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## **Stress in Written and Sight Translation in Training Setting El Estrés en la Traducción Escrita y Visual en el Entorno de Entrenamiento**

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**Abstract:** Translation is a problem-solving activity, where the translator is in charge of problems arising not only from the translating material, but also from the emotional factors, the most significant of which stress. Stress can have both facilitative and debilitating impacts on the human performance, therefore, it is of paramount importance to indicate how much, if at all, the work of translator involves stress. To investigate stress in translation, a sample of translation students were asked to complete a written and a sight translation task from English to Persian. The changes in their blood pressure and heart rates were measured before and during the translation tasks. The findings revealed that sight translation is significantly more stressful than written translation and can result in a meaningful rise in blood pressure and heart rate. A significant increase in heart rate was observed during the written translation. Comparing the significant changes in systolic blood pressure of the male participants and heart rate of the female participants during the written translation, with no significant difference between the blood pressure and heart rate of both male and female participants throughout the sight translation, showed the difference in the stress response between the genders disappears during excessive stress.

**Keywords:** Stress; Blood pressure; Heart rate; Gender; Written Translation; Sight Translation

**Resumen:** El estrés puede tener impactos facilitadores o debilitantes en el rendimiento humano, incluida la traducción. Para investigar el estrés en la traducción, se pidió a una muestra de estudiantes de traducción que completaran una tarea de traducción escrita y visual de inglés a persa. Los cambios en la presión arterial y el ritmo cardíaco se midieron antes y durante

las tareas de traducción. Los hallazgos revelaron que la traducción visual es significativamente más estresante que la traducción escrita y puede resultar en un aumento significativo de la presión arterial y el ritmo cardíaco. Se observó un aumento significativo en el ritmo cardíaco durante la traducción escrita. Comparando los cambios significativos en la presión arterial sistólica de los participantes masculinos y el ritmo cardíaco de las participantes femeninas durante la traducción escrita, sin diferencias significativas entre la presión arterial y el ritmo cardíaco de participantes masculinas y femeninas a través de la traducción visual, mostró la diferencia en la respuesta al estrés entre los géneros desaparece durante el estrés excesivo.

**Las palabras clave:** estrés, presión arterial, ritmo cardíaco, e género, traducción escrita, traducción visual

#### INTRODUCTION

Stress is a realistic part of human life that helps us to use and concentrate on all our body resources, in critical and challenging situations of life. Little stress enhances normal and professional performance, but when it can exceed the optimal level, it may lead to a destructive impact on human performance (Stranks, 2005). Just as any other human activity, translation involves some degree of stress. However, since translation is a higher-order cognitive activity (Angelone, 2010), the debilitating stress the translator endures during the translation process may remain hidden, even for the translators themselves.

A number of factors can create stress for the translator including the environment surrounding the translator, the translator's psychological and emotional factors (Kurz, 2003), and the task of translation itself. Translation is a problem-solving process (Pym, 2003) where the translator constantly needs to find solutions to tackle and cope with problems arising from the text, the environment, and the psychological and even physiological factors. The problems originating from the text and the process of tackling them leads to constant uncertainty regarding the correctness of the hypotheses and the appropriateness of the solutions in the mind of the translator, consequently, giving rise to the level of stress. Different form of translation, including written translation, sight translation, simultaneous interpreting and consecutive interpreting result in various degrees of stress, as in each of these types different stressors are at work.

There is a consensus among the scholars that interpreting is the most stressful type of translation. For instance, a study conducted by AIIC revealed that interpreting is among high stress professions (Mackintosh, 2002).

However, one question remains empirically unanswered and that is whether written translators and sight translators experience stress during the translation process. Written translation is the most common type of translation where the translator renders a written text in one language into a written text in another language. During this process, the translator may not face time constraints and has the opportunity to consult various resources to manage problems arising from the text, therefore, the process seems to be stress-free or at least low-stress.

