the text and if their previous knowledge of the author would help them through the task.

3.5 Variables and Data Analysis

What characterizes an experiment is the presence of variables. They can be controlled, dependent, or independent. Table 1 summarizes the variables of this study, showing the type of variable and what it is.

Table 1 – Variables analysed in the study

Type of variable	Variable
Controlled	Text type
	Possibility of online search
	No time pressure
	Use of Translog-II User interface to translate the text
Dependent (for the process)	Task duration (seconds)
	Time distribution among phases (percentage)
	Orientation (fixation count, total fixation duration)
	Drafting (fixation count, total fixation duration)
	Revision (fixation count, total fixation duration)
	Online search (fixation count, total fixation duration)
	Pauses (number and duration)
	Recursiveness (number of insertions and deletions)
	Micro TUs (number)
	Segmentation (number of words)
Dependent (for the product)	Archaism, dialogue marks, and gender/species
Independent	Participants' profile

Source: the author.

Keyboard activity data were analysed using software packages LRSB[9] and MicroUnits[10]. They provided pause durations, number of micro TUs as delimitated by pauses of 2.4 seconds or longer, the number of insertions, the number of deletions (a measure of recursiveness), and linear representations.

Gaze data were analysed using software Tobii Studio, which provided gaze maps, heat maps, and statistics. The identification of phases 1 (orientation), 2 (drafting) and 3 (revision) was performed visually using Tobii Studio and building on the definitions provided in Chapter 2. To delimitate phases, scenes were created on the software while replaying the recordings and isolating look-ups. ST and TT were defined as areas of interest (AOIs) to identify fixation counts and total fixation durations).

To assess the solutions the participants provided to some linguistic features in the ST, their TTs were examined as to (1) their renditions for archaisms, (2) their use of dialogue marks, and (3) their recognition of a character's gender (i.e., Nienor). Participants' answers to the question "How many characters did you identify? Who were they?" were also used to complement analysis (3).

[9] SILVA, Gabriel Eduardo; DA SILVA, Igor. Linear Representation Spreadsheet Builder. Available at: <https://github.com/MetadataConsulting/spreadsheet-builder> . Access on: 17 July 2017.

[10] Available at: <https://github.com/gabrieleduardo/MicroUnits>. Access on: 17 July 2017.

4 DATA ANALYSIS AND DISCUSSION OF RESULTS

This section is divided into eight sections. Section 4.1 compares the total time it took the participants to perform the translation task and the time distribution throughout the phases. Sections 4.2, 4.3 and 4.4 reports on the results for the orientation, drafting, and revision phases, respectively. Section 4.5 analyses the amount of time spent on search by each participant. Section 4.6 focuses on Micro TUs, pauses, and recursiveness. Section 4.7 draws on segmentation. Section 4.8 assesses some linguistic features in the TTs. Section 4.9 analyses the data collected in the retrospective reports.

4.1 Task Duration and Time Distribution among Phases

Table 2 shows the total time it took each participant to perform the translation task.

Table 2 – Total task duration per participant

Participant	Total task duration (sec)
T1	1,467
T2	1,365
T3	2,402
E1	915
E2	924
E3	1,498

Source: the author.

The English instructors took on average less time to perform the translation task than the translators (1,112 vs. 1,7445 secs, which corresponds to a difference of approximately 10,5 minutes). In isolating extreme results for each group (e.g., T3 and E3), the difference in time between the English instructor who took more time to perform the task (e.g., E2) and the Translation student who took less time to perform the task (T2) is 441 seconds, corresponding to approximately 7 minutes. In minutes, the lowest duration was approximately 15 minutes, whereas the longest duration was approximately 40 minutes.

Figure 3 shows how the total task duration was distributed in each translation phase.

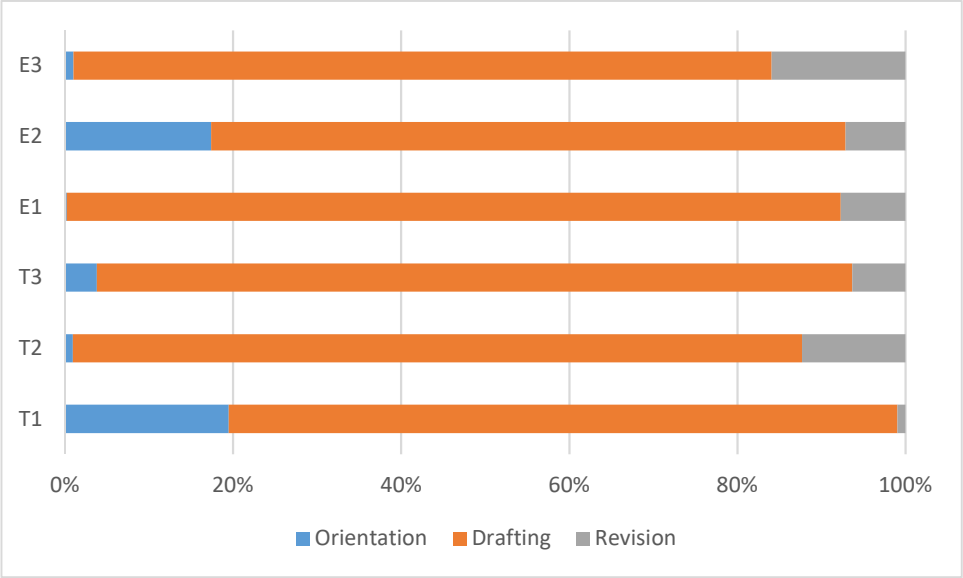

Figure 3 – Time distribution in each phase of the translation process.

Source: the author.

Time distribution across the translation process was heterogeneous across participants, especially in the orientation phase. While T1 and E2 spent nearly 20% of the total task time on orientation, T2, E1 and E2 devoted virtually no time to reading the ST and preparing for the task. Such heterogeneity is consistent with reports in the literature (e.g., JAKOBSEN, 2002; DA SILVA, 2012; MALTA, 2015).

