Second Language Students’ Revision During Translating Medical and Literary Texts: A Psycholinguistics Perspective

Перевірка другої мови студентів у процесі перекладу медичних і літературних текстів: психодінгвістичні перспективи

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Original manuscript received January 25, 2023
Revised manuscript accepted March 27, 2023

ABSTRACT

Introduction. Cognitive processes have been extensively examined in the literature of translation studies to identify what goes on in students’ minds when they translate from one language into another. Such investigations targeted translators’ pauses over
different texts from their native language into a foreign language. However, identifying translators’ revisions of different types of text remains sufficiently unexplored in the translation studies literature.

Goals. This paper attempts to examine Arab students’ translation behaviors (self-revision or self-correction in particular) during the translation of a text from their second language (English) into their first language (Arabic) and vice versa. It also aims to reveal how revising a translated text is moderated by the variety of directionality and text type. To this end, 27 Arab native students were asked to translate two types of texts: literary and medical texts from English into Arabic and from Arabic into English over a keystroke logging program (Inputlog). Their behaviors were video-recorded using a video screenshot program. After translation, four students were invited to take a stimulated recall interview by viewing their behaviors in the video and were requested to verbalize what they were thinking of when they deleted and/or inserted text during translation assignments.

Results. The results from the quantitative analysis showed that text type and L1–L2 directionality have significant effects on students’ cognitive processes. In addition, qualitative analyses obtained from MAXQDA revealed that students’ translators encountered difficulties in many areas such as creativity-demanding problems, lexical problems, comprehensibility problems, spelling problems (for only Arabic-English directionality), and syntactic problems.

Conclusion. Many cognitive process difficulties were identified which were related to psycholinguistics issues that need to be tackled in the translation studies.

Key words: cognitive processes, psycholinguistics, translation, Inputlog, revision.

Introduction

Tracking students’ mental activities during translating different text genres in different directionalities is crucial to understand their difficulties during the translation process (Rosa et al., 2018; Sofyan, 2016; Qian, 2017). Understanding students’ cognitive processes is the key to predicting the quality of the output translation (Swar & Mohsen, 2022). In previous years, translation was a laborious process that required the application of certain traditional methodologies like think-aloud protocol (TAP) to record retrospectively what goes in their mind during learning process tasks. TAP is a method in which a person or a group of people is asked to verbalize their thought processes as they do in the translation task or other tasks where their thoughts are to be recorded for further analysis (Jääskeläinen, 2010). This method has many limitations as it fully relies on students’ memory and thus the results could be biased...
due to subjectivity and lack of empiricism ((Mohsen & Qassem, 2020; Mohsen, 2021a). The digital age has, however, initiated a techno-culture that has changed the paradigms of translation in interesting ways that deserve to be thoroughly investigated. Much software has been proposed to help track the students' activities during translation or writing to record their pauses, mouse clicks, deletion, and insertion to form a fine-grained picture of the students' processes and to what extent their minds process difficulty in finding out equivalent words in the target language. Of this software are Translog (Jakobsen, 2006) and InputLog (developed by Leijten & Waes, 2013). Inputlog is a computer program that logs and records all keyboard activities or keystrokes of the translation process such as pauses, corrections, deletions, insertion, copy/cut and paste, and mouse operations (Carl Micheal, 2012). We opt to choose Inputlog to track students' revision as the log reports from Inputlog are comprehensive to cover all students' deletion, insertion, and R-burst (Mohsen, 2021b).

There are three translation process phases which include pre-drafting, drafting, and post-drafting (Mossop, 2001). We are interested in examining students' translators during the last two phases; as revision behaviors that are operationalized in this study be insertion, deletion, and/or R-burst, and they all are implemented during drafting and post-drafting. A revision is defined as the phase where the translator corrects himself/herself while translating a certain text while self-correction is making an addition, deletion, or making change to the target text (Malkiel, 2009). Furthermore, many studies (Barkaoui, 2016; Thorson, 2000) examined revision as whether learners were involved in the extensive operation at the levels of the form (spelling, punctuation, typos) or content (retrieving ideas, recalling appropriate words, or managing the flows of writing)” (Mohsen, 2021b: 4). Sofyan (2016), states that applying self-corrections includes deleting words, replacing words, checking the spelling, checking the meaning, checking the structure, and checking the capitalization. Therefore, revising the translation text may contribute to the quality of the translation produced by the translator.

