

Tracking translation process: The impact of experience and training

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The translation process can be described through eye tracking. Rather than focusing on the translated text as the final product, this gives insight into what goes on in the mind of the individual during the translation process. This study compares the translation processes of a translation graduate who had no experience of translation, an experienced translator, and an individual with specific field knowledge. The participants were expected to differ in the process of dealing with the problematic points in particular and the whole text in general. Within the framework of this study, the disparities identified are questioned with respect to the translator training programs and professional experience. The results of the study reveal considerable variation in the translation processes and shed light on the possible factors leading to this variation.

Keywords: Eye-tracking, translation process, translator training, professional experience, field knowledge

Introduction

The translated text as product is the focus of most research in Translation Studies today. However, the process leading to the translated text has recently become a subject of interest as well. The aim of the present research is to provide insight to the process of the translation act, specifically with respect to possible differences between the translation processes of trained translators, experienced translators, and speakers of English as a foreign language with specific field knowledge. The main variable involved in this study thus compares the relative effects of translator training, experience, and field knowledge. These values were selected with reference to market needs, since they are assumed to be the three leading qualities required by translation companies when assigning a job to a “translator”. We assume that a degree in translation, professional experience and/or field knowledge are

the most frequently sought qualities, but we do not know how these different backgrounds affect the actual translation process.

This is a preliminary study to test whether eye-tracking is a useful methodology for carrying out a comparative study of this kind. An eye-tracker is a device used to observe the subject's eye-movements when in front of a computer screen. The camera on the screen records all the eye-movements, including the fixation durations, number of fixations, and pupil dilation. Eye-tracking is particularly used in psychological studies, webpage and software usability research, online marketing research, pre-testing of online advertisements, human-computer interaction research, and linguistic studies on human language development, language skills, and reading behavior. In language processing, eye movements are presumed to be closely linked to the current focus of attention, and thus provides valuable input. The subject's linguistic abilities are assessed by tracking and recording eye movements in response to predetermined verbal and visual stimuli.

The experiment was done with a Tobii T60 eye-tracker. Eye-tracking through Tobii T60 allows a considerable degree of head movement and minimizes distraction throughout testing. It was of utmost importance to ensure a translation environment that was similar to the subjects' natural environment, and the Tobii T60 eye-tracker ensured the most natural behavior possible. The tracking technology's high level of reliability is believed to yield more accurate and valid results.

Using eye-tracking provides us with observable and measurable data regarding the cognitive process during translation (Jensen & Pavlović, 2009:94). The assumption that eye-tracking is an efficient way of learning about the cognitive process is based particularly on previous research. Eye-tracking is also believed to reflect moment-to-moment cognitive processes in the various tasks examined (Rayner, 1998:372). Every moment of the translation process was examined. However, certain time periods that are expected to provide distinguishing feedback were analyzed in more detail. The information gained by means of eye-tracking is discussed with respect to the characteristics of eye movements, the perceptual span, integration of information across saccades, eye movement control and individual differences (Rayner, 1998:372).

Despite the advantages of working with an eye-tracker, it also bears shortcomings and difficulties. It is worth mentioning the high cost of the device and its lack of availability. The subject's unfamiliarity with the environment or computer is also likely to be a limitation. In order to overcome this, the subjects were selected among the ones who could use a desktop computer as comfortably as a laptop. In order to provide better fixations on the screen, the subjects were expected to look at the screen rather than the keyboard. Therefore, prior to the study all subjects were asked if they could type comfortably without looking at the screen. They did

not undergo any kind of pretesting, yet proved well on typing during the translation process.

Research Design and Methodology

The three subjects were asked to translate the same text. The eye-tracker used in this study was placed in a room free of noise or any other kind of distraction. During the translation process, there was only one person in the room in addition to the subject. This person had no specific knowledge of Translation Studies and was only responsible for giving technical support in case of any emergency. Each subject was taken to the testing room separately and did not witness the others' translation process. The subjects did the translations using the Microsoft Office Word. To follow the translation process of the translators with respect to the cognitive effort shown, their translation process was followed with an eye tracker.

