Translation and Cognitive Sciences: Understanding the Influence of Selective Attention

التّرجمة والعلوم المعرفيّة: دراسة في تأثير الانتباه الانتقائيّ في عمليّة التّرجمة

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Abstract:

The aim of this paper is to study the influence of attention on translation. The study will provide a detailed analysis of the correlation between specific types of errors and distorted selective attention. With reference to the definition of attention, this paper explains first how a translator completes a dedicated task while managing his attention resources. Second, an empirical study has been conducted to explore the negative influence of distorted attention in making errors and, thus, in decreasing the quality of the translated output. Results showed that selective attention influences the translation process in case of a distorted work environment, thus pushing the translator, unintendedly, to make errors. The paper concludes by affirming that training the translator to cope with his work environment and to better distribute his attention can limit errors while translating.

Keywords: Errors, Translation Process, Cognitive Sciences, Attention, Work Environment

ملخص:

تهدف هذه المقالة إلى دراسة تأثير عنصر الانتباه في إتمام عمليّة التّرجمة. يتوسّع هذا البحث في دراسة تحليليّة للعلاقة القائمة بين عددٍ من الأخطاء وتشتّت الانتباه الانتقائيّ. فبالاعتماد على تحديد عنصر الانتباه، تعمد هذه المقالة أوّلًا على تصوّر كيفيّة عمل المترجم وتوزيعه للانتباه خلال عمليّة التّرجمة. أمّا ثانيًا، فتعرض هذه المقالة في جزئها الثّاني دراسة ميدانيّة هدفت إلى الغوص في تأثير تشتّت عنصر الانتباه الانتقائيّ في عمليّة التّرجمة وبالتّالي في ارتكاب المترجم الأخطاء. وقد أظهرت نتائج هذه الدّراسة أنّ عنصر الانتباه مكوّن أساسيّ لنجاح عمليّة التّرجمة وأنّ تشتّتها نتيجة أي تأثير خارجيّ ناتج عن ظروف العمل قد تدفع بالمترجم إلى ارتكاب الأخطاء. وخلصت هذه المقالة إلى ضرورة تدريب المترجم على كيفيّة توزيع انتباهه عند وجود عامل مشتّت وذلك بغية تقليص عدد الأخطاء وإنجاح عمليّة التّرجمة.

كلمات مفتاحية: الأخطاء، عمليّة التّرجمة، العلوم المعرفيّة، الانتباه، ظروف العمل.

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1. Introduction

Research in translation studies has been going on for a long time; however, understanding translation, as a cognitive process and the factors that may drive translators to commit errors, has recently intrigued researchers. Theorists and researchers in translation studies have long argued that errors are linked to the linguistic skills of the translator (Gile, 2005, p.37; Papavassiliou, 2007, p.30) and to his ability to find correct equivalences. A translated text's most common errors may include linguistic and translation errors. First, linguistic errors are supposedly linked to the translator's linguistic skills and may cover ambiguity, barbarism, spelling errors, unnecessary repetition, and grammar errors. Second, translation errors may cover incorrect meanings, omissions, nonsense, calque, and hypertranslation, to name a few. The source of such errors is still considered an area of much research in translation studies.

For this reason, translation process studies have evolved over the years, and consequently, research has been affected by the recent interest in studying translation in light of cognitive sciences. This shift of perspective had a tremendous impact on how translation as an active process is perceived and discussed. Researchers have been proving that translation is not a mere linguistic transfer but a complex mental operation that surpasses language and pushes the translator to refer to specific cognitive factors. While studies have been intensively examining the concept of a successful translation, it remains far more interesting to devote the same efforts to determining the source of errors to prevent such a predictable outcome (Séguinot, 1989, p.73). In this regard, new research methods, described in this paper, have considered addressing the sources of errors to produce a successful translation.

Despite the progress in explaining translation in light of cognitive sciences and the influence of cognitive factors[1], some areas of concern still raise specific questions regarding the real sources of errors. Are errors always associated with the inability of a translator to use his world knowledge and linguistic skills? Can the influence of certain cognitive factors cause those linguistic and translation errors? And, if so, what types of errors are caused by the negative influence of such cognitive factors? While some argue that linguistic errors result from an unintended deviation from commonly known language rules, researchers proved that linguistic and translation errors share the same source. De Saussure (2003) assumes that all mental and cognitive processes are performed in particular areas of the human brain where information is processed. Some theories, such as the relevance theory, indicate that the language system is part of the central nervous system (De Saussure, 2003, p.156; Joanette & Lecours, 1984, p.27). Where the brain is concerned, it is the nervous system's function to activate the language system and to give the translator an open door to his linguistic skills. Such an

[1] Such as the interpretive theory of translation, which proposed a three-phase translation process. The most critical phase of this theory is phase two, "the deverbalization phase", where the translator's brain is fully immersed in the mental process to avoid transcoding. (Lederer, 1994, p.113).

introduction describes and presents the problematic, the methodology and the claims of the research an assumption suggests that its source is purely cognitive regardless of the error's type. Therefore, understanding how cognitive factors influence the course of translation is a step toward preventing the translator from committing specific errors.