Given the significance of investigating the translators’ revision in determining the underlying cognitive processes during the translation process on one hand and the dearth of studies on the other, we are interested in identifying what goes in translators’ minds during processing
different texts from a psycholinguistic perspective. Our purpose is to attempt to overcome translation problems to increase the students’ translators’ translation capacity. This study shall investigate the number of activities (insertion, deletion, R-burst) made by the participants while revising the task and the possibility that they might decrease after overcoming the performance weaknesses.

Significance of the Study
This proposed study seeks to disclose the importance of using translators’ activities in the educational field and how they should be used officially in translation learning classes. Therefore, this study attempts to reach findings that will add depth to the body of literature that exists on translation as a discipline. Significantly, it is important to state that investigating the effect of technology on the learning process by understanding how students deal with the tasks of translation is of great value. It is hence important to track the activities of the students and understand the various dynamics that inform their translation activities. The number of activities during revision such as insertion, deletion, and R-burst will be calculated and compared regarding directionalities and text genre. Data from interviews will enhance the quantitative results and indicate the significant role self-revision plays during the translation process.

The results will be feasible for trainers of translators to understand their difficulties and uncover their mental activities during the translation process. Translation behaviors will be revealed by log reports from Inputlog. Moreover, the log report and the findings of this study will help learners to diagnose the areas that they are suffering from and help them develop their translation capabilities. The research findings will also help understand areas of difficulty for Arab translators and this will open tips to be tackled by future studies.

Literature Review
Over the years a significant body of literature has emerged which has addressed the various issues that relate to translation study. Many studies focused on the tracking of pauses during the translation process (e.g., Qian, 2017; Rosa et al., 2018; Sofyan, 2016; Swar & Mohsen, 2022). It seems that there is a dearth of studies that examined the
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cognitive processes of translators’ revision during the translation of different texts from Arabic into English and vice versa. In translation, self-correction or self-revision is a mental activity that takes place during the translation process which may affect the quality of the final product greatly.

Revision is the process of correcting one’s translation or someone else’s translation (Robert, 2008). The self-revision term was employed by some researchers such as Mossop (2001) and Carl and Kay (2011). While the self-correction term was employed by others including Mizon and Dieguez (1996) and Malkiel (2009), self-revision is an important part of the translation process in which the translator revises his/her production (Mossop, 2001). It cannot be always done according to a certain order, they do not have to agree with the three phases of the translation process including pre-drafting, drafting, and post-drafting determined by Mossop (2001) and Jakobsen (2002). Furthermore, Kourouni (2012) distinguished between three methods of applying self-corrections. Firstly, linear, in which translators begin translating from the title and continue linearly until the end of the translation phase; second, inline, where translators go back horizontally and adjust their translation; thirdly, multidirectional, or non-linear, in which translators keep the title for the end, move directly to translate a few lines and then go back from the beginning or skip to another segment.

Self-revision or self-correction has a significant role in improving translated texts. However, Ibarrola (2009) argued that self-correction can be less effective according to the translator’s lack of knowledge of errors he/she has made in the first draft. This agrees with Malkiel’s (2009) arguments that self-correction is not about changing from incorrect to correct text, instead, it can be a subtle alteration. Indeed, the self-correction goal is to improve the quality of the text being translated, but sometimes translators change the correct translation to the incorrect one. This happens due to the lack of knowledge of writing and translation structure. Therefore, self-revision may be a great indicator of translators’ level in translating from one language into another, hence, the ability to improve the translation quality.

Sofyan (2016) applied an exploratory case study of the qualitative method including three master’s degree students majoring in translation studies. He investigated the process, type of self-corrections, and online resources that were mostly applied by the students during the
process of translation. His research aimed also at discovering how the translation process could affect the translation product quality. The participants were invited to translate two texts from English into Indonesian. The findings of his research suggest that the kind of process utilized the most by the participants was cognitive strategy and the kind of self-correction and word substitution was the dominant strategy done by the translators. The online resource used by the subjects was Google Translate and he concluded that three factors determined the quality of translation involving the best kind of translation process, implementation of self-corrections, and the perfect use of online resources during the translation process.