4.2 Orientation

In phase 1 (orientation), Jakobsen (2002) observed that exclusive attention to the ST is to be expected because the translator is getting ready to start to work, that is, this phase consists of comprehension and cognitive preparation to produce the TT, but no typing of TT. The translator is expected to read the whole excerpt and have a higher focus on problematic words of the text. That did not happen to every participant, as half of them did not read the excerpt before starting to translate (i.e., Translation student T2, and English instructors T3 and E3).

In the experiment herein reported, scrolling and adjustment of the text were not needed, since the provided ST consisted of two paragraphs which fit half page. The heat map and the gaze plot in Figure 3 prove that the translator did not read before starting to translate.

The heat map presents three colours, with the number of fixation increasing from green to yellow to red. The gaze plot provides the order of fixations on the screen. The tables contain the number of fixations and their total time.

a) b)

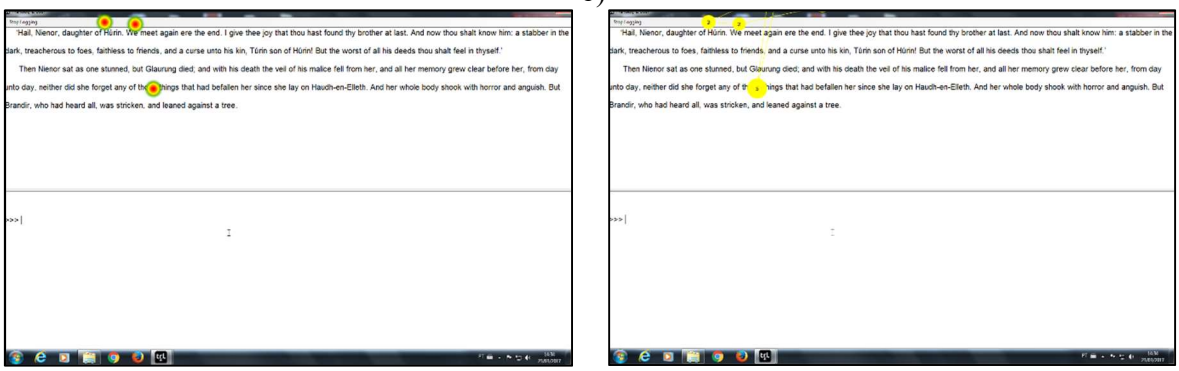

Figure 4 – Heat map (a) and gaze plot (b) of the orientation from E1

Source: the author.

In contrast, T3 and E3 started searching for words during the orientation process. However, after reading half of the text, they started to translate it. Figures 5 is illustrative of such a behaviour.

a) b)

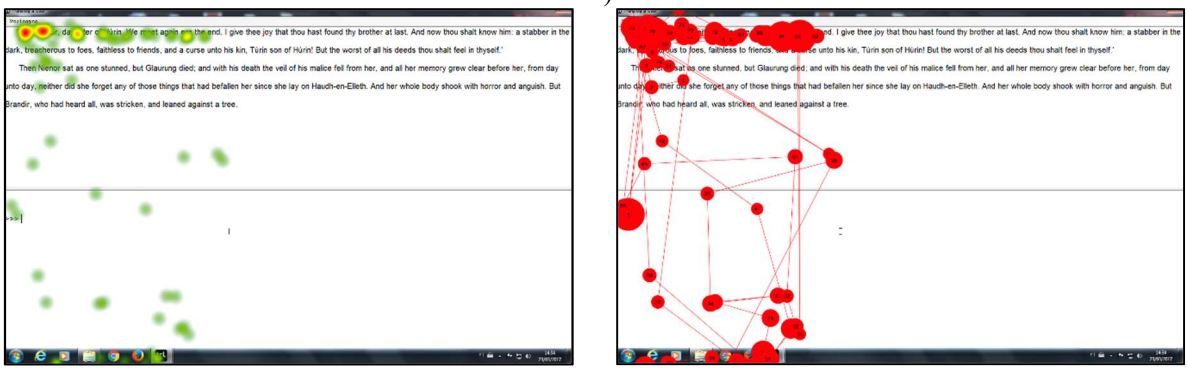

Figure 5 – Heat map (a) and gaze plot (b) of the orientation from T3

Source: the author.

The data illustrated by the heat maps and gaze plots is corroborated by the statistical data provided by Tobii Studio. Table 2 shows the statistical data from all participants regarding phase 1 (orientation).

Table 3 – Fixations on ST during phase 1 (orientation)

Part	Fixations (count)	Mean fix (sec)	Sum fix (sec)	StDev (sec)
T1	221	0.15	33.52	0.10
T2	11	0.29	3.15	0.15
T3	88	0.23	20.12	0.17
E1	2	0.32	0.63	0.21
E2	159	0.41	64.48	0.41
E3	15	0.10	1.55	0.03
AllRec	496	0.25	123.46	0.28

Note: Part = Participant, Fixations = Fixation number, Mean fix = Mean fixation duration, Sum fix = Sum of fixation durations, StDev = Standard deviation of fixation durations, AllRec = All Recordings.

Source: the author.

Only T1, T3 and E2 read the excerpt before starting to translate, as can be observed by their number of fixations (e.g., 221, 88, and 159, respectively) and their sum of fixation durations (e.g., 33.52, 20.12, and 64.48, respectively). By using the lowest number of the three participants as a reference, it would take at least 88 fixations and 20 seconds to scan or read the entire text.

4.3 Drafting

Not reading the excerpt before starting the translation may not have influenced the TT itself, but it could have saved time and cognitive effort in the drafting phase, which was the longest phase for all participants and featured several instances of lookups (cf. Section 4.5).

Figures 6 and 7 show the heat maps of the drafting phase of E1 and T3 and are illustrative of how much participants fixated on both ST and TT. They are also indicative of where participants focused most of their attention. In eye tracking studies, the assumption is that fixating more on a part of the text is indicative of cognitive effort to process that particular part (JUST; CARPENTER, 1980).