In light of cognitive sciences, this paper reports the results of an empirical study that addresses the types of errors caused by a specific cognitive factor. The study focused on selective attention, considered the central factor of the translator's thinking and decision-making process (Chanquoy *et al.,* 2007, p.33). The study analyzed the correlation between attention as a cognitive factor and the number and types of errors made by participating translators. This paper is divided into two main sections. In the first section, the theoretical framework defines attention as a cognitive factor, especially its selective form, its relation to other cognitive factors, and its impact on translation. The second section covers the design, research methodology, and results of the two-phase experiment.

2-Theoretical Framework

Cognitive sciences have always been involved in studying the functions of the human brain (Tatilon, 2007, p.164), among which is the translation process. As undoubtedly one of the most complicated cognitive processes, many translation researchers and theorists have already identified a strong link between translation as a process and certain cognitive factors (Lederer, 1994, p.113). Therefore, translation is thought to involve the activation of the entire central nervous system when understanding the source text and conveying its message in a well-structured target text. Throughout the years, studies have demonstrated that meaning is a significant component of the translation process. In keeping up with such a claim, meaning contributes to the three phases of translation, mainly the deverbalization phase (Balliu, 2007, p.4). To understand and decipher the meaning, researchers indicate that the translator tends to involve his world knowledge, situational knowledge, and linguistic and extralinguistic skills (Balliu, 2007, p.4; Lederer, 1994, p.23). The same studies further indicate that the deverbalization phase is thought to be closely associated with cognitive factors, including attention, perception, and memory. Lederer (1994) indicates that "deverbalization is a cognitive process because knowledge of the perceived information is stripped out of their original forms."

Many research in translation studies have tried to demonstrate the "causes" of errors and how to enhance translation as a process. For example, Lee-Jahnke (1998) pointed out that translation failures are often associated with bad deverbalization. According to Lee-Jahnke (1998), such an outcome may be linked to psychological and cognitive factors and the work environment in which the translator is present:

> Les facteurs psychologiques – traits de personnalité, habitudes spécifiques, etc. –, mais aussi les facteurs sociaux, peuvent avoir une incidence sur la transmission des messages, en l'occurrence des traductions. On peut donc considérer que, chez la personne qui traduit, les facteurs psychologiques et sociaux influent sur les messages qu'elle produit (ses traductions), et que, si ces facteurs affectent un grand nombre de traducteurs sur une période plus ou moins longue, ils peuvent contribuer à modifier la langue elle-même. (Lee-Jahnke 1998, p.168)
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> [Psychological factors – such as personality traits, specific habits, etc.-, and social factors can also have an impact on the transmission of messages, and consequently on the translation process. We can, therefore, consider that psychological and social factors influence the messages (translations) that the translator reproduces. Furthermore, if such factors influence a large number of translators over a long period of time, they can modify the language itself. (Lee-Jahnke 1998, p.168).]

It appears evident at this point that the contribution of cognitive and psychological factors in the course of translation has direct and indirect effects on its outcome. Recent studies in psychology investigated how psychological factors can impact cognitive ones. These studies ascertained that mental health could sometimes negatively influence the cognitive factors of an individual, thus leading to cognitive decline and the inability to think correctly and make the right decisions (Boyle, 2012, p.1). Such an assumption implies that mental health problems, such as depression, stress, psychological distress, and the impacts of the work environment can influence a translator's ability to translate. With this in mind, psychological factors and work environment stress can influence the cognitive factors on which the translator relies to finalize his work. Therefore, these conditions can alter the translator's ability to process the perceived information, grasp the meaning, and re-express the source message. Despite the importance of all the factors cited above, this paper only covers certain forms of attention and their influence on the course of the translation process.

2.1.Attention

As with any other mental process, the influence of attention on translation is inevitable. However, the focus of this study is to determine the extent to which such influence can lead the translator to commit specific types of errors. According to cognitive science, mental processes include a series of intertwined activities, which,

through treating information, result in the total cognitive activity of the individual (Prat, 2005, p.7). Attention is one of those activities.

Although attention has been widely studied, researchers still need to define its different processes and forms. Nevertheless, many researchers in cognitive science agree that attention can be considered a selective form of perception (Bertrand & Garnier, 2005, p.100). Such definition implies that attention mainly involves processing and treating relevant information perceived from the outer world (Eysenck, 2001, p.113). Treated information is either used instantly or stocked in the memory for future use. For this reason, attention is closely related to other cognitive factors and processes, such as visual perception, short-term and long-term memory, and decision-making.

While the influence of attention on any mental and cognitive process is commonly known, few studies have investigated such influence on the course of translation itself. Explaining attentional processes or mechanisms has been associated with cognitive psychology, philosophy, and cognitive neurophysiology. Bertrand & Garnier (2005) explain that attention is a cognitive factor that, associated with language and perception, can lead to information processing, decision-making, and selection activities:

> Dans le comportement humain, l'attention a pour fonction de ne pas laisser l'individu, répondre passivement aux sollications de l'environnement : elle se traduit par des bénéfices, dans les tâches entreprises par les individus, entrainant souvent, plus de rapidité ou plus de précision au cours de leur réalisation….L'attention constitue l'un des principaux facteurs de contrôle du fonctionnement cérébral et comportemental. Elle contribue simultanément à la perception, à la sélection et au traitement des informations qui parviennent à l'individu. (Bertrand & Garnier 2005, p.99)
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> [In human behavior, attention does not let the individual passively respond to environmental soliciations: it is translated into benefits and tasks undertaken by individuals, often resulting in more speed or more precision during their realization….Attention is one of the main factors controlling cerebral and behavioral functioning. It contributes simultaneously to the perception, selection and processing of information that reaches the individual. (Bertrand & Garnier 2005, p.99)]

Attentional processes are pivotal to the entire mental, intellectual, and cognitive process and the fulfillment of the translator's work. Taking into account the cognitive aspect of translation, attention, through its different forms, helps the translator select, treat, and analyze relevant information perceived from the source text (Eysenck, 2011, p.113). For this reason, the following sections cover the work and influence of two

main forms of attention: selective attention and distributed attention (Chanquoy *et al.*, 2007, p.72).