Likewise, Robert and Brunette (2016) investigated the verbalization of sub-processes and the quality of revision mistakes detection and duration. The study included 16 professional revisers and four source and target texts, with four different revision procedures. Results concluded that the more experience the revisers have in revision, the more they are capable of verbalizing. Another study by Antunović & Pavlović (2011) examined students’ translation processes from second and third languages (L2 and L3), focusing on self-revision. Two hypotheses were generated: (a) The distribution of students’ self-revisions, i.e. when they occur in the process, is primarily related to individual working habits rather than language pair; (b) the type and quantity of self-revisions are primarily determined by whether the students are working from their L2 or L3. In their study students translated comparable texts from their L2 (English) and L3 (Swedish) into their first language (Croatian). The results indicate that the distribution of revisions across phases might be correlated to individual subjects’ habitual behaviour. The findings do not support the expectation that the type and quantity of self-revisions are primarily determined by SL competence.

Tracking students’ cognitive processes represented by revision was the subject of many research studies in L2 writing literature. Xu (2018) tracked the Chinese students’ revision of L2 online text for high and less-skilled learners of writing. Results obtained from the Inputlog found that less skilled students revised more on a micro-level of writing and ignored the micro-level associated with writing content while the advanced skilled learners did the opposite. Mohsen (2021b) examined students’ cognitive processes by tracking the students’ writing behaviors through three stages; fluency, pauses, and revision. Using Inputlog,
students deleted more on L2 writing and less cognitive demand was found in processing L1 composition than that of L2 writing. However, the authors of the present study are not aware of a single translation study that examined the cognitive processes – from psycholinguistics perspective – translators encountered during translating different texts in two different directionalities: Arabic into English and English into Arabic. Therefore, this study attempts to address the following research questions:

RQ 1. How do students’ translators process different texts when they revised their product over a keystroke program?
RQ 2. How directionality and text genre variables can mediate the translators’ revision during the translation process?

**Methodology**

**Research Approach**

For this present study, a mixed-methods design was utilized. Inputlog 7.0 (Leijten & van Waes, 2013) was run to record the subjects’ revision activities when translating text from English into Arabic and vice versa. To triangulate the data, screen-recorded software (Active Presenter) and a video-stimulated recall interview (VSRI) were used in the qualitative section to fully identify underlying cognitive processes produced by the subjects while translating. This study examined the revision processes including (deletion, insertion, and R-burst) as tracked by Inputlog, and students’ verbal responses about their cognitive processes were captured by the VSRI to determine what these students were thinking about when processing text translation with different directionalities. SPSS was used to quantitatively analyze these revisions, whereas verbal responses to the questions were analyzed qualitatively using MAXQDA.

**Participants**

The participants of this study were 27 students’ translators who were native speakers of Arabic. All the participants were Saudi female undergraduate EFL university students. These students were in their seventh year of study at the College of Languages and Translation at Najran University, majoring in translation studies. They hold the same demographic data profile, including their age, proficiency in the L2,
nationality, culture, and educational system, and had a mean age of 22 years (standard deviation = 1.47). These students had studied EFL for six years in their school before enrolling the college and were well-versed in various translation techniques and text types. They had no prior experience as competent translators.

**Instruments**

Using Inputlog software, information about students’ keystrokes was recorded (‘logged’), which contained keystroke logging and mouse-tracking activities, which were appropriate for analyzing data that answered the research questions (Daems et al., 2017), and these keystrokes can be replayed to track the students’ actions and activities. Their translation process was video recorded using Active Presenter software to track their activities and a VSRI was conducted to triangulate the data collection tools where I asked the participants about the different reasons behind revising their translation.

