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The Relationship between Selective Attention and Simultaneous Interpreting Performance in Undergraduate Students of Translation

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Abstract

Complexity of simultaneous interpreting has long attracted the interest of researchers and led them to explore different linguistic, psychological, cognitive, social, and neurological factors involved in enabling the human mind to perform such a difficult task. Within the framework of cognitive studies of interpreting, the authors of this study aimed at exploring the relationship between selective attention and interpreting performance of undergraduate students of Translation. Interpreting performance was evaluated in terms of content and presentation. A sample of 72 BA students participated in the study and completed a simultaneous interpreting and a selective attention task. Quantitative analysis of the data obtained from the participants led to the conclusion that selective attention had a direct relationship with both content and presentation of simultaneous interpreting performance in the sample as significant correlation was found to exist between the variables. The findings suggest that students with better selective attention are likely to perform better in interpreting tasks, especially in terms of the content of their performance which is concerned with completeness and accuracy of informational content of the interpreted message.

Keywords: Simultaneous Interpreting, Selective attention, Content, Presentation, Cognitive interpreting studies

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1. Introduction

Interpreting, in its many forms, has proved extremely useful to global communication over the past decades. From court and medical interpretation in smaller settings, to simultaneous and consecutive conference interpretation at large international events, interpreting has often been considered a means of making communication across languages and cultures possible (Pöchhacker, 2013). Guo (2020) enumerated factors such as growth in international and intercultural contact, trade agreements, conquests, conflict and peace treaties among powers, acceleration of globalization and increase in immigration as contributing to expansion of demand for interpreters and consequently professionalization of the practice since early twentieth century. This, in turn adds to the need for research in the field of interpreting to help us understand the diverse and complex underpinnings of this activity.

As Pöchhacker (2010) pointed out, the research trends in interpreting tend to be based on two main theoretical frameworks, one that is concerned with interpreting as a cognitive process and one that regards it as an interactive discourse process; and each of these frameworks forms different interdisciplinary binds with disciplines such as cognitive psychology and interactional sociolinguistics. With respect to the line of research that is concerned with cognitive process of interpreting, Seeber (2015) considered the cognitive activities that trigger the interpreting task, suggesting theories that foresee the results, and models that explain the procedures for yielding them as the main interests of scholars working within this framework and says they normally examine actions and apply the findings to infer about the deep cognitive processes that we cannot directly see. Liu et al. (2004) clarified the reason for this interest in cognitive studies of interpreting by stating that it had been observed that simultaneous interpreting (SI) is a burden on the person's mental resources so that interpreters working in the simultaneous mode repeatedly seem to work close to the overload level of their

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mental resources. If the interpreter's cognitive resources reach this saturation level, performance is likely to deteriorate.

Clearly, a good command of general linguistic skills is not enough to succeed as an interpreter. As Brisau et al. (1994) stated, there are non-linguistic factors at work in the process of interpreting in addition to the linguistic ones. These non-linguistic factors include psychological and neuro-linguistic features (ibid.). Previous studies in the field have tried to investigate issues such as the role of selective attention in second language acquisition (Oishi, 2007), the role of working memory in interpreting (Liu et al., 2004; Mizuno, 2005), shared attention in sight interpretation and SI (Lambert, 2004), and the factors contributing to individual differences in the development of consecutive interpreting competence (Cai et. al., 2015). Other studies have tried to investigate whether interpreting expertise will affect development of cognitive abilities, such as selective attention and working memory (Ghiselli, 2020) or cognitive flexibility and inhibitory processes (Yudes et al., 2011).

Tomlin and Villa (1994, as cited in Oishi, 2007, P.186) state that "overwhelming amounts of incoming information force the attentional system to be selective". Also, Liu et al. (2004) claim that in different fields and activities, experts are better at selecting the more significant portions of information to process and spend less energy on processing chunks of information that are less. It can be argued that in the process of SI, interpreters are indeed faced with "overwhelming amounts of incoming information" and the fact that they must focus on conveying that information in another language at the same time, with a lag of a few seconds at most, can only be assumed to make the task harder. Thus, they must be able to concentrate on the more relevant chunks of information in order to manage their limited resources. This has led the researcher to question whether the ability to be selective in terms of attentional resources can affect the performance of student interpreters in SI tasks.

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The present study was an attempt at investigating a cognitive ability, namely selective attention (SA), and its potential relationship with SI performance. Scholars working in the cognitive domain have claimed that interpreting, particularly SI, involves "appropriate management of attentional resources, coordinating and balancing the demands of receptive, productive and storage processes" (Pöchhacker, 2013, p.67) and that interpreters must direct their attention to various activities that they must concurrently manage (Kalina, 2015). Moser-Mercer (2000) reported a study that revealed "the ability to sustain attention for any length of time and to filter out noise" (p. 89) to be among the most significant cognitive sub-skills that cause difficulties for novice interpreters. Liu et al. (2004) claimed the ability of remaining focused and blocking interference, or in other words, the ability to control attention, is a primary ability for an interpreter. Timarová (2015) also considered "one aspect of attention, namely the ability to ignore distractors… an integral part of professional interpreting skill" (p. 446). Camayd-Freixas (2011) further emphasized the role of selective attention in the SI process by stating that attention must be led to different tasks selectively in the delivery and construction sequence as man's data management can perform merely in one route at a time.

Nevertheless, the existence of a relationship between selective attention and SI performance has, to a large extent, gone unnoticed in the literature. Thus, this study will try to address this issue by first presenting a review of the literature in the fields of interpreting and attention and some of the empirical studies that are concerned with the relationship of the two fields. Later, methodology of the paper will be discussed in detail and finally, the results will be presented and discussed to present the findings of the research.