Another form of translation that is mostly categorized as a form of interpreting than written translation is sight translation (Dragsted & Hansen, 2009; Lee, 2012; Lambert, 2004) which is mainly used in interpreting programs as a practice activity or aptitude test for entering such programs. Sight translation involves translation of a written text in one language into an oral rendering in another language. A number of factors has made sight translation similar to interpreting which suggest that it is probably more stressful than written translation. According to (Dragsted & Hansen, 2009), although interpreting might seem easier because of the little memory effort due to the translator's visual accessibility to the source text and being more flexible in terms of the speed of delivery, it still remains closer to interpreting than written translation due to the linguistic interference resulting from accessibility to the source text, expectation of speedy delivery and the change in medium (written to spoken).

Although a few scholars have identified and discussed stress in translation (e.g., Moser, 1978; Moser-Mercer, Künzli, & Korac, 1998; Kurz, 2003; Gile, 2009; González, Vasquez, & Mikkelsen, 2012), it is still fairly under-investigated, and many dimensions are inconclusive. Moreover, the major concern of these studies has mainly been on stress in interpreting rather than written or sight translation. Additionally, although a number of studies have focused on teaching translation in the Iranian context (e.g. Moghaddas & Khoshsaligheh, 2019), little research, if any, is conducted on stress in the Iranian translation trainees. Given the importance of stress and developing strategies to control stress to do a successful job (Gile, 2009), this study investigates the stress involved in written and sight translation in the training setting and also seeks to determine whether there is a significant difference between the increase of stress in sight and written translation. In addition, it intends to examine whether the amount of experienced increase of stress is different between men and women.

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## 1. LITERATURE REVIEW

### 1.1. Stress

Stress can be defined as a challenge that disturbs the body's homeostasis (Fink, 2000). When the hypothalamus which controls the autonomic nervous system receives the message of danger, it activates the sympathetic nervous system and secretes a hormone called CRH. Sympathetic stimulation brings about the secretion of epinephrine and a little norepinephrine from adrenal medulla. CRH stimulates secretion of hormone of ACTH from the anterior pituitary, a small endocrine gland just below the hypothalamus. This hormone travels to the adrenal cortex to promote the secretion of cortisol. Cortisol then breaks down fat and protein stores while expanding carbohydrate stores and increasing the availability of blood glucose to sustain nourishment to the brain (Sherwood, 2010) and maintains blood pressure (Talbot & Kraemer, 2007).

Stress can be positive and motivating, known as eustress, or negative and debilitating, known as distress. Eustress also involves managing stress positively when dealing with negative stressor (Olpin & Hesson, 2012). Symptoms of stress are categorized into psychological, cognitive, and physiological levels. Psychological signs involve anxiety, frustration, helplessness, and hopelessness. Cognitive symptoms are problems with decision-making, memory problems and difficulty in concentration (Lewthwaite, 2010). Physiological symptoms include symptoms like increase in blood pressure and heart rate (Stranks, 2005).

Systolic blood pressure is the pressure of blood in arteries as heart beats and diastolic blood pressure is the pressure of blood in arteries when heart relaxes between beats (Kowalski, 2007). Norepinephrine (noradrenaline) which consists of twenty percent of hormones secreted from the adrenal medulla and is also a neurotransmitter, increases blood pressure and epinephrine (adrenaline) increases heart rate during a stress response (Sherwood, 2010). Increased heart rate and blood pressure during stress delivers more oxygen and blood sugar to the brain and muscles to provide more energy for mobilizing mental and physical abilities to meet the challenges more effectively (Aldwin, 2007). Negative conditions at work result in various health risks (Lundberg, 2000). Among common sources of occupational stress, task-related and interpersonal factors as well as individual characteristics can be named. Stressful work situations have certain effects on job performance such as loss of concentration, increased error rates, lack of effective decision-making, and missed deadlines (Stranks, 2005).