2.1.1. Selective Attention

Selection is the most vital form of attention as it interferes during the translation process, especially during the deverbalization phase. Concerning its selective aspect, this form of attention is responsible for helping the individual focus only on relevant information and ignore irrelevant ones (Maquestiaux, 2017, p. 46). For instance, when an individual perceives a multitude of information, the role of selective attention is to choose the most appropriate option and to dismiss the irrelevant ones (Gopher, 1994, p.27). This hypothesis can, undoubtedly, be applied to the translation process. When a translator reads the source text, information perceived from the source text is swiftly conducted to the brain for treatment. Promptly alerted, selective attention must analyze the perceived information and point out the appropriate meaning of its components. This process ensures the coordination between perceived information and information stocked in the translator's memory. Hence, it is presumed that distorting this flow may damage the translation process and push the translator to commit translation and/or linguistic errors. Distortion, at this level, may impact the translator's ability to focalize his attention and, thus, his entire information processing mechanism. Neurosciences have affirmed such coordination, as attention is connected to other cognitive systems. The human nervous system is not only composed of the brain but of a series of specialized systems, processes, and mechanisms that enable the transmission of nervous impulses and the processing of incoming and stocked information (Papavassiliou, 2007, p.32). As a ramified cognitive factor, attention connects, when necessary, to visual perception for information input (Hampson & Morris, 1995, p.11) and memory – both short-term and long-term – for retrieving stocked information.

While the output of selective attention is paramount to the quality of translation, researchers still argue about the timing of selective attention. For instance, Eysenck (2001) suggested the concept of early selection when the individual is simultaneously exposed to the stimuli. On the other hand, Gopher (1994) proposed the concept of late selection, when a multitude of information is being processed and where the individual can choose the correct options and dismiss the inappropriate ones. On this subject, empirical studies on the negative influence of selective attention raised the question of inattentional blindness (Chabris & Simons, 2010, p.1059). Results of these studies indicate that when the attentional process is distorted, visual perception may deceive the individual inducing him into misreading and thus decreasing his ability to concentrate.

Intricate and delicate, as it may be, the concept of selective attention has also been metaphorically discussed by Broadbent (1958) in light of the filter theory. In his theory, Broadbent (1958) hypothesized that individuals tend to focus on one task when

subject to simultaneous tasks. Thus, two main components, selection, the attentional filter, and the temporary buffer, can control attention (Eysenck, 2001, p.115). In line with this hypothesis, recent studies further assume that the role of this attentional filter is not to prevent irrelevant information from being processed, as previously concluded, but to point out those who should not take part in the processing mechanisms (Maquestiaux, 2017, p.47).

No matter the time of intervention of this cognitive factor and regardless of its ramifications, attention can sometimes be distorted. It takes excellent skills, competencies, and experience to control it. Many studies in neurosciences admit that the plasticity of attention enables it to address potential distortions and deficits (Hopfinger, 2017, p.70). Researchers have promoted the ability of individuals – here, the translator – to train their attention to cope with their surrounding environment:

> The potential plasticity of attention mechanisms holds promise for addressing a wide array of disorders and deficits. Furthermore, as a core cognitive mechanism acting between early bottom-up and later high-order processes, attention may be an ideal target for research into how modifiable cognitive mechanisms remain throughout the lifespan. (Hopfinger, 2017, p.70)

2.1.2. Distributed Attention

Many theories in cognitive science have been working on unifying the definition of attention. Nevertheless, all of them agree that this form of attention implies the distribution of attention when treating different stimuli (Maquestiaux, 2017, p.23). Distributed attention is broadly one form of the attentional process activated when an individual is exposed to more than two stimuli. This form raises several questions, primarily when devoting attention to a specific task or more than one task. Allport *et al.* (1972) consider that distributed attention can take two forms, automatic and controlled. Following this reasoning, a complex task – that can also be dual – is possible only when the individual's mental capacities are not overwhelmed. Bearing this in mind, an individual can shift his attention to finalize a complex task, provided that one of the tasks follows the automatic processing of attention (Chanquoy *et al.*, 2007, *p.18*). Undeniably, the involvement of both processing mechanisms can be altered in many cases, especially when external factors such as the work environment and noise pollution – to name a few – and internal factors, such as psychological disorders, stress, and depression, are involved. Nevertheless, many studies have indicated that experience can help the individual control those mechanisms (Gopher, 1994, p.27) and cope with any distortion to the whole attentional process.