2. Review of Literature

2.1. Interpreting

Seeber (2011, p.185) has defined interpreting as "the process of cross-linguistic transfer of meaning in real time". The fact that interpreting is done "in real time" differentiates its process, and to some extent its product,

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from the translating process and product. Hale (2007) accounted for such differences by pointing to the fact that translators have access to the full text to be translated and can resort to a number of resources for research, comprehend the full message and then start producing their target text which usually includes several drafts; interpreters, however, need to deal with the source material in real time, with no access to aids or resources and no opportunity to edit and refine their target utterance. Moreover, with respect to the product of their practice, translated material tends to be more target-oriented while interpretations are more source-oriented (Hale, 2007). The interpreting product is also usually shorter than the input which indicates some loss of information in the process (Christoffels & De Groot, 2009).

Gile (2009, p.53) stressed the fact that many interpreting errors are the result of "cognitive saturation or improper management of the interpreter's processing capacity". Seeber (2011) also believed some of the factors that limit comprehension and production of language become persistent in such a complex task as SI where a combination of comprehension and production is at work. Furthermore, the simultaneity of multiple cognitive tasks might pose new limits which are either consequence of combination of the component tasks or their effect is not apparent when performing a single task and becomes amplified after combination of processes (Seeber, 2011).

Interpreting is done in different modes and settings and thus can be classified according to social context (inter-social or intra-social), constellations of interaction (bilateral or multilateral), language modality (spoken or signed), working mode (consecutive or simultaneous), directionality, use of technology, and professional status (Pöchhacker, 2004). From the various modes of interpreting, simultaneous mode has attracted the most attention during the past decades, probably due to the difficulty and even seeming impossibility of the task and the fact that it is the most common mode of the practice and the most convenient for the clients.

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Setton (2005) claims there are four pre-requisites for SI: first, proficiency in the active and passive languages involved; second, having information about the context to allow inference; third, proper access to sound and vision; and fourth, training to make effective use of linguistic proficiency, extra-linguistic knowledge and attention allocation. Training can help interpreters overcome attentional conflict and pay close attention to various procedures with different levels of concentration, while reassured by computerization of some steps, and by more easily organized, overlearned language assets for construction. Novice interpreters, however, might experience the process as multitasking which leads to higher cognitive load (Setton, 2012).

2.2. Attention

In our everyday life, we are constantly surrounded by incoming information from various sources that stimulate our sensory channels. Attention allows us to attend to those portions of incoming information that is of relevance or importance to us at any given moment because whatever is focused on becomes noticeably accessible to us. As we know about something, that knowledge is preserved in our short-term working memory. However, those portions of incoming information that are not attended to, do not enter working memory, and thus are discarded from our information processing faculties (Styles, 2014).

Wickens and Carswell (2012) conceptualize attention as having three modes, namely selective attention, focused attention, and divided attention and discuss the relationship between these three modes: selective attention is concerned with choosing the information to be processed; while focused attention consists of sustaining the processing of the chosen information while excluding irrelevant input; and finally divided attention refers to the processing of more than one input at a given time.

Wickens et al. (2003) referred to four factors as influencing selective attention, namely salience, effort, expectancy, and value. Salient features capture attention, with auditory stimuli generally more salient than

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visual ones; expectancy points to the information about the likely time and place of knowledge accessibility, and determines the function of signaling guiding attention; value is basically the importance of the information and refers to the significance of knowing that knowledge is performing practical functions, or the expense of losing significant knowledge; effort is a negative factor and is involved in moving attention from one portion of information to another.

Wickens and Carswell thus proposed a model called SEEV: P (A) = S – EF + EX × V (where S stands for saliency, EF stands for effort, EX stands for expectancy, and V stands for value) and stated that a suitable pattern could decrease the four factors to two by highlighting important information (correlating salience and value) and by reducing the energy needed to gain precious and applicable resources (Wickens & Carswell, 2012).

One interesting example of the functioning of selective attention is the famous Cocktail Party Effect, introduced by Cherry in 1953. The idea is that in a crowded place, such as a party, when numerous individuals are speaking simultaneously and there is a lot of noise, each person somehow manages to follow the conversation in which he or she is taking part and to ignore the distractors of the environment. According to Oberfeld and Klockner-Nowotny (2016), the process of speech recognition in such a situation requires selective attention and has even been proposed as its best real-life example (Pashler, 1998). However, even people with normal hearing ability show radical individual differences with respect to the ability to identify speech in background noise.

Accordingly, one area of studies in selective attention, called Focal Attention Studies is concerned with cases where subjects are instructed to focus on a specific subgroup of the stimuli and ignore other stimuli in the environment (Cohen, 2006). Dichotic listening tasks are usually used in such studies. In these tasks two auditory messages are presented to the participants at the same time from two different channels (two ears) and

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they are instructed to attend to one channel while ignoring the other, for example by shadowing the message from the attended channel (Cohen, 2006).

2.3. How Is Attention Relevant to Interpreting?

Pettersson (2001, p. 115), defined attention as the process of "selecting parts from all available sensory information, and from memorized information, for further mental processing". Cowan (2000) pointed to the significance of attention in hindering unrelated data, concentrating on the purpose of the given task, and succeeding in acting in line with that goal. When one thinks of the process of interpreting from a cognitive point of view, a connection can be drawn between elements of these accounts of attention and the process of interpretation.