One of form of the psychological stress is time pressure which is quite relevant to translation situation. It results from having to get tasks done in less time than would normally be required to fulfill them appropriately (Venes & Taber, 2005). Time pressure is experienced when there is too much to do in too little time (Soriano de Alencar, 2012), as it is the ratio between the required time and available time to do an action (Boy, 1998). Even though time pressure may improve task performance in certain situations, excessive time pressure can often cause errors (Lin & Carley, 2003) because stress impairs cognitive abilities which are important in the decision-making process (Hamilton, 1985).

### *1.2. Stress and translation*

As a higher-order cognitive activity (Angelone, 2010) translation involves constant decision-making on the part of the translator. The decision-making issue is a complex process in translation, since source text and target text stand in an intricate relation considering that translation is not a formal procedure of substitution on the basis of simple one-to-one correspondence and this makes decision-making procedure a critical matter in a translation. When any difficulty appears during comprehension, transfer or production, the translator hesitates, and uncertainty happens. Therefore, pauses are taken as a signal of cognitive processing in translation (Dragsted, 2005) and can be considered as the points where uncertainty happens. On this ground, translation can be considered as a process of uncertainty management. Uncertainty management is defined as the application of strategies for overcoming indecision and includes three strategies in translation: problem recognition, solution proposal, and solution evaluation (Angelone, 2010). These uncertainties and the process of managing them can be regarded as sources of stress for the translator.

Although translation might seem an easy and challenge-free activity, a number of challenges are posed in this demanding process. Specific challenges of translation are meeting deadlines, decision-making, and client satisfaction. Translators are expected to have certain characteristics like having enough knowledge of the source and target languages, creative thinking and production, responsibility and punctuality. The quality of translation, which can be seen as the degree to which a translation satisfies the expectations of evaluators – the end-user, the commissioner of the translation, and/or the reviser (Havumetsä, 2012) – is another challenge of the work of a translator.

There are different opinions about the influence of commissioner on the translation process. Clients and their purpose for the translation are one of the

most important 'sources of tension' for the translator (Malmkjær, 1993). It is because clients determine the purpose of a translation (Vermeer, 2004), and their expectations – which can be fuzzy, implicit and explicit expectations (Ojasalo, 2001) – may sometimes be unclear to themselves, and the dissatisfaction of the expectation can indicate a translation error (mistake). Therefore, defining something as an error is situation-specific (Havumetsä, 2012). From the point of view of commissioner, mistakes happen because of inefficiency of the translator, but in reality, they are made because commissioner's expectations were unclear and because client's (commissioner) expectations are different to the produced translation, mistakes are assumed to be made in the process of translation. All the above-mentioned issues make translation a dynamic process with ever-changing job requirements, since under different circumstances, even the same project can have different final translations – and all of which can be considered acceptable or unacceptable. Here, the concept of error, mistake and quality, as mentioned earlier, are situation-specific, hence it can be inferred that translation, and its various forms including written translation, is a stress-producing activity.

The few studies which have empirically investigated stress in translation have mainly involved simultaneous interpreting. In an experimental study, the effect of time pressure resulting from prolonged time on task on the quality of simultaneous interpreting professionals and their physiological and psychological stress was researched. The results showed that increased stress resulted in significant decrease in their performance quality and their fatigue. Analysis of secreted Cortisol and immunoglobulin A showed an increase in their physiological stress as well. The participants also displayed much more passive and escapist behaviour and felt that they had little control over the situations (Moser-Mercer et al., 1998). In another study, a control and experimental group of student interpreters were studied for their performance on some exercises such as decreasing reaction time and dual-task training. The findings revealed that the control group could perform significantly better (Moser-Mercer, 1978). In a pilot study, the stressfulness of simultaneous interpreting for professional conference interpreters and student interpreters was examined by measuring physiological parameters of heart rate and skin conductance level of the two groups. Two professionals at a medical conference and three students in a simultaneous interpreting class interpreting a text received a week in advance. The results showed with the exception of a slightly higher value at the very beginning, the professional interpreters' pulse rate values remained fixed during the conference, whereas the pulse rate for the student interpreters was clearly higher than that of the professionals, indicating that for the novices even an ordinary classroom situation involves higher physiological stress (Kurz, 2003).