The hypotheses tested in this study are as follows:

- Experienced translators and the translators with relevant field knowledge spend less time and show less cognitive effort completing the whole translation task than do trained translators.
- Experienced translators spend less cognitive effort translating complex sentences than do trained translators or the translators with relevant field knowledge.
- English speakers with specific field knowledge come up with more accurate translations for problematic terminology and with less cognitive effort than do experienced or trained translators.
- Repetition of the terminology in the same text requires all translators to invest less cognitive effort, regardless of individual profiles.

To test the hypotheses, the total duration of the translation, number of fixations and total fixation durations are analyzed for each subject and then compared.

Subjects

There are three subjects involved in the study. They were chosen deliberately to suit the research design. In the translation process, all three subjects were expected to deal with different kinds of source-text complexity.

The subjects have similar language competence. They all work as English Language teachers at the School of Foreign Languages at the same

university in Turkey. Subject 1 and Subject 2 have two-year teaching experience while Subject 3 has only one. They are 25, 24 and 23 years old, respectively. They are all female. They all studied English at university. They were instructed to translate from their second language to their native language. All three subjects performed the translation task at the same time of the day.

Apart from the similarities, the three subjects differ in their experience in translation, their education background and their field knowledge. Subject 1 has professional experience as a translator. She has been working as a freelance translator for three years and does approximately 10,000 words of translation work each month. She did not major in Translation and Interpretation and does not have specific field knowledge. Subject 2 does not have any professional experience as a translator; she is not trained in Translation and Interpretation, either. However, she has specific field knowledge, since she works in the Testing and Evaluation department at the university and is thus familiar with the topic of the source text. Besides, she studied English Language Teaching and took educational courses at university. Subject 3 does not work as a professional translator. However, she has a degree in Translation Studies. She graduated from a Department of Translation and Interpretation and is thus expected to be familiar with the certain translation techniques. She does not have any specific field knowledge.

This background information means that each of the three subjects fits into only one of the parameters mentioned above.

The Text

The subjects were asked to translate a text from English into Turkish. The text chosen comprises four sentences, with a total of 109 words. It has certain features of complexity. Since this study is preliminary in nature and has certain diagnostic aims, the text is relatively short and was chosen specifically to test the parameters under study.

The text is from the book *Language Testing in Practice* published by Oxford University Press in 2000:

Progress and Grading

In most instructional programs, both students and teachers are interested in receiving feedback on students' progress. Information from language tests can be useful for the purpose of formative evaluation, to help students guide their own subsequent learning, or for helping teachers modify their teaching methods and materials so as to make them more appropriate for their students' needs, interests and capabilities. Language tests can also provide useful information for summative evaluation of students' achievement or progress at the end of a course of study.

Summative evaluation is typically reported in the form of grades, and these are frequently arrived at on the basis of test scores. (Bachman and Palmer, 2000:98)

The text is about testing and evaluation, a topic that one of the subjects is especially familiar with. The performances of the subjects were assessed in terms of the translation of the whole text, the translation of complex sentences versus relatively less complex ones, and the translation of terminology. Of the four sentences in the text, one is significantly longer than the others and should thus test the subjects' performance in translating complex sentences. Three sentences in the text involve two terms specific to testing and evaluation: "formative evaluation" and "summative evaluation". One of these terms, "summative evaluation", is repeated in text and should thus test how the subjects deal with unfamiliar terminology the first and the second time they face the term.

Data Analysis

Within the context of this study, the cognitive efforts of the translators are determined by their fixation duration during the translation process. Fixation duration measures the duration of each individual fixation within an area of interest. The longer the fixation duration, the greater the cognitive effort is assumed to be. If the participant returns to the same specific element during the recording, the new fixations on that element are included in the calculations. The N value represents the number of fixations for the area of interest.

According to the first hypothesis, experienced translators tend to invest relatively less cognitive effort in completing the whole translation task than do trained translators and the translators with relevant field knowledge. This first hypothesis concerns the translation process of the whole text.