**Text**

An English medical text and an Arabic literary text were given to the students’ translators to do the assignments. The selection of both texts was based on the same selection criteria mentioned (Swar & Mohsen, 2022). The ET was chosen using several criteria. First, the text must be scientific that has been appeared in a peer-reviewed scholarly journal or on the website of any health organization within the last five years. Second, the text must not be longer than 120 words. Third, the material should be written in simple language, with only a few terms that require additional processing and are difficult to understand even with a dictionary. Fourth, the text should be written in prose to assess the participants’ ability to construct sentences and paragraphs in logical order in Arabic due to the differences in sentence organization between these two languages, in Arabic without making lexical errors (Alduais, 2012; Schwarz, Stiegelbauer, & Husar, 2016). Finally, the text should focus on an international health phenomenon that is widely common because such an issue tends to hold terminologies that tend to be familiar to students, avoiding terminological issues (Schwarz, Stiegelbauer, & Husar, 2016). The selected material for the Arabic text (AT) should deal with Arabic culture to easily identify the various cultural and terminological problems associated with the translation (ibid.).
Procedures
The subjects were invited to the study via the Learning Management System (i.e., Blackboard) by their lecturers. Participants who used Microsoft Windows were requested to join a WhatsApp group launched by the first author. Instructions on how to run the experiment were videotaped and distributed to the subjects. They were instructed how to install Inputloh and screen video capture (Active Presenter) on their laptop computers and instructions were given on how to run the software prior to doing the main task. Once they completed their jobs as instructed, they were cordially requested to submit the translation outputs to the first author's email. The programs were pre-tested to ensure that they ran smoothly on the subjects' side. These subjects were told to run Active Presenter prior to Inputlog, and they were requested to provide demographic information such as their names. Following that, they were instructed to click on the button “record” once they started, a few moments later, a Microsoft Word file was generated where grammatical and spelling detectors functions were disabled. The subjects were instructed to place the Arabic medical text and started translating it into English. After the break of 15 minutes, the subjects were asked to begin the second assignment, which required them to translate an English literary text into Arabic. Following these two sessions. Finally, they were thanked and asked to send the files to the first author’s e-mail.

Results

Quantitative Analysis
As mentioned in the study approach above, the data collected from Inputlog will be analyzed quantitatively and the data collected from stimulated recall interviews will be analyzed qualitatively using MAXQDA software. Visualization of themes will be provided by the software.

Q1. 1. How do students’ translators process different texts when they revised their product over a keystroke program?

Descriptive statistics and inferential statistics are summarized in Table 1 for all the total numbers of the three indicators of revision; deletion, insertion, and R-burst.
Table 1
Descriptive and Inferential Statistics for Students’ Revision of the Texts

<table>
<thead>
<tr>
<th>Revision</th>
<th>Medical text</th>
<th>Literary text</th>
<th>paired-sample t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>deletion</td>
<td>41.33</td>
<td>30.71</td>
<td>27.04</td>
</tr>
<tr>
<td>insertion</td>
<td>20.07</td>
<td>11.00</td>
<td>8.12</td>
</tr>
<tr>
<td>R-burst</td>
<td>34.59</td>
<td>21.55</td>
<td>24.59</td>
</tr>
</tbody>
</table>

Results from Table 1 show that students’ translators deleted more words and phrases in their translation of medical text than the literary text and the difference is statistically significant. \( t(26) = 2.85, p < .05, d = .55 \). Likewise, their R-burst is significantly higher in the medical text translation than in the literary text \( t(26) = 2.69, p < .05, d = .52 \). However, the insertion indicator was not statistically significant for both types of text despite the means scores in the medical text were higher than the means scores of insertions in the literary text.

**Qualitative Analysis**

In the qualitative analysis of the interview responses, the approach of (Swar & Mohsen, 2022) was adopted, MAXQDA was utilized to generate reports for the Arabic and English translations, and nodes were built based on similar themes and the number of coded segments. Themes include lexical problems, syntactic problems, creativity-demanding problems, comprehensibility problems, and spelling problems. These categories are also adopted by Swar and Mohsen (2022). Stimulated recall interview data from four undergraduate students majoring in translation were used to triangulate the data. Four themes in AT and five in ET emerged after reviewing the interviews, comparing the responses of each participant with other participants, and coding all the responses. Each theme with the results of the interview data analysis is presented in the following subsection in AT and ET. Quotes from the responses of the participants were used to identify and illustrate the themes (Jeannite, 2018).

**Arabic Translation**

**Theme 1: Creativity-demanding problems**

Guilford (1950) used a factorial approach to provide nine dimensions that are a prerequisite for creativity, including fluency.
According to Göpferich (2009), fluency is the capacity of producing a great number of translation variants. Participants during the interview expressed their struggle with how to formulate sentences from English into Arabic. One of the participants, for example, stated, “I revised my work here because I was thinking about my translation and wondering if it was appropriate for the current situation. After that, I modified it and typed a sentence, I still didn’t think it was acceptable, so I rewrote it again”.