2-2.Translation and Attention

The translation process is the most complicated mental process. Research in cognitive sciences and cognitive psychology has been trying to understand how individuals and translators perceive and understand the source text before re-expressing its message. Concerning the above, research in cognitive neurophysiology has not been able to properly divide the translation process and, thus, to understand what happens in the brain of a translator while he is working (Papavassiliou, 2007, p.33). In order to produce a target text, the translator relies on diverse cognitive factors such as visual perception, attention, short-term and long-term memory, and reasoning. When perceiving information from the outer world – reading the source text, for example – the translator stimulates several processors of attention. He will either treat information and stock it in his memory for future use or associate the recently treated ones with his world knowledge, situational knowledge, linguistic and extralinguistic skills, and cognitive context (Ghaly, 2018, p.144).

When tasked with a translation, the translator, usually, refers to his selective and distributed attention forms. He tries, as much as possible, to limit any chance of being distracted and disturbed. Given the translator's control over his cognitive factors, in terms of refocusing and building experience, external factors, such as the work environment, may still influence his attention and push him into committing errors. How would the translator's attention be negatively influenced by the work environment? What exact types of errors are committed? Could the translator recenter his concentration and attention on this task?

Although humans are sometimes overwhelmed with emotions, the translator is always eager to curb any disturbance when working. Admittedly, the translator will always work on providing the most suitable conditions for concentration. Throughout the three phases of translation adopted by the interpretative theory, attention is thought to be distributed between them. It also becomes apparent that more attentional processes are required to finalize a translation. The translator must combine the automatic processes with the controlled ones, which are strictly associated with the level of alertness of his attention. The three phases of translation may follow the automatic processes of attention. Nevertheless, new information, perceived from the source text, may also require the translator's recourse to controlled attentional processes. In fact, controlled attention is on high alert during the whole translation process. This hypothesis implies that the form of attention differs from one phase to another and within each phase (Ghaly, 2018, p.154). After all, it seems appropriate to assume that attention is distributed within the same phase of the translation process and rapidly selective between the three phases altogether. This going back and forth is known as alternating attention.

Translation as a process is challenging as it involves reading, understanding, and re-expressing. In fact, during the reading phase of translation, visual perception

reflects the translator's responsibility to decode the linguistic cover of a word (Saussure, 2003, p.117) and prepares his attentional process to grasp the meaning of the text and re-expresses it by following the grammatical rules of the target language. However, the translator, sometimes, relies on his automatic attentional processes during deverbalization.

There have been many pioneering studies in translation on the different forms of attention, mainly the alternating one. While the results of thinking-aloud protocols have been tremendous in understanding the flow of the translation process (Lee-Jahnke, 1998, p.157), studies conducted in recent years have followed a different path to understanding the translation process. Interestingly, these studies applied the eye-tracking technique (Chang, 2011, p.154) and keystroke logging (Jensen, 2011, p.221) to monitor the alternation of vision between the source text and the target text. However, these studies delved into explaining attention through visual perception, another cognitive factor associated with attention. Regardless of the approach chosen to explain translation through the influence of cognitive factors, it is important to conduct, along with the theoretical framework, an empirical study with translators working in real-time to better understand their workflow and their use of cognitive factors. For this reason, this study continues with an empirical study to specifically indicate the types of errors committed by a translator when selective attention is disturbed.

3. Research Design and Method

This empirical study was part of a doctoral dissertation focused on examining cognitive factors' influence on translation. This study aimed to specifically indicate and determine the number and types of errors committed by a translator when his selective attention is distorted. Accordingly, it was divided into two main parts to collect quantitative and qualitative data. In the first part, third-year students were invited to participate in a two-phase experiment, where they were tasked with translating four literary texts. The students were categorized into a control and experimental group, where only the latter was subject to changes in the work environment during the second phase of the experiment. In the second part, participants of the experimental group were invited to a 45-minute focus group to discuss their experience. This study adopted the mixed approach to collect and triangulate data and, thus, followed two parts. Its quantitative approach served as a tool to collect data on the number and types of errors committed in the target texts. In contrast, the qualitative approach served as a tool to triangulate the statistics and collect additional data through the focus group.

3.1.Participants

It is worth mentioning that the participants were informed of the research design and were asked to sign a consent form at the start of the experiment. The results of 34 participating students were gathered and analyzed for this study. The participants were all third-year students enrolled in the Bachelor of Translation program at the Saint Joseph University of Beirut. Various inclusion parameters were considered, including the participants' academic background, attendance of translation strategies courses from French into Arabic, age, and fluency in both languages. For this study, all participants were expected not to suffer from any diagnosed mental health problems.
The participants were randomly divided into a control group (17 participants) and an experimental group (17 participants). The study adopted random division to ensure representativeness and inclusion (Mellinger & Hanson, 2017, p.10). Grades of those students were taken, their names coded and, then, inserted together in statistical software, "SPSS," to prove the absence of significant differences. Results did not show statistical significance, which means that the differences between both groups are irrelevant as the grade average was broadly similar (Table 1).