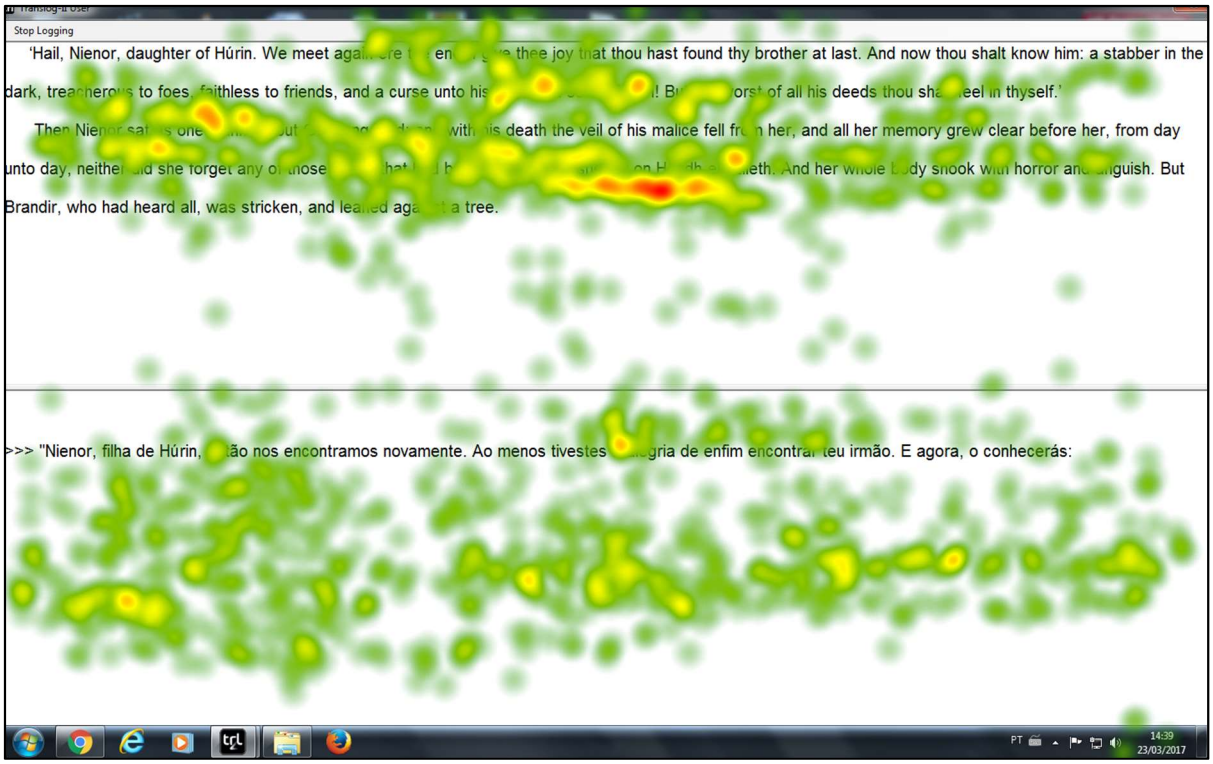

Figure 6 – Heat map of the drafting from E1

Source: the author.

Figure 7 – Drafting heat map from T3

Source: the author.

As posited by Jakobsen (2002), translators are expected to focus a little more on the ST than on TT in the drafting phase, since there is a need to consult the ST all of the time when performing a translation, but high attention is directed to the TT too. This expectation was observed in the results shown in Figures 6 and 7, which is also consistent with Elming, Balling and Carl's (2014) results, but opposite to reports by Carl et al. (2011).

Figures 6 and 7 are also indicative of where in the ST participants had more cognitive effort (cf. red spots). Most of the participants' fixations was placed on the second paragraph, especially on the names of characters (e.g., Nienor) and places (e.g., Haudh-en-Elleth). T3's and T3's heat maps are similar to those related to the remaining participants from the sample.

Tables 4 and 5 provide the statistics for fixations on the ST and the TT in phase 2 (drafting), respectively. They contain, among others, the total number of fixations and the total fixation time. As visually observed in the heat maps, a contrastive analysis of the tables confirms that all participants did fixated more often and longer on the ST than on the TT. However, this result runs counter the findings reported by Malta (2015), who found more fixations on the TT in the process of translating a literary text. An explanation may rest on the text's assumed difficulty, which required much cognitive effort from the participants to be understood.

Table 4 – Fixations on ST during phase 2 (drafting)

Part	**Fixations (count)**	**Mean fix (sec)**	**Sum fix (sec)**	**StDev (sec)**
T1	689	0.13	92.40	0.06
T2	790	0.24	187.99	0.14
T3	1331	0.20	267.50	0.13
E1	901	0.19	170.49	0.15
E2	671	0.22	150.22	0.18
E3	702	0.13	91.69	0.07
AllRec	5084	0.19	960.29	0.14

Note: Part = Participant, Fixations = Fixation number, Mean fix = Mean fixation duration, Sum fix = Sum of fixation durations, StDev = Standard deviation of fixation durations, AllRec = All Recordings.

Source: the author.

Table 5 – Fixations TT during phase 2 (drafting)

Part	TT			
	Fixations (count)	**Mean fix (sec)**	**Sum fix (sec)**	**StDev (sec)**
T1	368	0.12	44.29	0.07
T2	408	0.25	101.17	0.23
T3	1044	0.20	204.77	0.18
E1	450	0.14	63.45	0.09
E2	522	0.25	129.11	0.25
E3	326	0.10	33.69	0.05
AllRec	3118	0.18	576.48	0.18

Note: Part = Participant, Fixations = Fixation number, Mean fix = Mean fixation duration, Sum fix = Sum of fixation durations, StDev = Standard deviation of fixation durations, AllRec = All Recordings.

Source: the author.

4.4 Revision

In phase 3 (revision), a higher focus is expected on the TT, since the translator is revising the translation and is not so dependent upon the ST anymore. Jakobsen (2002) stated the translators are expected to revise their entire work before deeming it complete, but some do not. This was the case of one Translation students and one English instructors (i.e., T1 and E2, respectively), who deemed their task complete shortly after the drafting phase.