### 1.3. *Sight translation*

Sight translation involves the transformation of a written text in one language into an oral form in another language and is usually carried out by interpreters (Lambert, 2004). Unlike most other forms of translation, sight translation necessitates the change of mode – written to spoken – along with the change of language. Sight translation is performed in different ways, such as when the interpreter is given a written text and can take a relatively brief period to prepare the translation. Or when the interpreter is given an unseen and unfamiliar written text and is asked to provide an on-the-spot translation, or when the interpreter is given a copy of a speech which will be read by a speaker and has to be interpreted simultaneously in the booth (Sandrelli, 2003). It is also popular in interpreting programs either as an activity or course, or as the aptitude test for entering such programs.

Sight translation is reported to have more in common with interpretation than written translation (Dragsted & Hansen, 2009; Lee, 2012; Lambert, 2004). Dragsted & Hansen (2009) consider sight translation as a hybrid between written translation and interpreting. They enumerate differences between sight translation and interpreting (simultaneous and consecutive) including sight translation's requirement of no memory effort, its flexibility in terms of speed of delivery, its higher linguistic interference due to visual existence of source text, and interpreting's smoother delivery. Agrifoglio (2004) holds that sight translation is as difficult as simultaneous and consecutive interpreting since they involve some of the same mental stages. She argues that sight translation involves some added difficulties and efforts including lack of the help of prosodic features of oral language (e.g. tone and hesitations), requirement of more time and effort for understanding written text, and greater risk of source language interference. The process of sight translation involves three stages:

Visual perception of source text, mental translation (cognitive processing of the text), and oral production in the target language (Paez, 2014: 27).

This process requires the connection between the visual and the speech centers in the brain. Therefore, the two areas of the brain are engaged in the process, simultaneously, and this can cause stress (Visintin & Campos, 2010). Compared to written translation, the constraints of sight translation allow much less time for carrying out the processes of producing a target text (Shreve, Lacruz, & Angelone, 2010). While a written translation is a product that can be reviewed and revised at any time, consecutive interpreting, simultaneous interpreting and sight translation, are actions that take place at a specific time and place and there is no such chance for revision (Alvarado-

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Little et al., 2010), and that obviously paves the way for more stressful challenges.

#### *1.4. Stress and gender*

Men tend to have a “fight or flight” response to stress situations, whereas women seem to approach such situations with a “tend and befriend” strategy; that is, during times of stress women take care of themselves and their children (tending) and form group bonds (befriending) (Taylor, 2006). The reason for these different reactions to stress is hormones. The hormone oxytocin, which is released during stress in the body, has a calming effect. The female hormone oestrogen enhances whereas testosterone reduces the effects of oxytocin (Rathus, 2012). The body fat affects the level of oestrogen and testosterone in body (blood). In women, body fat is an oestrogen pump that produces low levels of the hormone (Boyd & Betancourt, 2005). The natural production of testosterone can be low in obese (overweight) men due to higher level of a chemical that binds to testosterone resulting in less testosterone production (Shamy, 2013). Research findings indicate that high testosterone levels in men also relates to better memory (Ackermann et al., 2012). Moreover, findings showed that heart rate increases in women and blood pressure changes in men after confrontation with laboratory stress (Allen, Stoney, Owens, & Matthews, 1993).

The other difference in men and women in terms of stress is in the adopted strategy to cope with stress. Coping refers to cognitive and behavioral efforts to manage stress. Coping is a dynamic process and depends on the characteristics of the individual and the situation. Lazarus & Folkman (1984) classified coping methods into problem-focused, in which some aspects of the stressful situation are changed and emotion-focused, in which one’s emotions are managed during the stressful situation. People tend to use more problem-focused coping when a situation seems changeable, whereas emotion-focused coping is used for situations where the person has little opportunity to change it (Lazarus & Folkman, 1984). Men respond to stress more often by problem-focused coping, whereas women more often use the emotion-focused method. This arises in part from common gender stereotypes such as the independent, task-oriented man and the dependent, emotionally expressive woman (Zwicker & DeLongis, 2010). For both men and women, work stressors are associated with greater use of problem-focused coping (González-Morales, Peiro, Rodríguez, & Greenglass, 2006). By and large, individuals cope in ways that match the particular stressor at hand (Zwicker & DeLongis, 2010). This study aims to determine whether male and female



translators' coping method is different while completing written and sight translation tasks in training settings.