Furthermore, Pöchhacker (2013), pointing to research in the field of cognitive sciences, stated that interpreting, particularly in simultaneous mode, depends on proper control of attentional resources, harmonizing and matching the requirements of responsive, prolific, and saving procedures. In other words, the interpreter must be able to recognize which parts of the stimuli and which stages of the process requires more attention and to avoid distraction by irrelevant distractors in the environment.

One major issue is the role that attention plays in the process of interpreting. Liu (2008) claimed the interpreter's attention must be brought to chunks of information so that they produce more significant amount of data. In case of the interpreter's failure to concentrate on the pieces of data, the outcome might be disorganized and confusing.

As mentioned before, attention has been considered to include three modes: divided attention, focused attention, and selective attention (Wickens & Carswell, 2012). Camayd-Freixas (2011) counted management of selective attention as a crucial part of SI by stating that the interpreter must use his/her attention capacity

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efficiently by dedicating enough attention to each of the listening and production sides and recognizing the time to switch from listening to speaking or vice versa. Brisau et al. (1994) also highlighted the connection between selective attention and interpreting process by stating that if [the interpreter] possesses a high capability of automated linguistic processing, his/her potential for selective attention could be kept for the more complex tasks of one's job. This means selective attention is involved in the non-automatic processes of comprehension and production.

Camayd-Freixas (2011) proposed a theory based on the idea that comprehension, i.e. listening, is mostly passive with regards to mental processing while production, i.e. speaking, demands more attention. He then assumed that allocation of attentional resources during SI "tends to favor the production side (formulating-delivering-monitoring) by a margin of 40/60 to 30/70" (p. 12). Figure 1 demonstrates Camayd-Freixas' conceptualization of attention allocation during comprehension and production phases of SI.

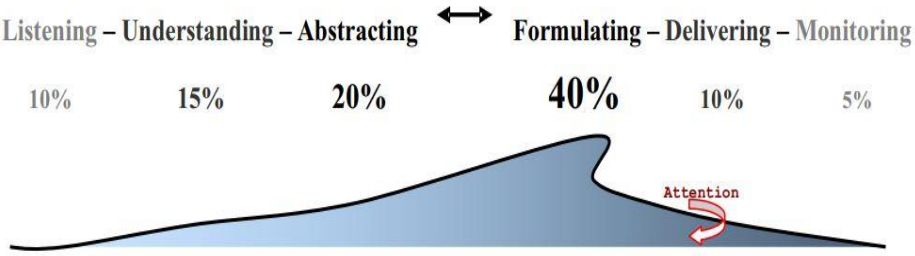


Figure 1. Attention allocation during SI (reprinted from Camayd-Freixas, 2011, p. 13)

Not surprisingly, the whole process takes place in a very rapid speed and is repeated for each segment of the input. Camayd-Freixas (2011) believed that after the formulation phase, that is, after the interpreter has decided

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what to say, delivering and monitoring phases became mostly automatic and most of the interpreter's attention capacity could switch back to listening, hence making a difficult and demanding task such as SI possible to carry out.

2.4. Empirical Studies

Most of previous empirical studies concerned with the cognitive processes of interpreting have focused on working memory and expertise (Babcock et al., 2017; Dong et al., 2018; Kopke & Nespoulous, 2006; Liu, 2008; Timarová et al., 2014; Tzou et al., 2012; Zhang & Yu, 2019). For example, Zhang and Yu's (2019) study set out to compare students with different levels of expertise in interpreting to find out what role the interplay between working memory and expertise plays in managing the challenges of the SI process. They found that in cases where other factors were equal, expertise played a more prominent role than working memory, and when the task was more challenging, expertise proved helpful in neutralizing the difficulties created by working memory limitations. They also found that in beginner students working memory played a more prominent role while in more advanced students expertise was more helpful. These results are interesting since they highlight the role of expertise in improvement of interpreting performance rather than focusing solely on the cognitive faculties.

Timarová et al. (2014) focused on the central executive functions of working memory (including inhibition of distractors, automatic response inhibition, updating, and attention switching) in the process of interpreting rather than on working memory capacity. They investigated their research question in professional interpreters and found that while inhibition of distractors (the ability to focus attention and resist influence of distractors) seems to be related to interpreting experience, the other functions do not. They also found that different functions of working memory affect different sub-processes of SI such as interpretation of numbers, extent of vocabularies used, and EVS (Ear-Voice Span).

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Liu et al. (2004) compared the performance of expert and student interpreters with similar cognitive abilities and different domain-specific skills in the task of SI and found that expert interpreters who were similar to students in their overall working memory storage outperformed student interpreters. They counted the ability to select the more relevant ideas of the input as one of these domain-specific skills which distinguished expert interpreters from student interpreters: professional interpreters were selective about what to interpret and what to leave out in order to manage limitations of their working memory resources. Thus, the study also highlighted the role of expertise in development of interpreting skills.

Among the studies investigating the development of cognitive faculties as a result of interpreting expertise, the one by Kopke and Nespoulous (2006) investigated the question in groups of expert and novice interpreters and two control groups by tests of short-term retention and processing, listening span, category and rhyme and Stroop. They found no difference between the groups in short-term retention and selective attention and measured by Stroop task, while in the more complex tasks which involved storage and processing and required use of semantic strategies novice interpreters performed better than both expert and control groups. They explained their findings in terms of the more prominent role played by working memory in novice interpreters in managing the pressure created by the cognitive overload they experience, while in the performance of experts, other processes might become prominent and supersede working memory.