**Theme 2: Lexical problems**

The lexical problem faced by students, specifically in finding equivalent words in Arabic, emerged as one of the main themes. “In the whole process of translation, equivalence is the key concept for any language” (Akan et al., 2019). One of the participants was asked why she revised her translation at the beginning of translating the English text (ET), she replied, “I had a problem with the phrase” a skiff, “I couldn’t figure out how to translate it and I reread the text over and over only to try to understand it”.

Another participant revised her output because she could not discover the Arabic equivalent of the same phrase. She also had trouble identifying a synonym for the word ‘Gulfstream’. The last term was a challenge for all contestants. Another one confirmed that she had a problem with the equivalent of “an old man” in Arabic because she was wondering whether the equivalent terms she had in mind are either in Modern Standard Arabic (MSA) or in colloquial Arabic.

**Theme 3: Syntactic problems**

Arabic and English belong to different language families; hence, the difference can cause problems when translating both languages (i.e., English and Arabic). The syntactic difference between Arabic and English needs translators to pay attention to (Akan et al., 2015). In other words, because Arabic and English are from distinct language families, translators may have difficulties when translating Arabic or English texts. “When translating English to Arabic, how can I alter the order of the words so that the output of AT sounds correct?” asks one of the participants. She expressed how it is obvious that a literal translation is never an option.

**Theme 4: Comprehensibility problems**

The comprehensibility problems for a translator can be caused by the degree of the translatability of specific terms in the SL
One participant expressed difficulty in comprehending and interpreting the concepts “gulfstream” and “salad” in Arabic. In (Figure 3) and as seen by the word cloud, these phrases were frequently stated by all participants during the interviews. The participants’ comprehensibility issues were mostly connected to the difficulty in obtaining the right lexis that represents the TL meaning, which explains why they revised texts many times.

As shown in (Figure 1), the student translators had similar problems, (Creativity demanding problems, lexical problems, comprehensibility problems, and syntactic problems). On the other hand, no sign of struggling with spelling problems which can be predicted since they were translating into Arabic (their first language).

**Figure 1**
*Arabic Translation Coding by Node*

**Theme 1: Creativity-demanding problems**
Likewise, in English-Arabic translation directionality, formulating sentences in Arabic-English translation directionality was one of the difficulties the participants encountered. One student translator reported “I had a problem in formulating some of the sentences and I had to revise some of them many times”.

**Theme 2: Lexical problems**
When asked about the reason for revising her English translation, one student translator stated that she had the most trouble identifying analogous terminology, just as most participants did while translating from English into Arabic. Two other participants had difficulty in...
translating the verb “(expose) into English. Meanwhile, others struggled to translate the word” (absorption). In addition, two students shared their reasons behind some of the revisions they made: “I did not know how to translate the term “may decrease” in such a way that it would be appropriate to the context”. “Also, I did not know the translation of the term “sunscreen” and its equivalent in English”. Their views ensure that lexical issues in their Arabic translation were one of many difficult challenges they faced during the translation.

Theme 3: Syntactic problems

Arabic and English as mentioned belong to different language families. Arabic has two structures (a) verbal and (b) nominal, but English usually has only a nominal sentence structure (Akan et al., 2015). All participants confirmed that they had problems with word order when translating from Arabic into English. One student stated, “here I revised my translation because this sentence was too difficult for me to arrange in English”. Another student reported, “I always had difficulty when I translated into English with word order”.

Their responses to the interview question confirmed that word order was a great challenge they faced while translating.

Theme 4: Comprehensibility problems

Given that the SL was Arabic (the participants’ first language), they did not seem to have many problems understanding the text. Yet, two of the participants were confused with some of the terms such as (skin pigmentation) and (absorption) for some reason. One of the students shared, “I had to reread this phrase many times just because I faced a problem regarding the actual meaning of the term “skin pigmentation”. Another stated, “here, I wanted to fully understand the term, “absorption” and make sure I got the meaning right.