## 2. METHODS

Based on a mixed-methods design, the research consists of two phases. In the quantitative phase, the blood pressure and the heart rate of the participants were measured when they were completing the written and sight translation tasks assigned. In the qualitative phase, the participants were retrospectively interviewed after the translations were completed. In the quantitative phase, the following questions were designed to be addressed:

1. Is there a significant difference between the systolic blood pressure, the diastolic blood pressure, and the heart rate of the participants before and during written translation in training setting?
2. Is there a significant difference between systolic blood and diastolic blood pressure, and the heart rate of the participants before and during sight translation in training setting?
3. Is there a significant difference between the systolic and diastolic blood pressure, and the heart rate of the participants throughout sight translation and written translation in training setting?
4. Is there a significant difference between the systolic blood pressure, the diastolic blood pressure, and the heart rate of the male and female participants throughout the written translation in training setting?
5. Is there a significant difference between the systolic blood pressure, the diastolic blood pressure, and the heart rate of the male and female participants throughout the sight translation in training setting?

Based on a criterion sampling technique, 20 master's students of English translation and 20 undergraduate students of English translation (with a ratio of males to females, ten to ten) were invited to participate on a voluntary basis. The participants were chosen to be at top ten percent of their class based on their grade average point, native speakers of Persian and had a highly efficient command of English as a foreign language. They were not screened using a test for their English, because as students of English translation, they had been admitted through a nation-wide university entrance examination which includes a proficiency module, passing of which successfully is required for admission. The participants were in their twenties or early thirties, all of whom were assigned the exact same task in a very similar setting. As for their weight, no heavy volunteer was included in the study, as belly fat can be an intervening variable for such stress-related research (Ackermann et al., 2012).

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The participants were asked to translate a paragraph of an academic text in English through written translation and the following paragraph through sight translation. While the paragraphs did not contain any advanced terminology or expressions which the participants would need consulting a dictionary, some of the grammatical structures made the translation relatively challenging. The paragraphs were on the same topic and right next to one another in the introduction section of the source article and had similar readability, having been subjected to the qualitative evaluation of two lecturers of English as a foreign language. The researchers measured changes in blood pressure (mmHg) and heart rates (bpm) with a wrist digital blood pressure monitor set, recommended, and approved by several medical experts (Samsung Healthy Living SHB-200) considering all the measurements were taken with one same device and the aim was to compare the measurements, the device was not an intervening variable.

To collect data, an individual session was arranged for each of the participants to prepare and familiarize them with the task. Because the participants were students and the researcher could not have access to them outside their universities and provide a place to do the research. For the actual task, in separate sessions, first, the participants were asked to translate a source text from English to Persian in writing. They had the needed time to finish their translation satisfactorily and their blood pressures and heart rates were measured and recorded before and in the middle of the processes. Then they were given some time away from doing the translation to rest so that their blood pressures and heart rates returned to their baseline values by comparing to first measurement. Next, the measuring was repeated before and during the sight translation of the similar following excerpt (the second paragraph extracted from the same text).

To analyse the collected data, matched *t*-test and ANCOVA statistical methods were used. Matched *t*-test was used to determine if there is a significant difference between the blood pressure and the heart rate of the participants before and during the written and sight translation tasks. The ANCOVA statistical method was used to determine if there is a significant difference between the blood pressure and heart rate of participants during the written and sight translation.