An ideal revision can be illustrated by the process of T2, that is, there is higher focus on the TT and all of it is read (cf. Figure 8). Both gaze plot and heat map shows that little no attention was paid to the ST, since in this phase the translator is checking whether the translation contains typos and if it is suitable for publishing as required in the task brief.

a) b)

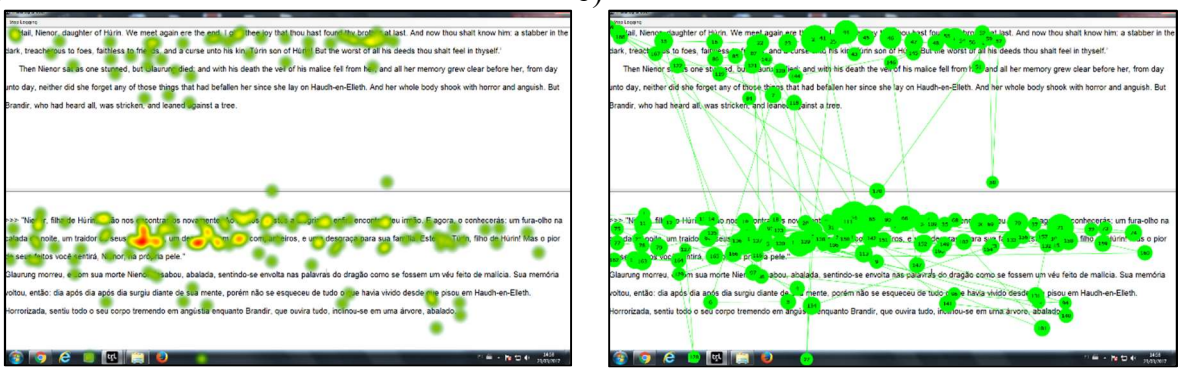

Figure 8 – Heat map (a) and gaze plot (b) of the revision from T2

Source: the author.

Jakobsen (2002) observed that in phase 3 (revision) text is deleted, corrected, punctuated and formatted. When there was revision, the Translation students (cf. T2 and T3) took a little longer than the English instructors (cf. E1 and E3) fixating on both ST and TT to revise the final product (37 secs. vs. 30 secs. on average). Tables 6 and 7 confirm these observations, but notice that the differences are not meaningful when considering that the Translation students spent much longer to complete the task than the English instructors (cf. Table 2).

Table 6 – Fixations on ST during phase 3 (revision)

Part	ST			
	Fixations (count)	**Mean fix (sec)**	**Sum fix (sec)**	**StDev (sec)**
T1	1	0.08	0.08	-
T2	48	0.23	11.02	0.11
T3	40	0.15	6.11	0.11
E1	68	0.14	9.67	0.10
E2	5	0.18	0.91	0.04
E3	109	0.11	12.35	0.06
AllRec	271	0.15	40.14	0.10

Note: Part = Participant, Fixations = Fixation number, Mean fix = Mean fixation duration, Sum fix = Sum of fixation durations, StDev = Standard deviation of fixation durations, AllRec = All Recordings.

Source: the author.

Table 7 – Fixations on TT during phase 3 (revision)

Part	TT			
	Fixations (count)	**Mean fix (sec)**	**Sum fix (sec)**	**StDev (sec)**
T1	12	0.13	1.53	0.06
T2	127	0.24	29.98	0.12
T3	159	0.17	27.14	0.18
E1	79	0.13	9.89	0.06
E2	114	0.22	25.47	0.21
E3	119	0.10	11.70	0.04
AllRec	610	0.17	105.71	0.15

Note: Part = Participant, Fixations = Fixation number, Mean fix = Mean fixation duration, Sum fix = Sum of fixation durations, StDev = Standard deviation of fixation durations, AllRec = All Recordings.

Source: the author.

T1 did not revise the final product. E1 and E3 had a more even fixation distribution between the AOIs. The remained (i.e., T2, T3, and E2) paid higher attention to the TT, as it is expected in this phase, according to Jakobsen (2002).

4.5 Search

Table 8 provides the total number of fixations and the total fixation time for each participant during online search, which occurred in all three phases of the translation process, especially in the drafting phase.

The Translation students took longer in their search fixations, which may account for their longer total task durations, especially T3's. This participant is responsible for half of the total fixation duration spent by the entire sample on online searches (over 9 minutes, or 555.76 out of 1087.84 secs.) and had the longest total task duration time (approximately 2402 secs, or approximately 40 minutes).

Table 8 – Fixations during online search

Part	Fixations (count)	Mean fix (sec)	Sum fix (sec)	StDev (sec)
T1	430	0.13	56.76	0.07
T2	1205	0.23	280.07	0.17
T3	3003	0.19	555.76	0.13
E1	300	0.19	56.09	0.17
E2	416	0.23	96.42	0.16
E3	361	0.12	42.75	0.06
AllRec	5715	0.19	1087.84	0.14

Note: Part = Participant, Fixations = Fixation number, Mean fix = Mean fixation duration, Sum fix = Sum of fixation durations, StDev = Standard deviation of fixation durations, AllRec = All Recordings.

Source: the author.

4.6 Pauses and Recursiveness per Micro TU

Table 9 provides the figures for pauses, insertions, and deletions of each participant per micro TU. It was split into two tables for comparison purposes, with Table 10 showing the figures for the Translation students, and Table 11 showing the figures from the English instructors.

Table 9 – Pauses, insertions, and deletions per micro TUs from each participant

Part	Mp	Mpd	Tpd	Mi	Ti	Md	Td
T1	14.947	19,767	1245,373	14.571	918	2.587	163
T2	14.637	19,671	1298,347	13.621	899	1.893	125
T3	19.597	24,614	2362,946	10.604	1018	1.843	177
E1	10.995	17,603	844,947	20.125	966	4.854	233
E2	12.201	23,262	907,248	21.615	843	2.743	107
E3	21.091	28,139	1294,405	20.847	959	2.913	134

Note: Part = Participant, Mp = Mean pauses (count), Mpd = Mean pause duration (seconds), Tpd = Total pauses duration (seconds), Mi = Mean insertions (count), Ti = Total insertions (count), Md = Mean deletions (count).