Table 1
Group Division into Control and Experimental Groups

	Number	**Average**	**Average in percentage**	**Standard Deviation**
Group 1	17	11.85	59.26%	1.95
Group 2	17	11.65	58.27%	1.81

3.2.Experimental Tests

Throughout the experimental tests, the participants of both groups were asked to translate four literary texts from French into Arabic. The experimental test consisted of two phases, which lasted for two non-consecutive weeks. During the first phase, all participants were seated in suitable conditions that would not distort their selective attention or influence the course of the translation process. Accordingly, such conditions would allow them to translate freely without being stressed, overwhelmed, or pressured. They were given an hour and a half to finish the translation. Next, participants of both groups were asked to translate the same two literary texts (Text 1 and Text 2) into Arabic. Texts were translated on two consecutive days, and both groups had one hour and a half to produce an acceptable well-structured translation. However, the work conditions changed during the second phase of this experimental test. Both groups were asked to translate the same texts (Text 3 and Text 4) into Arabic, yet the experimental group participants translated them in altered, stressful, and pressurizing conditions. Participants of the said group were tasked with translating

while listening to four-superposed Hard Rock music. Participants of the control group translated under conditions similar to the first phase. The purpose of this intended difference in environmental conditions was to test first whether noise pollution can distract selective attention and push participants to make errors and second to determine the types of errors induced by such distraction.

Throughout both phases, participants were asked to produce a text they deemed void of linguistic or translation errors. In addition, they were not allowed to use online translation aids but could use offline ones, such as their personal glossaries and monolingual and bilingual dictionaries. Choosing such criteria to conduct the translation process would give the participants the necessary time to resort to their world knowledge, situational knowledge, and cognitive factors, such as attention in all its forms.

Further to the above-elaborated experiment and based on the analysis of resulting quantitative data, only participants of the experimental group were invited to a discussion. The latter aimed at allowing them to talk about their experience: 1- when translating in a disturbing environment, 2- the mechanisms used to cope with such an environment and the solutions, 3- overcoming translation difficulties resulting from such an environment, and 4- the types of errors that they think they committed. To this end, the 45-minute discussion was divided into two major sections. The first section consisted of three questions concentrated on the disturbing environment itself and the difficulties borne by the translators. Answers to these questions contributed to a better understanding of the negative influence of selective attention on translators' concentration and, thus, on the number and types of errors. The second section, which also consisted of three questions, treated the translation and linguistic errors made by the translators and their individual ways of overcoming such hassle. Questions targeted the types of errors the translators thought they made and their suggestions and solutions to overcome such disturbing conditions.

3.3.Texts

The two-phase experiment relied on four texts chosen carefully by a professional overseeing the entire study. The selected texts were written in French, pertaining to the same field (literary), and authored by different novelists. The selection of the texts was established using different criteria such as:

a. Text form and structure which may englobe implicit message;
b. The importance of the implicit message;
c. The level of complexity of the implicit message and;
d. The occurrence of several expressions, terms, and idioms specific to the French language

Given the similarities of the four texts, it was decided to randomly give them to the participants throughout the two phases of the experiment. The first chosen text (Text 1) was extracted from *L'Etranger* by Albert Camus, while the second one (Text 2) was extracted from *Le Jardin de Badalpour* by Kénizé Mourad, the third one (Text 3) from *Métaphysique des Tubes* by Amélie Nothomb and the fourth and last one (Text 4) was from *La Vénus d'Ile* by Prosper Mérimée. All texts were relatively short and shared the same length of texts given during exam sessions at the university (Text 1: 250 words, Text 2: 230 words, Text 3: 205 words, and Text 4: 235 words). The length of the texts was paramount to this study as longer texts would be time-consuming to the participants and would restrain them from finishing the translation in the dedicated time. Furthermore, the translation of longer texts would have created more complexity in the translation process and would have shifted their attention to other variables which were not tackled in this study.

3.4.Translation Assessment

Translation assessment is, undoubtedly, one method of measuring the translator's performance and the quality of the translated text (Saridaki, 2021, p. 102). Therefore, this method has been adopted to collect quantitative data from the experimental test. For this purpose, a specific evaluation grid was drafted based on the assessment criteria adopted by the Saint Joseph University of Beirut and the United Nations. The grid was divided into three main sections (linguistic errors, translation errors, and general coherence of the text) and sub-sections. The purpose of each section was to measure a particular aspect of the translation while the role of each sub-section was to indicate the type and frequency of a specific error. For instance, the section covering translation errors was subdivided into the different types of translation errors, thus, the ability to determine the exact error and the number of its occurrence in the translated text. The last section covering the general coherence of the text served as a tool to assess the overall quality of the translation. The diversity of sections enabled to detect, through the number of errors, whether the changes have influenced the translator's performance in his work environment.

An external expert has assessed the translation of the participants of both groups. Each translated text was assessed according to the evaluation grid mentioned above. The grading of the translations took into account the number of errors and the general coherence of the text. Upon this assessment, the overall grades and the number of occurrences and types of errors have been collected to be quantitatively assessed.

3.5. Data Collection and Analysis

3.5.1. Quantitative Data

Following the mixed approach adopted in this study, quantitative data was first collected, uploaded to the statistical software SPSS, and statistically analyzed. At this point, two statistical tests were conducted. First, the paired T-test was conducted to

study the impact of work conditions on the control group and the experimental group throughout both phases of the experiment. This test is a statistical method used to measure if the same group shows differences when, at least, one variable changes throughout the phases of a specific experiment. The results of this test are to demonstrate any statistical significance[2] at the level of the average of committed errors between each group. Any significant difference, especially in the case of the experimental group, may indicate the negative influence of distorted conditions on the outcome of the translation. Second, the independent T-test was conducted to study the differences between both groups in each phase of the experiment. This second statistical test is a method used to measure the presence of a significant difference between two groups, where one is subject to a variable at a determined time. In order to further investigate the dissimilarities between both groups in each phase of this experiment, the independent T-test focused on studying the differences at the level of the average grade attributed to each group respectively in Phase 1 and Phase 2 and the average of errors committed by the participants of each group respectively in Phase 1 and Phase 2. Both tests have been considered crucial when analyzing the data.