In the qualitative phase, to gain deeper insights into stress experienced by the participating translator trainees, the participants were interviewed and were asked to retrospectively reflect on the tasks, which they had just completed to understand if they were aware of the experienced stress during translating, considering their signs. The qualitative inquiry aimed at addressing the following questions:

1. What signs have the participants usually undergone when under stress?
2. Did the participants feel stress immediately before the experiment?
3. Which task, written or sight translation, was more stressful to the participants?

### 3. RESULTS AND DISCUSSION

Matched *t*-test was used to address the first research question which investigated if there was a significant difference between the systolic blood pressure, the diastolic blood pressure, and the heart rate of the participants before and during written translation. In terms of systolic blood pressure, between the scores before written translation ( $M=12.7$ ,  $SD=2.49$ ) and during written translation ( $M=12.9$ ,  $SD=2.45$ ), there was no significant difference,  $t(39) = 0.772$ ,  $p > 0.05$ . In terms of diastolic blood pressure, between the scores before written translation ( $M=8.3$ ,  $SD=1.54$ ) and during written translation ( $M=8.5$ ,  $SD=1.15$ ), there was no significant difference,  $t(39) = 1.113$ ,  $p > 0.05$ . In terms of heart rate, between the scores for the heart rate before written translation ( $M=79$ ,  $SD=11.66$ ) and during written translation ( $M=83$ ,  $SD=10.74$ ), there was a significant difference,  $t(39) = 3.579$ ,  $p < 0.05$ .

The results of the analysis of the data gathered to answer the first question showed that apparently because of adequate time to revise the translation and ready access to different sources for data mining (as stated in the interviews), written translation was not perceived to be overly stressful to call for norepinephrine which, as Sherwood (2008) states, consists of 20% of hormones secreted from the adrenal medulla during any stress response and which causes significant change in blood pressure during the process of completing tasks. However, the need for the selection of the appropriate target text style, structural and lexical choices in written translation can raise the need of supplied energy for the brain cells and the heart rate seems to increase, due to the secretion of epinephrine (adrenaline) to speed up bloodstream, and consequently to supply the oxygen and energy (glucose) required in the brain. These results showed that written translation is not substantially stressful, probably because the translator has time to think and make decisions as well as consult dictionaries and other resources. Nevertheless, having access to different options does not guarantee making the best choice, and it can still result in written translation's being a stressful activity.

Matched *t*-test analysis was used to address the second research question which investigated if there is a significant difference between the systolic blood pressure, the diastolic blood pressure, and the heart rate of the participants before and during sight translation. In terms of systolic blood

pressure, between the scores before sight translation ( $M=12.5$ ,  $SD=2.34$ ) and during sight translation ( $M=14.0$ ,  $SD=2.64$ ), there was a significant difference  $t(39) = 3.332$ ,  $p < 0.05$ . In terms of diastolic blood pressure, there was a significant difference in the scores before sight translation ( $M=8.3$ ,  $SD=1.57$ ) and during sight translation ( $M=8.9$ ,  $SD=1.47$ );  $t(39) = 2.442$ ,  $p < 0.05$ . In terms of heart rate, before sight translation ( $M=78$ ,  $SD=11.16$ ) and during sight translation ( $M=83$ ,  $SD=12.56$ ), there was a significant difference,  $t(39) = 4.837$ ,  $p < 0.05$ .

The results of the data gathered to answer the second question seem to indicate that sight translation tends to be a stressful activity. The stress can be explained by the fact that there was not much time between subjects being given the text and having to produce the oral rendition of this text, and the fast communication between different parts of the brain calls for a spurt of energy which needs to be supplied immediately, with high speed and strength (Visintin & Campos, 2010). Sight translation can be more stressful than other modes of interpreting because reading and listening in cognitive psychology are not similar because written text are usually more complex syntactically, lexically and stylistically than oral speech and source text remains available to the translator during the task and becomes a source of interference as translators' eyes and attention are drawn to it (Agrifoglio, 2004). Along the same lines, as stated by Sherwood (2008), the two hormones epinephrine and norepinephrine, secreted by the adrenal medulla and neural cells, work together to increase heart rate and blood pressure.