Source: the author.

Table 10 – Pauses, insertions, and deletions per micro TUs from the Translation students

Part	Mp	Mpd	Tpd	Mi	Ti	Md	Td
T1	14.947	19,767	1,245,373	14.571	918	2.587	163
T2	14.637	19,671	1,298,347	13.621	899	1.893	125
T3	19.597	24,614	2,362,946	10.604	1018	1.843	177
Tm	16.393	21,350	1,635,555	12.932	945	2.107	155

Note: Part = Participant, Mp = Mean pauses (count), Mpd = Mean pauses duration (seconds), Tpd = Total pause duration (seconds), Mi = Mean insertions (count), Ti = Total insertions (count), Md = Mean deletions (count), Td = Total deletions (count), Tm = Total mean.

Source: the author.

Table 11 – Pauses, insertions, and deletions per micro TUs from the English instructors

Part	Mp	Mpd	Tpd	Mi	Ti	Md	Td
E1	10.995	17,603	844,947	20.125	966	4.854	233
E2	12.201	23,262	907,248	21.615	843	2.743	107
E3	21.091	28,139	1,294,405	20.847	959	2.913	134
Tm	14.762	23,001	1,015,533	20.862	923	3.503	158

Note: Part = Participant, Mp = Mean pauses (count), Mpd = Mean pauses duration (seconds), Tpd = Total pauses duration (seconds), Mi = Mean insertions (count), Ti = Total insertions (count), Md = Mean deletions (count), Td = Total deletions (count), Tm = Total mean.

Source: the author.

Overall, Translation students had more but shorter pauses than the English instructors (cf. columns “Mp” and “Mpd”, respectively). The reason is that English instructors used each pause to lookup for more than one translation problem, whereas the Translation students alternated between translation and online search, looking for one solution at a time. Therefore, the Translation students’ behaviour was more effortful than that of the English instructors.

T3 and E3 were the participants who had more and longer pauses. This result is particularly consistent with that for T3 with regards to her fixation for online search (over 9 minutes, as shown in Section 4.5). In other words, T3 tended to resort to external support in their pauses, while this was not necessarily the case for E3, who had the shortest fixation duration for online searches (approximately 43 secs.).

Table 11 also shows the English instructors and the Translation students tended to insert and delete similar amounts of texts (cf. columns “Ti” and “Td”, respectively), but the English instructors inserted more text in each micro TU than the Translation students did (cf. column “Mi”). This means the English instructors’ micro TUs were longer than those produced by the Translation students. In other words, as for this parameter, Translation students had to devote more effort than the English instructors to complete the task.

In the translation process, micro TUs are formed as the text is inserted. Alves and Vale (2009, p. 258) associate the analysis of TUs with expertise patterns, with the length and number of micro TUs varying according to the translator’s level expertise. They observed that the more words the TUs contained, the higher the level of the translator’s expertise. In other words, the English instructors had a more expert-like behaviour than the Translation students.

4.7 Segmentation

Table 12 informs on the number of segments and the number of words per segment that each participant produced during phases 2 and 3 (respectively drafting and revision, if the latter occurred).

Table 12 – Mean number of segments and words per segments

Participant	Number of segments	Words per segment
T1	65	3.14
T2	66	3.03
T3	96	2.50
E1	48	4.31
E2	39	4.53
E3	46	4.71

Source: the author.

Based on Alves and Vale (2009) and on Dragsted (2004, 2005), the higher the number of segments is, the higher the cognitive effort is. Hence, the task was more effortful to the Translation students, especially T3, than to the English instructors.

In addition, Table 12 shows that the higher the number of segments, the lower the size of the segment. Consistent with Dragsted (2004, 2005), segments tend to have from 2 to 4 words and

segmentation at lower levels (i.e., with lower number of words) is indicative of more cognitive effort. Thus, once again the task was more effortful to the Translation students, especially to T3, than to the English instructors.

Figure 9 is illustrative of how T3 segmented his task. The number in red represents the time it took the participant to start writing the next TU (in milliseconds), the writings in blue are text inputs (TUs), the writings in green represent deletions, and the black arrows represent cursor movement. The first pause (e.g., 136797) represents phase 1 (orientation), that is, the time it took the translator to start translating.

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Figure 9 – Linear representation of T3's translation process

Source: the author.

Such a linear representation shows how the participant segmented at a lower level, with some segments containing only one word (e.g., “Saudações” and “assombrada”). However, a few larger segments can also be observed, such as “dia após dia, não comente ela” and “não nenhuma dessas coisas como ela”).

4.8 Final Product

The published translation in Brazilian Portuguese of *Unfinished Tales* was produced by Ronald Eduard Kyrmse and published in 2002. He is a Brazilian scholar who investigates Tolkien and founder of the first Brazilian Tolkien Society in 1989, called Heren Hyarmen (changed in 2003 to Heren Hyarmeno). He translated most of Tolkien’s books that have been published in Brazilian Portuguese and is also a member of the Tolkien Society. His published translation in Brazilian Portuguese of the excerpt analysed in this work is as follows:

> – Salve, Nienor, filha de Húrin. Mais uma vez nos encontramos antes do fim. Concedo-te alegria por teres encontrado teu irmão afinal. E agora o conhecerás: o que apunhala no escuro, traiçoeiro com os inimigos, desleal com os amigos, e uma maldição para sua família, Túrin, filho de Húrin! Mas o pior de todos os seus feitos hás de sentir em ti mesma.
>
> Sentou-se então Nienor como que atordoada, mas Glaurung morreu; e com sua morte o véu de sua maldade desprendeu-se dela, e todas as suas lembranças se aclararam, dia após dia. Nem esquecera nada do que lhe havia acontecido desde que se deitara no Haudh-en-Elleth. E todo o seu corpo estremeceu de horror e angústia. Mas Brandir, que tudo ouvira, ficou estupefato e encostou-se a uma árvore.