3.5.2. Qualitative Data

Following the research methodology, the qualitative approach was adopted to complete and support the quantitative approach (Creswell, 2008, p.214). For such an end, participants of the experimental group were invited to participate in a 45-minute focus group to better discuss their translation experience during Phase 2. The whole discussion was recorded and transcribed. The six questions asked during the discussion were drafted based on the quantitative results. Frequent ideas, words, and expressions mentioned by the participants were assigned codes and uploaded to a specialized qualitative research software, Atlas.ti, to simplify the analysis of the focus group's data. The software provided different tools to determine the repetition of specific codes and, subsequently, ideas and expressions. Results were visualized in several types of diagrams. The analysis of the qualitative data contributed to further support the results of the quantitative data.

3.6. Results

3.6.1. Quantitative Results

Quantitative results showed differences between the control and the experimental group on three levels: the number of linguistic errors, the number of translation errors, and the overall grade. First of all, during Phase 1 of the experimental test, participants of the control group committed 13 linguistic errors, and 7 translation errors and

[2] "Statistical Significance helps quantify whether a result is likely due to a chance or to some factors of interest" (Redman, 2016)

received an average grade of 10.97 over 20. Nevertheless, during Phase 2, the same participants committed 11 linguistic errors, and 6 translation errors and received an average grade of 11.27 over 20. Throughout the experiment, an improvement of 2.74% was noticed in the overall grade level in the control group. Since the participants were not subject to a different variable in the second phase of the experiment, only the level of difficulty of the text may have resulted in a slight improvement in their performance. Participants may have developed and enhanced their linguistic and extralinguistic skills in this specific type of text.

Second, during Phase 1 of the experimental test, participants of the experimental group committed 7 linguistic errors, and 7 translation errors and received an average grade of 12.20 over 20. During Phase 2, a remarkable difference was noticed in the average number of committed linguistic and translation errors and the overall grade. Participants have, on average, committed 10 linguistic errors and 11 translation mistakes and received 10.40 over 20 as an average overall grade. This increase in the number of errors indicates a deterioration of performance when the participants were subject to a variable. Nonetheless, a decrease of 14.75% has been noticed at the level of translation quality of the experimental group. Results suggest a correlation between the overall decline in the performance of participants of the experimental group, the increased number of errors, and the negative influence of distorted selective attention.

A closer look at the results of different statistical tests demonstrated the error rate, their specific types, and the related statistical significance. Results indicate that the experimental group made more linguistic and translation errors during the second phase with a statistical significance of 0.018 than the first phase. This significant increase in the number of errors was the influence of distorted selective attention. Meanwhile, the control group showed a decreased linguistic and translation error rate of 17.26% and 5.71%, respectively. This increase in translation quality observed at the control group level suggests that experience is built throughout the professional life of a translator.

TABLE 2

Types of Errors Made by Both Groups and Their Statistical Significance

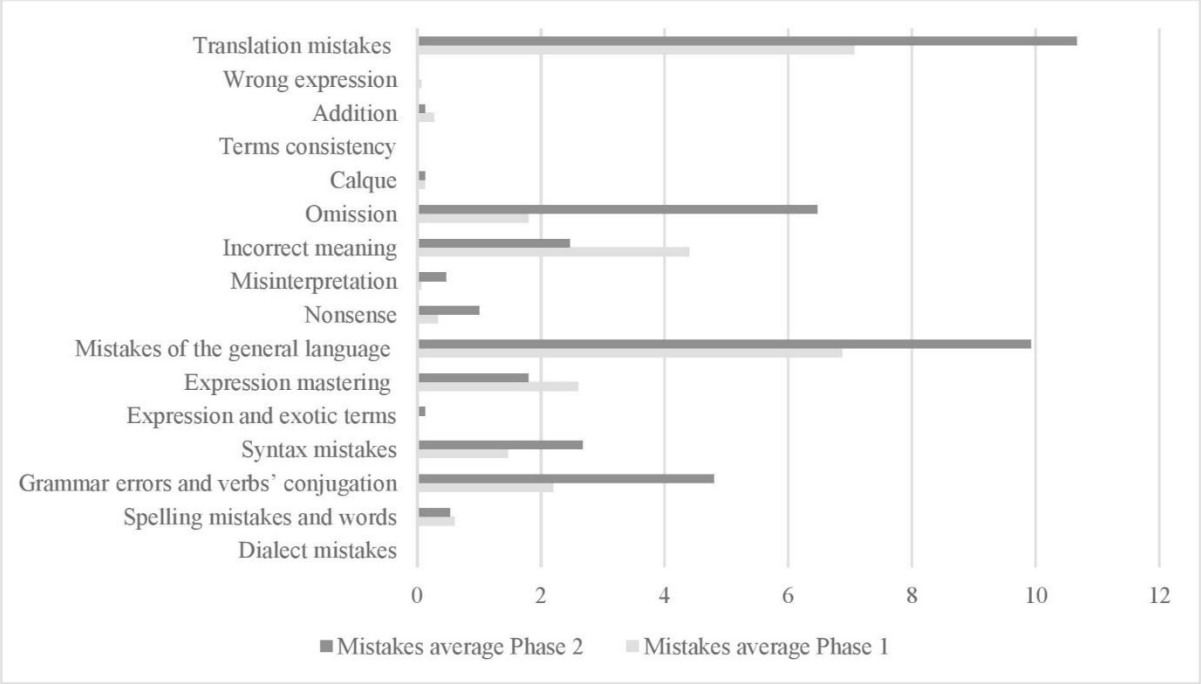
Group	**Type of Error**	**Phase**	**Error Average**	**Standard Deviation**	**Percentage of Change**	**Statistical Significance**
Experimental Group	Linguistic	Phase 1	6.87	3.64	44.66%	**0.018**
		Phase 2	9.93	4.96		
	Translation	Phase 1	7.07	2.43	50.43%	0.124
		Phase 2	10.67	8.68		
Control Group	Linguistic	Phase 1	13.13	4.41	-17.26%	0.061
		Phase 2	10.87	4.78		