Theme 5: Spelling problem

As shown in (Figure 2), this theme only emerged in students’ translation of the second language, English. However, it has not been traced in the students’ translation of their mother tongue Arabic.e. EFL students, even after many years of studying English, are often incapable of mastering spelling and pronouncing monosyllabically simple words (Al-Busiadi et al., 2015). Hence, participants revised their work many times to polish spelling issues. One participant argued that she faced a lot of spelling problems and she was not sure whether the terms being translated were correct. For instance, the term, “sunscreen” and
“daily amount”. Another student stated that she revised the spelling of monosyllabic words such as, “multivitamin”, “season” and “regularly”, just to name a few.

**Figure 2**
*English Translation Coding by Node*

**Figure 3**
*Arabic and English Translation Word Cloud*

MAXQDA word clouds were generated to visualize the frequent use of words of all participants while translating Arabic and English texts. In other words, word clouds were used to show patterns of interview responses and generated themes. Words like, ‘deletion’, and
‘insertion’ were repeated many times since the main question asked during the interviews was about the reasons behind them. The major mental activity investigated during the interviews, (revision) was present with the frequent use of the phrase, “I revised...”. The participants faced many problems while translating such as finding synonyms, reformulating sentences, and understanding some of the terms as shown in the word cloud, (Figure 3).

Discussion

This study intends to track the students “translators” revision behavior using different text genres with different directionalities to see how their cognitive processes differ in terms of deletion, insertion, and R-burst. Their recorded behaviors as indicated by a keystroke logging program showed that students' translators deleted more words and phrases in their translation of medical text than in their translation of the literary text, and the difference is statistically significant. Even though the mean scores of insertions in the medical text were higher than the mean scores of insertions in the literary text, the insertion indicator was not statistically significant for either kind of text. The quantitative findings suggest that the students' translators revise more in translating in text in L2 than L1 as suggested by deletions and R-burst. They opted to pay much attention to the accuracy of their L2 text as they master their first language text and thus ensure text automaticity. These findings do align with the previous studies' findings in L1 and L2 writing contexts (De Larios et al., 2002; Mohsen, 2021b). Despite translation assignments being different from translation tasks since the translators’ job is to transfer the exact meaning of a text from a source language to a target language while in writing writers are asked to reflect on their ideas and arguments about a specific topic, students reported difficulty in translating from their mother tongue to a foreign language. Another possible reason is the difference in text genre which has yielded different outcomes. Students might find that difficulty in processing medical terminologies as the majority of these terms are borrowed from Latin and students might not be much involved in medical texts as they did in literary texts.

The qualitative findings from a stimulated recall interview reveal that the participants encountered difficulties with creativity-demanding
problems, spelling problems, lexical problems, and syntactic problems in English translation text. In the case of AT, the participants reported the same problems in addition to comprehensibility problems which were higher than they faced in the case of English translation text. However, they reported that they did not face any problems regarding Arabic translation text as Arabic does not have irregularities in the spelling system and it has a phoneme-graphic system (Saigh & Schmitt, 2012). The participants expressed difficulty in recalling terminologies, the English word order system, automaticity in finding equivalent words in the TL, text comprehensibility, and formulating statements from an SL to a TL. All these problems created high cognitive processes which interpret the flow of translation and thus affect the quality of the produced final output. The students' translators who took part in this study were inexperienced in translation as they were still in their first experience translating different texts. Therefore, it is expected to experience a high cognitive load in processing the text and to focus more on low-cognitive ability rather than a content form (Mohsen, 2021a; Sofyan, 2016). A possible reason for such cognitive load is their lack of automaticity in translation, so they need to master Arabic and English competencies to be able to process translation properly.

**Conclusion**

In conclusion, this proposal has provided the background for the proposed study. It has revealed the significance of Inputlog as a tool for translation. Activities taking place during the translation process are difficult for researchers to control. Therefore, using software in translation process research is necessary. Different cognitive processes undergone by learners during the translation process can be uncovered using a keystroke logging program. Importantly students' translators have experienced many difficulties which augmented their cognitive processes during the translation of Arabic and English texts. Different genres and different directionalities of texts play an integral role in increasing cognitive processes which negatively affect the translation outcomes. As the current study investigates the underlying cognitive processes of the students' translators to reveal syntactic, semantics, lexical, and comprehensibility problems, lack of automaticity and
poor experience in dealing with translation were the main reasons for cognitive processes increment.