More recently, Ghiselli (2020) conducted a longitudinal empirical study on two groups of translation and interpreting students over the course of 19 months to investigate the effect of interpretation training on the development of working memory and selective attention of the participants in the interpreting group. The participants were tested at the beginning of their Master studies, after the first year of training, and after two years of training. The researcher's hypothesis was that interpreter training would enhance the cognitive abilities over time and after finishing the program, interpreting students would show higher scores in working memory

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and selective attention tasks compared to translation students. However, contrary to the findings of previous literature, no meaningful difference was found between the interpreting and translation students in her sample.

Although selective attention is closely linked to working memory, as mentioned earlier, aspects of the former are largely taken for granted in the literature and it seems further research is needed to investigate its contribution to the process of interpreting. While most studies assumed selective attention played some kind of role in the process of interpreting, the nature of this role was not the topic of much discussion in the field and in the few cases where it was studied, the results were inconclusive. This study was an attempt at closing this gap in the literature by investigating the relationship between selective attention and SI performance in undergraduate students. Thus, the following research questions were raised:

1. Is there a significant relationship between selective attention and SI performance in undergraduate students of translation in terms of content?

2. Is there a significant relationship between selective attention and SI performance in undergraduate students of translation in terms of target language presentation?

3. Method

3.1. Participants

Since the study is not concerned with professional interpreters and since interpreting is not offered as an independent major in Iranian universities, the study investigated the research questions in undergraduate translation students. Thus, the participants of the study were selected conveniently from translation students at B.A level in Bu-Ali Sina University. The total number of participants was 72 (25 males; 47 females; age range

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20 to 25). They were in the sixth, seventh or eighth semester of their studies and had received at least one semester of interpretation training.

3.2. Instruments

3.2.1. Auditory Selective Attention Test

Auditory selective attention task using the Coordinate Response Measure (CRM) corpus (Bolia et al., 2000), which is a dichotic listening task, was used to measure selective attention of the participants. The corpus included "combination of eight call signs ("Arrow," "Baron," "Charlie," "Eagle," "Hopper," "Laker," "Ringo," "Tiger"), four colors ("blue," "green," "red," "white"), and the numbers between one and eight" (p. 1065). The format of the sentences was: 'Ready [Callsign] go to [Color] [Number] now' (for example: Ready Charlie, go to blue 2 now).

The corpus was converted from binary (.BIN) files into wave (.WAV) and from stereo to mono files using Cool Edit Pro. A total of 80 sentences (10 for each call sign) by four talkers (two males and two females) was selected randomly from the corpus and consequently converted to a single .mp3 file where the sentences were played continuously with at least one sentence interval between repetitions of any given call signs. Half of the sentences (sentences containing the call signs Charlie, Hopper, Laker, and Ringo) were presented to the right channel and the other half (sentences containing the call signs Arrow, Baron, Eagle, and Tiger) were presented to the left channel simultaneously.

The participants were instructed to follow a specific call sign and report the color and number mentioned by the talker in the sentences that contained the assigned call sign. Each call sign was present in only one channel. Each participant was provided with an instruction sheet, giving basic information on the nature and structure of the text and specifying the call sign to be followed. Then "the percentage of correctly identified color–number combinations" (Bolia et al., 2000, p.1065) was used to measure each participant's selective attention.

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3.2.2. SI Task

The stimulus selected for evaluation of SI in this study was a pedagogical speech designed for SI at beginner level by Helen Campbell from European Commission's My Speech Repository and the topic was 'walking'. The measure used for the evaluation of interpreting performance of the students was the rates given by two raters. The students' performances were assessed for content and target language presentation, as these two were the most wide-spread criteria for assessment of interpreting according to Pöchhacker (2004).

Content is concerned with correspondence to the source language material and target language presentation is concerned with expression and delivery. Thus, a rubric was developed by the researcher (along with an expert) where omission of words or full sentences, as well as mismatch in informational content were to be considered in scoring content; while choice of words, target language style or sentence structure, as well as coherence of the message were to be taken account of in scoring TL presentation (See Appendix B).

3.3. Procedure

Under the special circumstances caused by the Covid-19 pandemic, the data collection procedure was conducted online. First, two minutes of the speech on 'walking' was played for the participants and they were asked to record their voice while simultaneously interpreting the material. They were then asked to send their recorded voice to the researcher's contact number. The procedure was carried out in a single session.

In the next step, the researcher sent each participant the instruction sheet for auditory selective attention test that included information and instruction on the purpose and structure of the task and specification of the call sign to be followed. Participants were instructed to use headphones and the dichotic listening task using CRM corpus was administered to test auditory selective attention. The participants were required to write the color-

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number combinations they detected in the sentences containing their assigned call signs and then send the completed sheet to the researcher. The sheet also included an informed consent clause to be agreed by the participants (See Appendix C).

The SI task was rated by the researcher as well as a second expert rater who holds MA in TEFL. The transcription and a tentative translation of the material (See Appendix A) as well as a rubric (See Appendix B) developed by the researchers provided to reduce subjectivity of ratings. The raters were instructed to mark the number of occurrences of each error in the interpretations of the participants and subtract the points specified for each error from a total of 10 for content and presentation. In cases where there were discrepancies between the rates given by the two raters, the mean value of the two rates were considered for statistical analysis.

3.4. Design

The independent variable in this study was selective attention and the dependent variable was performance in SI in terms of content and presentation. The study was of correlational research type since it tried to investigate whether there was a significant statistical relationship between the two variables. The investigation of the research questions was done ex post facto, studying the variables after the fact with no intervention or manipulation from the researcher.

3.5. Data Analysis

The data was analyzed quantitatively. After calculating the scores of SI task and selective attention test, the scores of the latter were statistically compared to the scores of SI task in both content and presentation. Pearson correlation coefficient test was used via IBM SPSS Statistics Version 26 to investigate the correlation between selective attention and the two facets of SI task and answer the research questions.