	Translation	Phase 1	7.00	3.95	-5.71%	0.796
		Phase 2	6.00	5.00		

As the study pushed further to indicate the types of errors committed by the participants of the experimental group, results indicate that those participants committed specifically grammar and conjugation errors (3%), syntax errors (27%), errors of the general language (12%), in addition to incorrect meaning (24%), nonsense (3%), and omissions (31%). A more detailed evaluation shows that the distortion of selective attention has pushed the experimental group participants to commit more translation errors than linguistic ones.

Figure 1

Errors Committed by the Participants of the Experimental Group



3.6.2. Qualitative Results

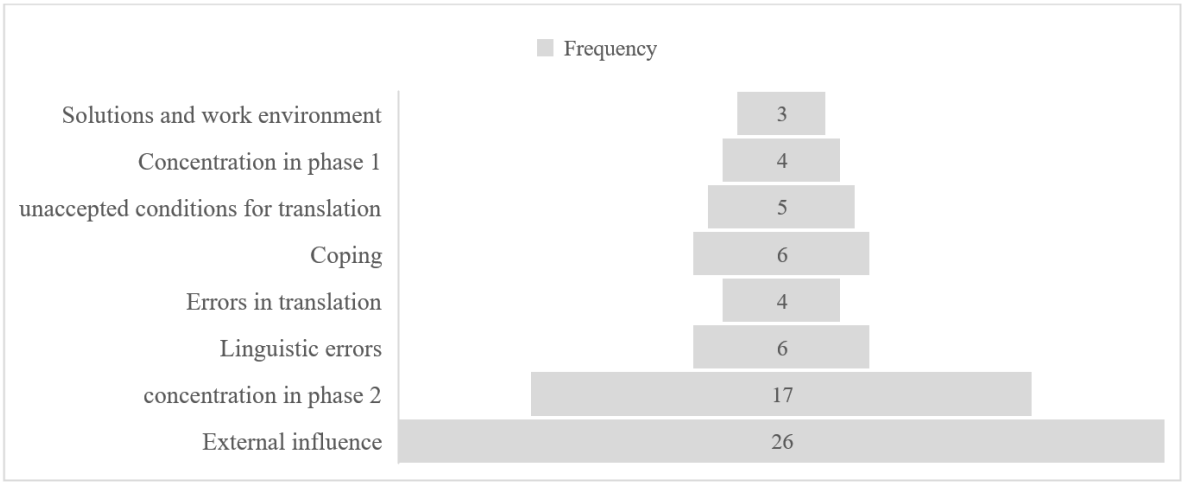
The focus group results clarified that participants talked about a particular "negative influence" when translating during the second phase of this experiment(Figure 2). The cognitive influence is considered the participants' main concern when covering specified forms of attention, selective attention, concentration, and even extensive reading and visual perception. Being unable to concentrate and correctly read the source text are ideas that have been broadly discussed among participants. Expressions such as "I could not concentrate," "my attention has been distorted," and "I could not understand the source text" were reported during the said focus group. Several participants also described their experience of being incapable of correctly reading and understanding terms and expressions, which were already part of

their world knowledge. Some participants even confessed that they misread words they already knew and mistranslated them. For instance, they read “pot a feu” as if it were “pot a fleur,” and they were misled in their translation. The participants clarified that some words that were part of the common knowledge needed more concentration than usual; meanwhile, others shared that they intendedly omitted some words to avoid concentrating again.

Nonetheless, it is noteworthy that the experimental group participants confessed that they were aware when making the previously detected linguistic and translation errors. Participants also shared that the inability to concentrate on evident words and expressions has impeded them from concluding simple translation tasks. While participants admitted to making errors, they were relatively aware of their specific types. With reference to the verbatim (Figure 2), the quantitative results already justified the committed errors, such as sentence structure, incorrect meaning, and omission. Moreover, the qualitative data also affirmed that besides mentioning the cognitive influence, participants acknowledged the presence of a psychological influence, including stress, pressure, and feelings of anger. Participants argued that the necessity to find inhibiting solutions to distorted attention is crucial to minimize the number of errors in the translated text. They added that when disturbed by the music they were hearing, they tried diligently to find appropriate ways to stop its negative effect.

Figure 2

Most Discussed Ideas During the Focus Group



4.Discussion

The translation is a complex process that involves linguistic and extralinguistic skills and requires the full engagement of specific cognitive and ergonomic factors (Dow, 2020, p. 333; Ghaly, 2018, p.273). The full concentration of the translator is linked to those factors; thus, any distortion could lead to unwanted repercussions.