To address the third research question, which investigated if there was a significant difference between the systolic blood pressure, the diastolic blood pressure and the heart rate of participants during sight translation and during written translation, ANCOVA was used. In terms of systolic blood pressure, there was a significant difference between the systolic blood pressures after controlling for the pretest systolic blood pressure,  $F(\text{Group}) = 5.292$ ,  $p < 0.05$ . In terms of diastolic blood pressure, there was no significant difference between the diastolic blood pressures, after controlling for the pretest diastolic blood pressure,  $F(\text{Group}) = 2.449$ ,  $p > 0.05$ . In terms of heart rate, there was no significant difference between the heart rate after controlling for the pretest heart rate,  $F(\text{Group}) = 0.952$ ,  $p > 0.05$ .

The results of the third research question showed that there was a significant difference between systolic blood pressure of the participants when doing sight translation and their systolic blood pressure when doing written translation probably because the change in systolic blood pressure was little during written translation, but its change was substantial during sight translation. The results should show a significant difference in the diastolic blood pressure because the changes in diastolic blood pressure were little

during written translation, while its change was significant during sight translation; however, it did not happen. The changes in the heart rate during the two translation tasks were significant, and so when they were compared, no significant difference was seen between the two tasks.

To address the fourth research question which investigated if there was a significant difference between the systolic blood pressure, the diastolic blood pressure, and the heart rate of the male and the female participants when doing written translation, ANCOVA was used. In terms of systolic blood pressure, there was a significant difference between the systolic blood pressure when doing written translation after controlling for the written pretest systolic blood pressure,  $F(\text{Gender}) = 7.730$ ,  $p < 0.05$ . In terms of diastolic blood pressure, there was no significant difference in the diastolic blood pressure when doing written translation, after controlling for the written pretest diastolic blood pressure,  $F(\text{Gender}) = 0.104$ ,  $p > 0.05$ . In terms of heart rate, there was a significant difference when doing written translation, after controlling for the written pretest heart rate,  $F(\text{Gender}) = 4.117$ ,  $p < 0.05$ .

As for the fourth research question, according to Allen and colleagues (1993), increase in blood pressure can happen because vascular reactivity is higher in men, whereas increase in heart rate could be due to higher cardiac reactivity in women. It is true that translators can seek advice in written translation, but translators often work alone, so the process of translating is similar in men and women and considering decision-making and problem-solving issues, the process of translation is clearly stressful.

To address the fifth research question which investigated if there was a significant difference between the systolic blood pressure, the diastolic blood pressure and the heart rate of the male and female participants during sight translation, ANCOVA was used. In terms of systolic blood pressure, there was no significant difference between the male and the female participants' systolic blood pressure during sight translation, after controlling for the pretest systolic blood pressure,  $F(\text{Gender}) = 0.457$ ,  $p > 0.05$ . In terms of diastolic blood pressure, there was no significant difference between the male and female participants' diastolic blood pressure during sight translation, after controlling for the sight translation pretest diastolic blood pressure,  $F(\text{Gender}) = 0.460$ ,  $p > 0.05$ . In terms of heart rate, there was no significant difference between the male and female participants' heart rate during sight translation, after controlling for sight translation pretest heart rate,  $F(\text{Gender}) = 3.918$ ,  $p > 0.05$ .

The results of the fifth question indicated that there was no significant difference in the level of stress experienced by the two groups of male and female participants because as Zwicker and DeLongis (2010) state, people cope in ways that match the stressor and since sight translation, owing to its

associated time pressure for translators regardless of gender, is challenging and stressful, no difference in the level of stress experienced by the two groups was observed. In sight translation, female translators have to present their translation in a few minutes and without consulting a dictionary or other external or social sources, and they have only their own skills and expertise to rely on; this makes their coping method quite similar to that used by the male participants. So, as they have to trust almost only their own expertise, they need to learn how to make decisions without external support (Bernardini, 2004).