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4. Results and Discussion

4.1. Preliminary Results

Table 1 shows descriptive statistics of the variables. As the table demonstrates, the mean value for participants' ratings in 'selective attention' was, relatively high (M = 8.17). Moreover, the average rate achieved by the participants in the 'content' aspect of SI performance was lower than their average in 'presentation' aspect of SI, which means most of the errors in SI performance were concerned with informational content of the source material and included either omission of words and sentences or erroneous transfer of information rather than use of improper lexicon or clumsy sentence structures or incoherent delivery.

It is also notable that, according to Table 1, the data for all three variables is within two standard deviations from the mean. The SD value for selective attention is higher than either of the aspects of SI performance. The SD value for SI content and SI presentation is 1.31 and 1.28 respectively which is indicative of the fact that the ratings of interpreting performance were not too dispersed and the difference in competency level of the participants was not substantial.

Table 1. *Descriptive statistics of the variables*

	Selective Attention	SI Content	SI Presentation
N	72	72	72
Minimum	1.00	2.00	2.75
Maximum	10.00	8.75	10.00
Mean	8.17	6.55	7.81
Standard Deviation (SD)	1.79	1.31	1.28

Figures 2, 3, and 4 demonstrate distribution of selective attention, SI content and SI presentation respectively as compared to a normal distribution curve. As it can be seen in the histograms, data distribution

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for none of the three variables completely and impeccably overlaps with the normal distribution curve, so one cannot judge normality of data based on these figures alone. In order to calculate the extent of deviation of the data distribution from normal distribution, the one-sample Kolmogorov-Smirnov Test was used to investigate the normality hypothesis for the respective variables.

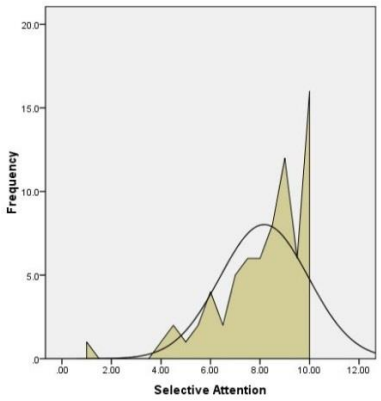


Figure 2. Selective attention distribution

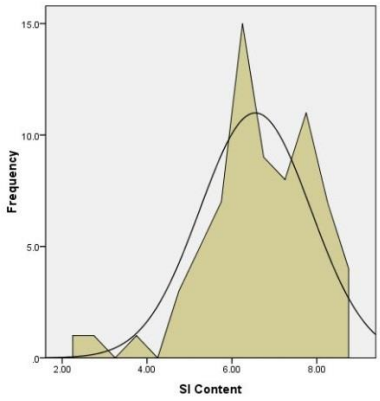


Figure 3. SI content distribution

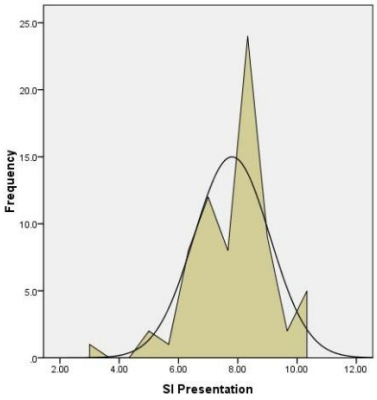


Figure 4. SI presentation distribution

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According to Table 2, significance level of the test was higher than 0.05 for all variables (0.06, 0.57, and 0.29 for selective attention, SI Content, and SI Presentation respectively). Thus, the independent variable and both dependent variables were normally distributed. As a result, parametric methods could be used to investigate both hypotheses of the research. Since the study was correlational, Pearson Correlation Coefficient was used to analyze the relationship between variables.

Table 2. *One-Sample Kolmogorov-Smirnov Test*

		Selective Attention	SI Content	SI Presentation
	N	72	72	72
Control	Kolmogorov-Smirnov Z	1.33	0.78	0.98
	Asymp. Sig. (2-tailed)	0.06	0.57	0.29

*. Correlation is significant at the 0.05 level (2-tailed).

In order to ensure inter-rater reliability of the SI task, first, Pearson correlation between the two raters was calculated using SPSS software. Then, a formula (Mackey & Gass, 2016, p. 388) based on the correlation of (agreement between) the two raters was used to measure the inter-rater reliability of the SI task. Table 3 summarizes the inter-rater reliability of the ratings. The findings showed a high inter-rater reliability index for the rating decisions by both raters.

Table 3. *Pearson correlation and inter-rater reliability index of SI task*

Task	Raters	Sig. (2-tailed)	Correlation Coefficient	Inter-Rater Reliability Index
SI Task	Rater 1 & Rater 2	.000	0.704**	0.826

**. Correlation is significant at the 0.01 level (2-tailed).

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Furthermore, to investigate reliability of the auditory selective attention task, Cronbach's Alpha coefficient of reliability was calculated using SPSS. Results of reliability analysis for the task are reported in Table 4.

Table 4. *Alpha reliability score for Selective Attention Task*

Task	No. of Items	Cronbach's Alpha
Selective Attention	8	0.717

4.2. Investigating the First Research Question

The first research question of the present study was concerned with existence of a relationship between selective attention and performance of BA students in SI in terms of content. The results of Pearson Correlation test were reported in Table 5:

Table 5. *Pearson Correlation for Selective Attention and SI Content*

		SI Content
Selective Attention	Pearson Correlation (*r*)	0.457*
	Sig. (2-tailed) (*p*)	.000
	N	72

*. Correlation is significant at the 0.05 level (2-tailed).