Nevertheless, the results of this study cannot be generalized as the number of participants was small. However, this study aimed to discuss how the distortion of selective attention may lead the translator to commit certain types of errors, consequently decreasing the quality of his translation. While the confirmation of the hypothesis has been evident to some, findings have revealed more than what was expected.

First, the study demonstrated that cognitive and ergonomic factors negatively influence a translator's work. When the working conditions of the experimental group changed in the second phase of the experiment, selective attention was not alert. Translation as an active process requires the ability of the translator to keep his attention alert to stop any external factor that may interfere with the quality of the translation. The quantitative and qualitative results have, indeed, proved this correlation. The quantitative results demonstrated that the changes in the working conditions have led to the distortion of attention and have pushed the translators to commit specific errors (Figure 2). The discussion with the experimental group participants also indicated that the loss of concentration pushed them to commit errors. Participants were forcing themselves to impede those distractions and to focus on finishing the translation. Those results are consistent with the Theory of Constructive Operators (Howard et al., 2014, p.2). The theory suggests two types of inhibition of mental attention: automatic and effortful inhibition (Howard et al., 2014, p.2), which can help any individual, specifically the translator, in fulfilling a particular task. While the participants were trying, rigorously and purposefully, to inhibit the distraction of their attention, they committed more errors as they disturbed the workflow of other types of attention.

Second, the distortion of attention has, unfortunately, prevented the correct distribution of attention and has, negatively, influenced the automatic processes of translating simple and common-knowledge expressions. Qualitative results demonstrated (Figure 2) that when the participants were trying to concentrate on the task, they needed help understanding the meaning of commonly known terms. Consequently, the participants mistranslated them and committed frequent incorrect meaning errors (Figure 1), such as their translation of "pot a fleur" and "pot a feu." Misreading and misunderstanding simple words and expressions disrupted the translation's first phase, which is reading the source text. Such an act can also be interpreted in light of the inattentional blindness theory of Chabris & Simons (2010). When selective attention was distorted, the visual perception of those participants deceived them and led them to misread some commonly-known words. Such a claim indicates that the implication of different types of attention was also distorted during the translation process. A bad perception led to a bad deverbalization. The inability to make decisions and select the correct meaning has also created a feeling of stress and unworthiness. Beck (1967) defined this feelings of "cognitive distortion" as a psychological state of inaccurate thinking, perturbed perception, and the inability to treat, select and interpret information (Rnic et al., 2016, p.349). Furthermore, many

participants trying to avoid such concentration have committed many omissions (Figure 1). The qualitative data confirmed such errors as participants indicated that omitting was more manageable than focusing on specific words.

Third, despite the inability of the participants to impede the distracting conditions, results have shown another positive aspect of attention, plasticity. This aspect is the ability of an individual – the translator in this study – to adapt to changing conditions (Berthier *et al.*, 2018, p.110; Hopfinger, 2017, p.70). Such assumption was broadly visible at the level of the grade averages of the experimental group as the statistical significance was equal to 0.099. Although it was expected to indicate a more catastrophic translation quality, the number of errors, detected in Phase 2, validated the hypothesis of coping with the environment. It is suggested that this adaptation is linked to the similarity of the texts in terms of the chosen field or even to the inhibitory processes activated by the translator. Further research is necessary for validation.

Finally, adaptation is not new to the work of a translator as the latter, with experience, can produce a quality translation despite the surrounding entourage. Moreover, if well-trained, a translator can benefit from adaptation to shift attention from the source of distraction to the translation process itself.

5.Conclusion

It remains difficult in this prolonged study to have a single conclusion. However, the sole aim of this paper was to examine the correlation between distorted selective attention and the types of errors committed by the translator when his work environment changes. There is a traditional belief that understanding the real sources of errors is a significant step toward achieving high-quality translation. Despite the small number of participants and their nature – novice translators and not experts –it has been concurred that attention, as a cognitive factor, is influenced by the work environment. The lack of expertise of participants in coping with undesirable conditions did not stop this study from establishing the complexity of translation as an active and cognitive process. Whereas the results of this study cannot be generalized, they further illustrate the different types of errors committed when attention is distorted. Through this study, linguistic and translation errors appeared not to be linked explicitly to the lack of world knowledge, situational knowledge, or linguistic skills. Data showed that the translator's performance is, indeed, influenced by several factors, among which is selective attention. The study paves the way for future research, where attention is the focal point to attain quality and other cognitive factors that can entail perception, short-term memory, long-term memory, and reasoning.

Finally, this study is part of the recent empirical research addressing the link between cognitive sciences and translation studies. The nature of such studies is reiterating the translator's place, being the center of attention, by studying the translation process as an active cognitive task. Despite the results' importance, more

experimental techniques remain a must when Arabic is the target language. It remains crucial to find appropriate techniques to study the complexity of the translation process in light of the habits of experienced translators in Arabic. Indeed, research in foreign languages, mainly English, German and French, explored the techniques of distributed attention (Jensen, 2011, p.232) and eye-tracking (Sjørup, 2011, p.197) when studying translation quality. However, Arabic remains one of the few languages that require more time when applying those techniques. Research, in this regard, remains widely open.

NOTES

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