The excerpt above shows how Kyrmse dealt with the dialogue mark in the first paragraph, referred to Nienor as a female character in using the female adjective “atordoada” (i.e., “stunned”) in the second paragraph, and opted for “tu” and “teu” as formal correspondents to “thou” and “thy”.

As for the dialogue mark, T2 and T3 used inverted commas, E2 used a hyphen mark, while the remaining participants rendered the whole paragraph as narrator’s voice, rather than a character’s voice. As for the adjective for the female character Nienor, E1 mistook the gender (i.e., “atordoado”). Interestingly, this participant did not look for the names of characters and places mentioned in the ST.

In addition, a pattern was observed amongst the Translation students: they all opted for “tu” forms as formal correspondents for the English “Thou” forms, while the English instructors used “você”. “Você” is a recently used way to address other people in Brazilian Portuguese

(PERES, 2007), and was not expected as a rendition amongst the participants, let alone the English teachers. E1 claimed that not using "tu" was an attempt to produce a translation that would fit the 21st century, since "tu" is rarely used nowadays in most regions of Brazil. That was a legit attempt, but seems to strip Tolkien's work of all its peculiarity.

All participants reported they had a problem with the type of text, even the ones who know Tolkien's stories and peculiar way of writing. Most participants did not have an experience in translating literary text or in the use of Middle English, as they all said during the retrospective reports. They also claimed there was nothing easy about the translation and there were some words they had never seen before.

4.9 Retrospective Reports

The participants had not much to comment on their own translation process, which is indicative of a low level of meta-reflection, as concluded by Alves (2005). The author found out that the higher the level of meta-reflection, the higher the translator's level of expertise, especially in the revision phase, when meta-reflection is more intense.

The only part of the reports that seemed to be insightful for the purposes of this study was that related to question "How many characters did you identify? Who are they?" The answers were rather short and lacked meta-reflection, and the participants often did not remember the names of all the characters from the excerpt they had just translated. The transcripts to such question are provided below. While commenting on their translations, the participants did not have access to their final product.

> **T1:** There's Nienor. Húrin doesn't show up, but there's him too. There's Glaurung, who's the dragon. There's Nienor. Oh, no, I've already spoken about her. Let me see here, there's Brandir, who's there observing.
> Total of identified characters: 4

> **T2:** I identified three characters. No, not three, there are more, right? There's the lady whose name I don't remember, the lad, the son, and the daughter. So there are four, I think.
> Total of identified characters: 4

> **T3:** I identified three characters. The daughter, her brother, whose name I don't remember 'cause I don't know who he is, their father, the person who says the first sentence, and the person who leaned on the tree. So there are 5 actually. I don't remember the names. Niendor (with an additional *n*)? Ha-ha. No, they're too different.
> Total of identified characters: 5

> **E1:** I identified two characters. There is the Nienor one [referred to as a male through the article in Portuguese]. No, wait, three. Nienor, the brother, wait there's that one who's the grave of someone. I think there are two. I didn't pay attention. No, there's Nienor, Glaudrung [referred to as a female through the article in Portuguese and with an additional *r* in its name], and there's Brandir, who saw her crying. Now I don't know if anyone's buried on that grave.
> Total of identified characters: 3
>
> **E2:** I'm not going to remember the names, but there was the guy who was dying, who died telling the girl she had found her brother, so there are two there. There was one watching the scene, I can't deduce if her brother was there or if the guy who was talking before dying was talking about something that happened before, but her brother wasn't there. But that I really cannot know, but the other three I am sure about.
> Total of identified characters: 3
>
> **E3:** There was the person who was speaking. Hmm if I could only read. Ha-ha. There's a lady, daughter of Hurín, and there's the guy who died. I don't know how to say his name. There's the guy who listened to everything and got stricken. Ha-ha. That's it, four people.
> Total of identified characters: 4

The excerpt presented five characters: Nienor (female—daughter of Húrin), Túrin (male—son of Húrin), Húrin (male—father to Nienor and Túrin), Glaurung (male—a dragon) and Brandir (male—Nienor's journey companion). A place called Haudh-en-Elleth is also mentioned, but should not be identified in a question regarding characters, like E2 did in his answer.

Interestingly, none of the participants but T3 could remember all characters or their respective names. This shows they did not focus much on understanding what they were translating, with gender/species mistakes occurring in several translations (e.g., Nienor was referred to as a man by E1; the dragon Glaurung referred to as a man by T2, T3, E2, and E3, and as a woman by E1). This type of mistake may have not happened if all participants had looked for the characters on the Internet. The participants understood the excerpt overall, that is, it was a dialogue and someone died (Glaurung, the dragon, died), even though not all of them used a dialogue mark (see Section 4.8). When asked, E1 even claimed attention was not paid to the names.

T2 claimed the translation was performed as quickly as possible, despite the lack of time restriction involved in the translation task. This behaviour is similar to that reported by Domingos (2016), who assumed being quick was an expert behaviour and therefore performed her translations as quickly as possible. However, her results were not satisfactory, since the translations contained several mistakes. The author then concluded that being fast is not the only characteristic of an expert in a translation task. Rather, expertise joins all the translator's abilities, such as understanding what is being translated in order to save cognitive effort during the process, searching effectively, knowing how to use translation tools in order to save typing

time etc. Meta-reflection is part of being an expert too, because once the translator starts to reflect upon her/his work, s/he starts to realize the mistakes, correcting them and self-monitoring her/his work flow.

5 FINAL REMARKS

This senior thesis aimed to analyse the difference in the cognitive processes and translation products of two groups of participants, namely: Translation students and English instructors. To this end, the analyses were built on the participants' orientation, drafting, revision, segmentation, pause, micro TU, recursiveness, and meta-reflection, and supplemented with some notes on the linguistic features in their final products.

The first hypothesis tested in this study was that the Translation students would have a more expert-like behaviour and require less cognitive, temporal and technical effort than the English instructors. To draw a conclusion about this hypothesis, Table 13 summarizes the process data from Chapter 4, showing how the participants devoted effort to the task according to some of the parameters reported in that chapter. Cells with "+" mean high cognitive effort compared to the remainder of the sample.