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As table 5 demonstrates, the Pearson correlation coefficient for selective attention and SI performance in terms of content was 0.457 which was a positive value, indicating the direct relationship between the two variables. Moreover, the significance level for the test was .000 which was lower than .05 (Sig= 0.000 > 0.05). Thus, with 95% confidence, a significant positive relationship could be assumed between selective attention and SI performance in terms of content. This meant BA student interpreters who had a better selective attention were likely to perform better in SI tasks in terms of the content of their interpretation. Thus, the first research question was answered.

4.3. Investigating the Second Research Question

The second research question of the study was concerned with existence of a significant relationship between selective attention and performance of BA students in SI in terms of presentation. The results of Pearson Correlation test were demonstrated in Table 6.

According to Table 6, the Pearson Correlation Coefficient between selective attention and performance of participants in SI in terms of presentation equaled 0.373 which was a positive value and indicated a direct relationship. Furthermore, the significance level was 0.001 which was lower than 0.05 (Sig= 0.001 < 0.05) and thus the correlation was significant.

Table 6. *Pearson Correlation for Selective Attention and SI Presentation*

		SI Presentation
Selective Attention	Pearson Correlation (*r*)	0.373*
	Sig. (2-tailed) (*p*)	.001
	N	72

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*. Correlation is significant at the 0.05 level (2-tailed).

Consequently, a significant positive relationship could be assumed between selective attention and SI performance in terms of presentation with 95% confidence. This suggested that the BA students who participated in this study and had better selective attention, performed better in SI tasks in terms of presentation.

4.4. Discussion

The results of the study indicated a significant positive association between the independent variable (selective attention) and both dependent variables (SI content and SI presentation) in the sample of the study. According to Dörnyei (2007) correlations as low as 0.3 to 0.5 are considered meaningful in applied linguistics. Therefore, the obtained correlations in this study were meaningful which meant both content and presentation of SI performance were likely to be better indicators in the performance of interpreter students with higher selective attention capacity. This relationship was stronger in case of content of SI performance. The reason might lie in the very definition of selective attention which is more concerned with attending to relevant channels of incoming information and less with the presentation of that information in the target channel.

The literature on interpreting has long assumed an important role for selective attention. Nevertheless, for the most part, this role has been taken for granted. Cowan (2000) discussed the implications of selective attention processing limits for interpreting and reported a study by Gerver (1974) which involved listening, shadowing, and interpreting a text from French into English and tested comprehension of the message in each situation as an indicator of the amount of attention required by the task and assumed that since interpreting required the most attention and effort, it would not allow adequate attention to be devoted to understanding the text. Gerver (1974) found that comprehension in listening situation was the highest (58%) and interpreting

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caused some level of distraction from meaning comprehension (51%), while shadowing led to the lowest percentage of comprehension (43%).

Moreover, research comparing SI to shadowing conducted to examine the core cognitive processes and factors focused on attention sharing, data management and retention (Darò & Fabbro 1994; Lambert 1989), along with the process of lateralization of languages in the brain (Green et al. 1990). Indubitably, most studies dealt with the shadowing of speech, and less frequently the shadowing of sentences or words (Darò 1989). The results of such studies proved that the SI task needs more cognitive demands such as selective attention and is more easily distracted than shadowing.

Considering the strength of claims regarding the importance of selective attention in interpreting, one might expect a stronger correlation between the two. One of the reasons for the relative low strength of the correlation might be the fact that many factors are at work in the process of interpreting and one factor in isolation does not play a decisive role. Another factor that might have affected the strength of the association in this study is the fact that due to Covid-19 pandemic the data collection procedure was carried out online which posed certain limitations and is likely to have affected the quality of the collected data.

Furthermore, it must be borne in mind that the literature on selective attention has pointed to the fact that measuring this cognitive faculty of human mind relies heavily on reports (verbal or otherwise) of the subjects and thus might not be completely objective; for example, the participant might have experienced lapses in attention and might have not completely attended to the target channel (Cowan, 2000; Cohen, 2006). Nevertheless, as far as the researcher has explored the literature on the subject, more reliable tools for measuring such cognitive properties have not been developed yet and Stroop tasks and dichotic listening tasks are the most common instruments for measuring visual and auditory selective attention, respectively; except for neuro-scientific studies which use special devices and monitor the physiological changes to measure the processes in the brain.

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It was stated earlier that in SI it is vital to control the attentional resources properly, that is, the interpreter must be able to recognize which parts of the stimuli and which stages of the process requires more attention and to avoid distraction by irrelevant distractors in the environment (Pöchhacker, 2013). The level of distraction in the interpreting situation reported in Gerver's research (see above) might be responsible for the lower mean value in SI content found in the present study (See Table 1), suggesting the inability to transfer content of the source material in the target language might stem from a lack of comprehension. Further studies in the field are needed to investigate the comprehension level in tasks of interpreting and analyze the results in relation to selective attention ratings to clarify which phase of the performance (e.g. comprehension or translation) is most affected by selective attention.

While a longitudinal study by Ghiselli's (2020) on two groups of translation and interpreting students over 19 months did not prove that interpreter training would enhance the cognitive abilities over time and she found no meaningful difference between the interpreting and translation students in her sample, we believe that the findings of the current study have implications for interpreter training. Clearly, the cause of the difficulties that students struggle with in interpreting courses is not merely linguistic. Once trainers acknowledge this fact and try to incorporate exercises that address selective attention in their training, they can help students take steps towards dealing with a likely cause of their problems.