Limitations and suggestions for future research
There are some limits to this work. For starters, collecting the data was limited to Inputlog and other technology tools such should be used to track students’ activities during the process of translation. The experiment included just 27 participants, which was insufficient. In addition, this study was limited to female EFL university students in Saudi Arabia in their seventh year of study concentrating on Translation. Furthermore, only two types of texts (medical and literary materials) were employed in the translation work to encourage participants to participate. Finally, the two texts were too concise and longer texts are recommended in future studies.

Given these limitations, future studies should consider using other devices for collecting the data such as eye-tracking programs. Moreover, researchers should consider recruiting a bigger sample to have more reliable findings. Different genres should be explored to see whether there are any changes in the behavior of translators between genres. Furthermore, different types of texts should be investigated as well to ensure that the results can be generated on all genres of texts or not. Ultimately, the two texts were overly brief, and lengthier texts are recommended for future research.

Acknowledgment
This study was funded by the Literature, Publishing and Translation Commission, Ministry of Culture, Kingdom of Saudi Arabia under [128//2022] as part of the Arabic Observatory of Translation.

ADHERENCE TO ETHICAL STANDARDS

Ethics Declarations. The study was conducted according to the guidelines of the Declaration of Helsinki (1964). The study was approved by the ethical committee board at Najran University. All the participants were asked for written consent/permission to take part in the study. Participants were made aware of their right to withdraw from the study at any time.

Data Availability Statement. Data cannot be shared for ethical/privacy reasons.
**Funding.** Translation Studies and Research Grants Program at the Literature, Publishing, and Translation Commission at the Ministry of Culture in the Kingdom of Saudi Arabia.

**Conflict of Interest.** The authors declare no conflict of interest.

**Author Contribution.** Ahood Swar: Preparation of tables, figures, diagrams, Methodology, Writing-original draft preparation, Writing-review and editing. Mohammed Ali Mohsen: Formal analysis and investigation, Writing original draft preparation, Supervision, Writing-review and editing.

**Consent for Publication.** The authors approve of this submission and, conditional upon the decision made by the editorial board from the peer-review process, consent to the publication of the current work. The work has not been submitted to other journals in consideration for publication.

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Перевірка другої мови студентів у процесі перекладу медичних текстів: експериментальний проект

АНОТАЦІЯ

Вступ. У перекладознавчій літературі широко досліджувалися когнітивні процеси, щоб визначити, що відбувається у свідомості студентів, коли вони перекладають з однієї мови на іншу. Такі дослідження були спрямовані на вивчення пауз перекладачів під час перекладу різних текстів з рідної мови на іноземну. Однак дослідження перекладацьких редагувань різних типів текстів залишається недостатньо вивченим у перекладознавчій літературі.

Мета. Ця стаття є спробою дослідити перекладацьку поведінку арабських студентів (зокрема, саморедагування та самокорекцію) під час перекладу тексту з їхньої другої мови (англійської) на першу (арабську) і навпаки. Воно також має на меті з’ясувати, як перегляд перекладеного тексту модерується різною спрямованістю та типом тексту. Для цього 27 студентів-арабів попросили перекласти два типи текстів: літературні та медичні тексти з англійської на арабську та з арабської на англійську за допомогою програми...
реєстрації натискання клавіш (Inputlog). Їхню поведінку записували на відео за допомогою програми для створення скріншотів. Після перекладу чотирьом студентам було запропоновано взяти участь в інтерв'ю зі стимулюванням спогадів, переглянувши їхню поведінку на відео, і ім було запропоновано вербально пояснити, про що вони думали, коли видаляли та/або вставляли текст під час виконання перекладацьких завдань.

Результати. Результати кількісного аналізу показали, що тип тексту і спрямованість L1–L2 мають значний вплив на когнітивні процеси студентів. Крім того, якісний аналіз, отриманий за допомогою MAXQDA, показав, що студенти-перекладачі мали труднощі в багатьох сферах, таких як проблеми, які потребують творчого підходу, лексичні проблеми, проблеми з розумінням, орфографічні проблеми (лише для арабсько-англійської спрямованості) та синтаксичні проблеми.

Висновки. Було виявлено багато труднощів когнітивних процесів, які пов’язані з питаннями психолінгвістики, що потребують вирішення у перекладознавстві.

Ключові слова: когнітивні процеси, психолінгвістика, переклад, Inputlog, редагування.