The figures indicate that Subject 3 completed the translation in 10 minutes 23 seconds (623 sec. in total) while Subject 1 completed it in 9 minutes 9 seconds (549 sec. in total), 74 seconds earlier, which means that Subject 1 was 13.5% faster. However, the fastest performance was by Subject 2: Subject 2 completed the whole translation in 8 minutes 37 seconds (517 sec. in total), 32 seconds earlier (6.2% faster) than Subject 1 and 106 seconds earlier (20.3% faster) than Subject 3.

A similar conclusion is also obtained for the total fixation durations (Table 1). The total fixation duration of the experienced translator is shorter than both the trained subject and the subject with field knowledge. The Subject with field knowledge did not have the least number of fixations. However, it is still less than the trained one. This is likely to indicate that Subject 2 invested less cognitive effort than the trained one. It is very likely

that unfamiliarity with the subject required the translators to make more cognitive effort regardless of their training.

Table 1: Number of Fixations and Fixation Duration of the subjects when translating the whole text

	<i>Number of Fixations</i>	<i>Total Fixation Duration</i>
Subject 1 (experience)	306	549 sec.
Subject 2 (field knowledge)	464	517 sec.
Subject 3 (training)	581	623 sec.

While the time spent on translating the whole text is likely to be accepted as an indicator of the cognitive effort made by the translator, the question triggered at that point is whether this whole time indicated in the screen recording is spent on translation activity. A closer look at the completion duration of the task reveals that the translation process of the individuals shows discrepancy as well. Each subject involved in the task started the translation activity at different times, which was indicated by the time they started typing. While there is no significant difference between the exact time Subject 1 and Subject 2 started typing, Subject 3 started significantly later. This delay is likely to be the result of prior reading of Subject 3. When asked during the post-translation interview, Subject 3 stated that as a trained translator she read the whole text before she translated it.

The data thus support the hypothesis, since it took less time for the translator with field knowledge to complete the translation task than the trained translator. Besides, considering the number of fixations, the experienced translator is assumed to show less cognitive effort in completing the task than the trained translator.

The second hypothesis posits that experienced translators tend to spend less cognitive effort translating complex sentences than do trained translators and translators with relevant field knowledge. Complexity here is represented by the length of the sentences and the field terminology they involve. This hypothesis is tested on the first and second sentences of the text.

Table 2: Number of fixations and fixation duration of the subjects on specific sentences

	<i>Sentence 1</i>		<i>Sentence 2</i>	
	<i>Number of Fixations</i>	<i>Total Fix Duration</i>	<i>Number of Fixations</i>	<i>Total Fix Duration</i>
Subject 1 (experience)	38	12.42	122	36.07
Subject 2 (field knowledge)	43	10.71	188	43.32
Subject 3 (training)	58	14.27	290	73.78

The figures given in Table 2 indicate the difference in the cognitive effort spent on the translation of the first and the second sentences. The total fixation duration on the second sentence is significantly greater than on the first one for all three subjects. Experience once again seems to decrease the cognitive effort made. Training, on its own, seems not to make the translation process easier. Field knowledge does contribute to the translation process, however, although not as much as experience. Familiarity with the topic is likely to help the translators comprehend the text better. That said, considering the fixation durations, at the production level it still seems problematic for the translator with relevant field knowledge to render complex sentences.

The third hypothesis posits that English speakers with specific field knowledge come up with more accurate correspondences for the problematic terminology, and do so with less cognitive effort than both trained and experienced translators. Although the main focus of this study is the translation process rather than the translation product, the accuracy of the terminology which the subjects come up with is worthy of consideration.

The commonly used equivalents for “formative evaluation” in Turkish are “biçimlendirici değerlendirme” (Demirel, 1993:130), while for “summative evaluation” we have “nihai değerlendirme” or “düzey belirleme değerlendirmesi” (Demirel, 1993:163). The translations are shown in Table 3.