The researchers contend that trainees might benefit from use of interpreting tasks that incorporate selective attention in the form of dichotic listening. Kornakov (2000) counts working on "the students' concentration and level of attention from the very beginning" (p.243) as one of his five principles for interpreter training and suggests use of exercises with extra sounds or extreme gesticulation as distractors. Camayd-Freixas (2011) also points to multitasking exercises for selective attention management as beneficial in interpreter training and suggests writing numbers from 1 to 100 and backwards while shadowing a piece as the first step in this type of

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exercise, with more difficult exercises involving writing the national anthem or some other poem while shadowing.

A more complex example of such a task might involve using practice materials that present two overlapping stimuli in the receptor channels and asking trainees to attend to only one channel and shadow or sight translate the attended channel while ignoring the other. This type of exercise might be useful in making trainees aware of the need to focus their attention on relevant input and preparing them for SI tasks (See, Bahri & Gholami, 2012; Phelan, 2001; Zhong, 2003). This type of preparation before moving to simultaneous tasks might be helpful in avoiding frustration on the part of trainees as a result of failure in SI tasks.

Implementation of such a method and its implications can be subject of future research in the field. Experimental studies involving the use of traditional methods in the control group and use of a method which incorporates selective attention into training in the experiment group can shed some light on feasibility and effectiveness of this type of method in improving interpreting performance in trainees.

While it is true that in practice implementation of such a method in classroom context would require special materials and expertise on the part of trainers and would probably create the need for more time to be allocated to interpreter training in the translation curricula in universities (See Bahri & Gholami, 2012; Kelly, 2005; Niska, 2005; Zhong, 2001), an evaluation of the quality of interpreting courses in the current university curriculum and their effectiveness in training interpreters capable of fulfilling the ever increasing demand for professional interpreters in the market might point to the necessity of expansion in the time and effort devoted to interpreter training so as to make more methodical training possible.

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5. Conclusion

The complexity of SI is not a secret in the field and acquiring such a skill is by no means an easy task for students. Not every student can become a professional interpreter and adequate linguistic resources are clearly not enough for developing interpreting competence. The reason lies in the fact that many non-linguistic faculties are at work in the process of SI in addition to the linguistic ones and managing the comprehension of input and delivery of interpretation requires use of a number of these faculties at each phase. Individual differences in each of these factors can contribute to success or failure in becoming an efficient interpreter.

Aside from linguistic factors such as structural differences between the source and target languages or speed of input and their effect on the performance of interpreters, researchers and theoreticians in the field have long been fascinated by the role of psychological factors and such cognitive faculties as attention and memory in the process of interpreting and have tried to account for their significance in managing the pressure imposed by simultaneity of the task on the interpreter. The present study was an attempt at shedding some light on the relationship between selective attention as a cognitive faculty and SI performance of interpreter students in order to contribute to the existing line of research and provide some tentative clues on how to help students overcome the difficulties that result from overwhelming flow of information in the process of SI on the one hand, and limitations of human cognitive resources on the other.

Positive significant correlations were found to exist between selective attention and content of SI as well as between selective attention and presentation of SI, although the association was stronger in case of the former. These findings led the researchers to claim that interpreting students with better selective attention were likely to perform better in interpreting tasks, especially in terms of the content of their performance which was concerned with completeness and accuracy of informational content of the interpreted message.

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This makes the findings more significant, because if we consider the management of content of interpreted message as the more problematic aspect of SI performance for student interpreters and then heed the stronger association between selective attention and this particular aspect, we can reach the conclusion that boosting selective attention can help overcome a great deal of difficulties of the SI process which are concerned with the content aspect.

The researchers did not investigate the research questions of the study in professional interpreters since it was assumed that only those who perform well in interpreting tasks were inclined to pursue careers in interpreting and the potential correlation between the variables of the study could be obscured by the fact that they were all professional (good) interpreters. Thus, the study was conducted with student interpreters as participants to ensure a variety of competence levels in the main task. However, the students themselves were not interpreting students as there are no interpreting programs at BA level in Iran. We suggest that future researchers conduct their studies with interpreting students to check the similarity or differences of our findings.

Finally, this study was carried out within the context of the Covid-19 pandemic. Direct access to the study participants was not possible and data was collected online with virtual cooperation of the subjects and their teachers. This could adversely affect the reliability of our study. Hence, we recommend that further research should be conducted before generalization of the findings.

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Appendix A

Transcription and tentative translation of simultaneous interpreting task stimuli for ease of rating by two raters.

Ladies and gentlemen, hello, my name is Hellen Campbell and I used to be a staff member of the Skik and I retired a few years ago. And here I am back to talk to you today. And my subject is going to be a very simple one: walking. And I'm going to start now.

Now, I'm just back from a holiday in Italy. I spent five days there touring around the hills outside Rome with eleven others in the group, all from France. We were there to visit gardens and visit castles and it was all very interesting. There were interesting stories, the histories of these castles and who owned them, popes and dukes and cardinals and princes of course; and many stories of murder and mayhem and skullduggery, corruption, and power struggles. I thought, well, not much has changed really in Italy, or anywhere else for that matter. But, yes, the gardens. The gardens - of course, being Italian- were of the geometric variety, very beautiful to see as well. And usually, the gardens were below the castle or the palace of the owner. The idea being – and we're talking here about the 16th century, most of the time – the idea being that the owner would be in the castle at the top and that there would be a beautiful view of these lovely gardens below and everyone would realize how influential and important the owner was, be a duke or a cardinal.