Table 13 – Mean number of segments and words per segments

Parameter	T1	T2	T3	E1	E2	E3
Task duration	-	-	+	-	-	+
Orientation	+	-	+	-	+	-
Revision	-	+	+	+	+	+
Search	-	+	+	-	-	-
Pauses	-	-	+	-	-	+
Micro TUs	+	+	+	-	-	-
Segments	+	+	+	-	-	-
Words per segment	+	+	+	-	-	-
Total count	4	5	8	1	2	3

Source: the author.

The Translation students devoted more effort to perform the translation, as evinced in at least half of the measures, especially those related to key-logging activity (i.e., micro TUs, segments and words per segments). T3 had high cognitive effort compared to all the remaining participants in all parameters, while E1 seemed to perform the task smoothly.

However, a look at some linguistic features in the TTs shows that the translation students' effort seemed to pay off, as T2 and T3 used a dialogue mark, T3 could remember all characters, and all of them opted for "tu" forms. In contrast, only E2 used a dialogue mark, E1 and E2 were the

participants who remember the lowest number of participants, and E1 mistook some participants' genders and species. In other words, the hypothesis that the English instructors, given their previous knowledge of and esteem for Tolkien's work, would not see characters' names and Tolkien's peculiar writing as translation problems was refuted.

These findings seem to evince translation is an ill-defined problem to which low effort not necessarily means translation quality, especially when it comes to literary translation and novice translators. This is consistent with Domingos' (2016) account of her own translation process. Monitoring and meta-reflection seems to be key in performing translation tasks adequately.

This research is, therefore, insightful to the training on literary translation and also contributes to futures studies on training of translators, since it showed that despite their formal training, the Translation students need to practice more on literary texts to reduce the effort they need to devote to the task. As an undergraduate program only provides an overview of all (or most) types of translations, the translators who choose to trail the path of literary translation will need to look for supplementary ways of training and practice if they are to be successful in the translation/revision market.

The collected eye tracking data was used regardless of its quality, since the number of participants was small. The ideal would be that no one had worn glasses or contact lenses, since it interferes significantly in the collection. The collected data would have been more precise if all participants had met the request of non-ocular equipment.

A limitation in this study is that there was not a test for keyboard recognition. Since the participants were not used to the provided keyboard, this might have influenced eye-tracking data quality and the time it took them to produce the TT, for they had to look for the keys sometimes. It may have also led to typos in the translation, increasing the total number of deletions. Another limitation is the small number of participants, since there was no time for collecting and analysing more data. In addition, further Translog data could have been used and a more extensive analysis of the final product could have been done if there was more time.

Therefore, researchers interested in the processes of literary translations are welcome to continue this study, and the data are available for further analyses. The final products should also be further investigated, as the present study only focused on three linguistic features, rather than assessing their quality and correlating it to the process.

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APPENDIX 1 –. Informed consent

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Você está sendo convidado(a) para participar da pesquisa intitulada *Tapping into the process of literary text translation: an exploratory study*, sob a responsabilidade do pesquisador Prof. Dr. Igor Antônio Lourenço da Silva.

Nesta pesquisa, nós estamos buscando entender como tradutores que cursam um curso de graduação em Tradução e como professores de inglês que cursam outros cursos de graduação realizam tarefas de tradução envolvendo um texto literário escrito em inglês antigo.

O Termo de Consentimento Livre e Esclarecido será obtido pelos pesquisadores Prof. Dr. Igor Antônio Lourenço da Silva ou Ana Carolina Assunção Zampini imediatamente antes da primeira coleta de dado.

Na sua participação, você realizará uma tarefa de tradução para a língua inglesa, que será gravada utilizando *softwares* que registram tempos e todos os seus acionamentos de *mouse* e teclado, bem como movimentos oculares. Depois de da tarefa, você responderá a seis perguntas sobre a sua tradução e sobre o texto fornecido para tradução.

Em nenhum momento você será identificado. Os resultados da pesquisa serão publicados e ainda assim a sua identidade será preservada.

Você não terá nenhum gasto ou ganho financeiro por participar na pesquisa.

A sala da coordenação do curso de Tradução, 1G246, local de realização da tarefa, garante condições de trabalho seguras e tranquilas. Não se preveem riscos à sua integridade física, mas existe a possibilidade de desconforto físico e emocional com as condições de realização da tradução (por exemplo, teclado, *software* e sistemas operacionais diferentes daqueles utilizados por você), e, sobretudo, com a presença de um pesquisador com o qual você não tenha intimidade, afinidade ou empatia. Salienta-se, no entanto, que esta pesquisa será realizada somente se você se sentir em boas condições físicas e emocionais para realizar todas as atividades solicitadas. Existe ainda o risco, embora remoto, de identificação da sua pessoa, mas o pesquisador terá todo o cuidado em preservar o sigilo dos seus dados por meio da atribuição de códigos que são apenas do conhecimento dele. O Comitê de Ética em Pesquisas com Seres Humanos da Universidade Federal de Uberlândia (CEP/UFU) será informado de todos os fatos relevantes que alterarem o curso normal do estudo.

A pesquisa poderá trazer-lhe benefícios com relação ao fazer tradutório, dependendo do seu nível de reflexão sobre a sua prática tradutória e do seu interesse pelos resultados a serem divulgados. Além disso, as informações obtidas por meio deste estudo serão relevantes para a compreensão do processo tradutório e para subsidiar modelos e materiais didáticos para a formação de tradutores e para o aperfeiçoamento de tradutores que já estão no mercado.

Você é livre para deixar de participar da pesquisa a qualquer momento sem nenhum prejuízo ou coação.

Uma via original deste Termo de Consentimento Livre e Esclarecido ficará com você.