Table 3: Translation of the terminology

Source-text term	1 st Subject (experience)	2 nd Subject (field knowledge)	3 rd Subject (training)
formative evaluation	biçimsel değerlendirme	resmi ölçümü	biçimlendirici değerlendirme
summative evaluation	summative değerlendirme	nihayi sonucu	OMISSION
summative evaluation	summative değerlendirme	nihayi sonucu	özet değerlendirme

Looking at the translations, it can be seen that the subjects all came up with different translations for the same term. This is highly possible since most of the time there is not just one correct term. However, in some cases the translations above do not make the same sense in Turkish. The subjects are expected to produce translations that are accepted by the field specialists. In the field of English Language Teaching in Turkey the common usage for “formative evaluation” is “biçimlendirici değerlendirme” and for “summative evaluation”, it is “nihai değerlendirme” or “düzey belirleme değerlendirmesi”. “Biçimsel değerlendirme” means something different (“biçimsel” in Turkish means “stylistics”). Thus, the experienced translator probably misunderstood the first term and gave an unacceptable translation. Subject 2’s “resmi ölçüm”, does not clearly mean the same thing. “Resmi

ölçüm” means “formal measurement” in English. The translation given by Subject 3 makes a similar sense in Turkish, though it is not the common equivalent. It indicates that the concept has been understood by the translator, but rather than a common equivalent, it was translated in different words. For the term “summative evaluation”, Subject 1 preferred a transliteration, Subject 2 gave a common equivalent (albeit with a spelling mistake -it should be “nihai” without “-y”), and the third subject’s translation is also acceptable in Turkish. However, it is worth mentioning that Subject 3 omitted the term in the first time it is given, but translated it when it is repeated.

Considering the main focus of the study, it is more significant to note the number of the fixations and the sum of the fixation durations when translating these terms. When the area of interest is determined as these terms, the figures show that for “formative evaluation” the translator with field knowledge invested the greatest amount of cognitive amount, while the experienced translator made the least effort (Table 4). For the term “summative evaluation”, it is again the translator with experience that made the least cognitive effort whereas this time the translator with field knowledge exerted the greatest cognitive effort (Table 5).

Table 4: Number of fixations and the sum of fixation duration for the term “formative evaluation”

	Number of Fixations	Total Fixation Duration
Subject 1 (experience)	4	1.23
Subject 2 (field knowledge)	10	2.95
Subject 3 (training)	10	1.98

Table 5: Number of fixations and sum of fixation durations for the term “summative evaluation”

	1 st occurrence		2 nd occurrence	
	Number of Fixations	Total Fixation Duration	Number of Fixations	Total Fixation Duration
Subject 1 (experience)	24	7.03	21	6.39
Subject 2 (field knowledge)	11	2.68	16	3.38
Subject 3 (training)	18	4.35	18	4.55

The fourth hypothesis posits that repetition of the terminology in the same text requires translators to invest less cognitive effort. The term “summative evaluation” is used twice in the text. The second time the translators confront this term, they are expected to invest less cognitive effort than the first time. However, the data in Table 5 indicate that the fixation durations for the first and the second occurrence is almost the same.

Translators exert the same or more cognitive effort in the translation of the same word even on its second appearance, so repetition of the terminology seems not to be a guarantee of less cognitive effort.

Conclusion

When the values of translation training, experience and field knowledge are considered, it seems that experience contributes to the whole translation process positively by decreasing the amount of cognitive effort. This hypothesis is supported with respect to the translation of complex sentences. Further, it can be concluded that complex sentences require the translators to invest more cognitive effort regardless of specific qualifications such as experience, training or familiarity with the topic. Contrary to expectations, while repetition of the terminology provides the translator with more accurate equivalents, it does not enhance the productivity of the whole translation process directly.

Since this is only a pilot study, it should be further developed by increasing the number of subjects, working with subjects with different qualifications, or triangulating with TAPs (Think aloud Protocols) or screen recordings to obtain more sound results, conducting interviews with the subjects or applying surveys after the translation process to gain a more detailed view of the translation process.

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