So, that meant we would go up and visit the palaces and the castles, and that meant walking, walking a great deal. Up many many stones, stairs and down again. Jolly tiring. Actually, we were averaging something like 8 to 10 kilometers every day, and the average age of the people in the group was mine, as you can see not terribly young. So, a lot of walking. And therefore, I was rather interested to read about a study done recently about exactly that: how people walk.

خانم‌ها و آقایان سلام. من هلن کمبل هستم. پیش از این از کارمندان اسکیک بودم و چند سال قبل بازنشسته شدم. و امروز به اینجا آمده‌ام که با شما صحبت کنم. موضوع صحبت من موضوع بسیار ساده‌ای است: پیاده روی. حالا شروع می‌کنم.

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من به تازگی از تعطیلات در ایتالیا برگشتم. من پنج روز در آنجا به گردش در اطراف تپه‌های رم به همراه یازده عضو دیگر گروه که همگی اهل فرانسه بودند گذراندم. ما برای بازدید از باغ‌ها و قلعه‌ها به آنجا رفته بودیم و همه چیز بسیار جالب بود. داستان‌های جالبی شنیدیم، تاریخچه‌ی این قلعه‌ها و کسانی که مالکشان بودند، پاپ‌ها و دوک‌ها و کاردینال‌ها و البته شاهزادگان، و داستان‌های بسیار از قتل و آشوب و توطئه، فساد و کشمکش قدرت. با خود گفتم چیزی در ایتالیا یا در واقع در هیچ‌جای دیگر عوض نشده. اما، بله، برگردیم به باغ‌ها. باغ‌ها به طبع ایتالیایی بودند، از نوع هندسی بودند و بسیار زیبا به نظر می‌رسیدند. معمولاً این باغ‌ها زیر قلعه یا کاخ مالک جای داشتند. به این مقصود که –در اینجا بیشتر مواقع از قرن شانزدهم صحبت می‌کنیم – به این مقصود که مالک در بالا در قلعه و نمای زیبایی از این باغ‌های دلفریب در پایین باشد و همه متوجه شوند که مالک چقدر صاحب نفوذ و مهم است، خواه دوک باشد خواه کاردینال.

این یعنی ما بالا می‌رفتیم و از قلعه‌ها و کاخ‌ها بازدید می‌کردیم و این به معنی پیاده‌روی بود، پیاده‌روی بسیار زیاد. بالا رفتن از صخره‌ها و پله‌های بسیار و دوباره پایین رفتن. بسیار خسته کننده بود. در واقع ما میانگین حدود 8 تا 10 کیلومتر در روز پیاده‌روی می‌کردیم و میانگین سنی اعضای گروه سن من بود که همانطور که می‌بینید چندان جوان نیست. پس زیاد پیاده‌روی کردیم. به همین دلیل من مشتاق شدم در مورد مطالعه‌ای که اخیراً در همین مورد انجام شده بود مطالعه کنم: افراد چگونه راه می‌روند؟

Appendix B

Rating Rubric for simultaneous interpreting task (for raters)

Simultaneous Interpreting Task

Dear …….

Thank you very much for your kind assistance.

Please rate your students' performance in this two-minute task in two categories: content and presentation. Content is concerned with source language material and presentation is concerned with delivery in the target language. Thus, please consider the following points while grading each student's performance of a total of 20 points:

Content (10 points):

1) omission of words with information content [-0.5 point each occurrence, e.g. tick (√) at most four instances, (-2) marks totally],

Please Tick (√) Maximum 4 Instances			
1)	2)	3)	4)

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2) omission of full sentence [-1 point each occurrence, e.g. tick (√) at most four instances, (-4) marks totally],

Please Tick (√) Maximum 4 Instances			
1)	2)	3)	4)

3) mismatch in information [-1 point each occurrence, e.g. tick (√) at most four instances, (-4) marks totally].

Please Tick (√)Maximum 4 Instances			
1)	2)	3)	4)

Presentation (10 points):

4) inappropriate choice of words and diction [-0.5 point each occurrence, e.g. tick (√) at most four instances, (-2) marks totally],

Please Tick (√) Maximum 4 Instances			
1)	2)	3)	4)

5) breach of target language style and sentence structure [-1 point each occurrence, e.g. tick (√) at most four instances, (-4) marks totally],

Please Tick (√) Maximum 4 Instances			
1)	2)	3)	4)

6) non-coherence of the message [-1 point each occurrence, e.g. tick (√) at most four instances, (-4) marks totally].

Please Tick (√) Maximum 4 Instances			
1)	2)	3)	4)

Kindly note that a transcription and a tentative translation is provided for ease of grading.

Many thanks again for your cooperation.

Appendix C

Instruction sheet and informed consent form for selective attention test (for participants).

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Instructions and Basic Information for Participants

Dear participant,

This task consists of 80 sentences in the form "Ready [Call sign], go to [Color] [Number]". There are eight call signs (Arrow, Baron, Charlie, Eagle, Hopper, Laker, Ringo, Tiger), four colors (White, Blue, Red, Green), and numbers (1, 2, 3, 4, 5, 6, 7, 8). You are assigned a specific call sign which you are to follow. Whenever you hear the assigned call sign, you should report the color and number which follows (e.g. if your call sign is 'Arrow', when you hear "Ready Arrow, Go to Blue 2" write down 'B2'). Each call sign is used 10 times in total and the order of sentences is random.

This task takes approximately 2 minutes to complete. It measures a cognitive ability called 'Auditory Selective Attention'. The results will be confidential.

Thank you very much in advance for your participation in the study.

Informed Consent: By ticking the box below, I consent to the terms and conditions of my participation in the study. □

Your call sign: **Arrow**

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

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