To obtain qualitative insight into the state of awareness of the participants about their experience of stress, they were interviewed and asked to retrospectively think aloud regarding the translation tasks which they had just completed. In response to the question regarding the main signs and events they typically experience or observe under stress, almost all the participants indicated to an increase in heart rate as the most common sign.

Raised heart rate is a prerequisite to mobilize the body in stressful situations. While it was reported as the most common sign in the interviews, it was also evidentially observed during both translation tasks. Cognitive signs like decreased comprehension, slower processing of new information and difficulty in decision making which all can be problematic in sight translation were among the less commonly reported signs in the interviews. Stammering and stuttering which can be severely problematic in sight translation were observed in participants' performances too.

In response to the question, whether they felt stressed at the beginning of the translation tasks, over half of the participants claimed that they were not stressed. However, review of the measurements of their blood pressure and heart rate in the quantitative phase revealed that all the participants had a higher blood pressure and heart rate. Besides considering the possibility of their not reporting their stress truthfully – perhaps to save face – it could only be assumed that they were unaware of their stress. This unawareness might be attributed to either the exiguity of this difference for conscious identification or the participants' obliviousness of such physiological signs of stress. Their reluctance to report stress could also be ascribed to their disinclination to reveal the fact which translation was stressful even for translators under formal training.

In response to the question, asking which of the two translation tasks was more stressful, almost all the participants admitted that sight translation was more stressful. The main reasons offered in the interviews included not being able to consult a dictionary or similar sources, limited time to think, not having the opportunity to review the translation, not having the opportunity to

revise the translation for clarity and accuracy, and of course not having prior experience in sight translation. Few of the participants also stated that they found the written translation more stressful. They justified the choice of written translation on the grounds that written translation, unlike sight translation, should be accurate, that is to be correct and true in every detail and should preserve the style or textual features of the original text in target text. The quality of both translations was assessed, crossing out as sign of uncertainty in written translation and pauses and correcting as sign of uncertainty in sight translation

#### CONCLUSION

By considering the limitations of this research, it could be concluded from the results of the blood pressure and heart rate measurements that written and sight translation were both stressful for training translators in training setting, while a sight translation task was shown to be more stressful than written translation task under similar conditions. The interview data similarly confirmed such conclusions. It was revealed that the participants were anxious about decision making in both translation tasks and specifically in sight translation, due to the absence of sources to consult, which could have helped to reassure them of their choices. Time pressure in sight translation allows little time for processing all the available translation options, and it leads to resorting to strategies of summarizing and omission (Gile, 2009) as the translation performance evaluation of the participants revealed. Speaking the translation out when the translator is not confident of the appropriateness of the translational choices and when clients' expectations are not clear can cause disfluency, stammering, and stuttering in the presentation of translation, qualities which were observed in performances of the translation students participating in this study.

The mode shift in sight translation also seems to be stressful for student translators that are not used to speaking their translation out. Not having the opportunity to review and revise made the process of decision making more difficult, as the student translator searches his/her memory for the best choice before making the final decision. Being inexperienced in sight translation as students and lack of needed skills can result in loss of concentration which in turn leads to increase in error rates. Two areas, visual and speech centres, in the brain are involved in the process, simultaneously, and the required fast communication between them can cause strain on the brain. Coping with written translation can be different between the two genders since women comparing to men who try not to get help from others, considering the time they have, can use advice or help from others but seeking help is impossible in sight translation and translators should use their internal support that makes the difference in coping method between the two genders disappear.

This study used recorded changes in the blood pressure and heart rate of the student translators, to measure stress levels by employing wrist blood pressure monitoring in training settings. The conclusions of this study are limited to the non-random sample of graduate and undergraduate students from two universities in a city in the North-Eastern part of Iran using two short excerpts of an academic text. To further clarify and complete the findings of this research, future studies are recommended to use other methods of measuring stress, more accurate and multiple devices, in various settings and environments and larger samples on other genres and text types.

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