Qualquer dúvida a respeito da pesquisa, você poderá entrar em contato com o pesquisador responsável, Prof. Dr. Igor Antônio Lourenço da Silva, pelo *email* ials@ufu.br, pelo telefone (34)3239-4162 (ramal 626), pessoalmente ou por correspondência no seguinte endereço: Instituto de Letras e Linguística, Universidade Federal de Uberlândia, Av. João Naves de Ávila, 2121, CX 593, Bloco U, Sala 226, Campus Sta. Mônica, Uberlândia/MG - CEP 38408-100. Poderá também entrar em contato com o Comitê de Ética na Pesquisa com Seres-Humanos – Universidade Federal de Uberlândia: Av. João Naves de Ávila, nº 2121, bloco A, sala 224, Campus Santa Mônica – Uberlândia –MG, CEP: 38408-100; fone: 34-32394131.

Uberlândia, ... de ..... de 2017

_____

Assinatura do pesquisador

Eu aceito participar do projeto citado acima, voluntariamente, após ter sido devidamente esclarecido.

_____

Participante da pesquisa

APPENDIX 2 – Final product of each participant

T1 – A Translation student

Nienor, filha de Húrin, então nos encontramos novamente. Ao menos tivestes a alegria de enfim encontrar teu irmão. E agora, o conhecerás: um fura-olho na calada da noite, um traidor de seus oponentes, um descrente em seus companheiros, e uma desgraça para sua família. Este era Túrin, filho de Húrin! Mas o pior de seus feitos você sentirá, Nienor, na própria pele."

Glaurung morreu, e com sua morte Nienor desabou, abalada, sentindo-se envolta nas palavras do dragão como se fossem um véu feito de malícia. Sua memória voltou, então: dia após dia após dia surgiu diante de sua mente, porém não se esqueceu de tudo o que havia vivido desde que pisou em Haudh-en-Elleth. Horrorizada, sentiu todo o seu corpo tremendo em angústia enquanto Brandir, que ouvira tudo, inclinou-se em uma árvore, abalado.

T2 – A Translation student

'Hail, Nienor, filha de Húrin. Nos encontramos antes do fim. Eu te dou alegria que tu tens encontrado teu irmão finalmente. E agora no entanto tu deverás conhece-lô: um golpe no escuro, traiçoeiramente ao inimigo, infiel aos amigos, e uma maldição aos seus parentes, Túrin filho de Húrin! Mas o pior de todos seus atos tu deves sentir você mesmo.'

DEpois Nienor sentou como um atordoado, mas Glaurung morreu; e com sua morte o véu de sua malícia caiu dela, e todas as suas memórias cresceram claramente antes dela, dia após dia, nem ela esqueceu nenhuma dessas coisas que haviam caido sobre ela desde que ela se deitou no Haudh-en-Elleth. E todo o corpo dela estremeceu de horror e angústia. Mas Brandir que ouvia tudo, estava acometido, e se inclinou contra a árvore.

T3 – A Translation student

'Saudações, Nienor, filha de Húrin. Nos encontramos novamente antes do fim. Eu me alegro que tu tens encontrado vosso irmão afinal. E agora tu deves conhecê-lo: a um ser que apunhala na escuridão, um traidor dos inimigos, um amigo infiel e uma cina para os seus similares, Túrin, filho de Húrin! Porém o pior de tudo, suas ações tu deves sentir em tu própria.'

Então Nienor exausta como assombrada, não obstante Glaurung morreu; e com a morte dele o véu de sua malícia caiu sobre ela, e toda a memória de Nienor ficou clara diante dela, dia após dia, tampouco ela esqueceu alguma dessas coisas que se abateu sobre ela desde que ela chegou em Haudh-en-Elleth, e todo o seu corpo tremeu com o horror e a angústia. Brandir, que escutou tudo, aflingiu-se e encostou-se sob uma árvore.

E1 – An English instructor

Salve, Nienor, filha de Húrin. Nós nos encontramos de novo antes do fim. Eu fico feliz que você, finalmente, encontrou o seu irmão. E agora você deve conhecer ele: um traídor no escuro, traiçoeiro com os inimigos, desleal aos amigos, e uma maldição a sua raça, Túrin filho de Húrin! Mas o pior de todos os seus feitos você deverá sentir na própria pele.

Então Nienor sentou enquanto estava atordoado, mas Glaurung morreu e com sua morte o véu de sua malicia se foi, e assim toda a sua memoria ficou clara, dia após dia, ela também não esqueceu nenhuma daquelas coisas que caíram sobre ela desde que deitou sobre Haudh-en-Elleth. E toda o seu corpo tremeu de medo e angústia. Mas Brandir, que escutou tudo, estava aflito e escorou numa arvore.

E2 – An English instructor

- Saudações, Nienor, filha de Húrin. Novamente nos encontramos antes do fim. Fico feliz que tenha finalmente encontrado teu irmão. E agora você irá conhecê-lo: um traidor, traiçoeiro aos inimigos, desleal aos amigos e uma maldição em sua familia, Túrin, filho de Húrin. Mas o pior de seus feitos você ainda sentirá em si mesma.

Então Nienor sentou-se paralizada, mas Glaurung havia morrido; e com sua morte o véu de sua malicia caiu sobre ela; e toda sua memória clareou-se diante de si mesma, dia após dia, ela não havia esquecido nenhuma das coisas que a aconteceram desde sua chegada em Haudh-En-Ellet. E todo seu corpo tremeu de horror e angústia. Mas Brandir, que havia ouvido tudo, estava abatido, e apoiava-se contra a árvore.

E3 – An English instructor

Saudações, Nienor, filha de Húrin. Nos encontramos de novo antes do fim. Lhe parabenizo por ter encontrado seu irmão finalmente. E agora você deve conhecê-lo: um esfaqueador no escuro, traiçoeiro aos inimigos, sem fé aos amigos, e uma maldição aos seus familiares, Túrin filho de Húrin! Mas o pior de todos os seus feitos você sentirá em você mesmo.

Então Nienor se sentou atordoada, mas Glaurung morreu; e com sua morte o véu de sua maldade caiu sobre ela, e toda sua memória veio à tona claramente a ela, dia após dia, e ela também não havia se esquecido de todas aquelas coisas que tinham acontecido a ela desde que ela se deitou em Haudh-en-Elleth. E seu corpo inteiro tremeu em horror e angústia. Mas Brandir, que havia escutado tudo, estava atordoado, e se encostou em uma árvore.