



Awareness Training for Interpreting Numbers: Insights from English-to-Persian Consecutive Interpreting

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Abstract

Numbers challenge interpreters as they are unpredictable, offer little contextual redundancy, and demand substantial processing. Research on numbers in interpreting has mainly focused on the simultaneous mode, leaving consecutive awareness training underexplored. This mixed-methods, quasi-experimental study examined how awareness training affected Iranian undergraduates' consecutive English-Persian number interpreting. Sixteen students formed experimental and control groups of eight. Training covered number-processing demands, English-Persian differences, common errors, note-taking, and practical exercises; pre- and posttests used 2020 US presidential debate excerpts. Paired-samples t-tests showed significant experimental-group improvements for numbers in context ($p = .043$) and with numerical modifiers ($p < .001$); the control group showed no significant change. Retrospective Interviews suggested better pronunciation, note-taking, performance, and confidence, though complex numbers and rapid sequences remained difficult. Training may improve number interpreting, but the small sample, non-random assignment, and baseline differences warrant caution; larger between-group studies are needed.

Keywords: Awareness training, consecutive interpreting, interpreter training, numerical accuracy, English–Persian interpreting

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1. Introduction

Numbers are among the most challenging elements in interpreting, particularly for trainee interpreters. As a type of problem trigger, numbers are associated with three characteristics that may account for the high frequency of errors in their interpretation, especially in the simultaneous mode (Simon, 2019). First, low predictability makes numbers difficult to anticipate, as they generally cannot be identified until the speaker utters them, thereby increasing listening and memory demands (Braun & Clarici, 1996; Mazza, 2001; Mead, 2015; Pinochi, 2009). Second, low redundancy means that numbers cannot easily be reconstructed from the surrounding context if they are missed or forgotten (Gile, 2009). Third, high information density increases processing demands, as interpreters must accurately perceive, retain, and reproduce numerical information alongside the rest of the message. This places additional demands on cognitive resources and may lead to cognitive overload (Alessandrini, 1990).

Frittella (2019a) believes that numbers are only one of many stumbling blocks that interpreting students may face with during the training courses; however, the potential for serious communicative errors which is inherent in misinterpretation of them should make numbers a priority in interpreter training programs. Therefore, one suggested possible solution to this problem could be doing training on numbers. Particular language-specific training can be designed to overcome this challenging feature. In much the same vein, some studies (Cheung, 2008, 2009; Her, 1995; Liu, 2005) appear to confirm the fact that receiving number training proves helpful for interpreters to interpret more accurately and to generally perform better when dealing with numbers in simultaneous interpreting. In line with the aforementioned studies, Shanmugalingam (2018) offers some pieces of advice on interpreting numbers during simultaneous interpreting, one of which is doing targeted training on numbers. Setton and Dawrant (2016) assert that numbers require targeted training which are especially beneficial in the case of misaligned numbering systems among the working languages of an interpreter. Nolan (2012) suggests various exercises which are aimed at addressing pitfalls of interpreting numbers. Also, the results of another study by Frittella (2019b) highlights the need for instructional designs and pedagogical responses to the challenge of interpreting numbers.

Earlier studies suggest that raising awareness is essential for learning the linguistic features of an L2 (Brewer, 1974; Dawson & Schell, 1987; Lewis & Anderson, 1985; Robinson et al., 2012; Rutherford & Smith, 1985; Venkatagiri & Levis, 2007). Moreover, drawing the learners' attention to the properties of L2 raises their awareness, hence making them aware of their own problems in learning; therefore, awareness training is a significant factor which is conducive to second language learning. Also, in their study, Yenkimaleki and Van Heuven (2016) have successfully applied awareness training, focusing on prosody, in the context of interpreting. Building upon these arguments, the present research came up with the idea of applying awareness training on numbers to the context of consecutive interpreting and aimed to investigate its effectiveness on performance of Iranian students. Although number processing in simultaneous interpreting (SI) and consecutive interpreting (CI) may differ substantially, we did not mean to put number processing in SI on a par with CI. However, investigating the impact of training on performance of consecutive interpreting was the main focus of this paper.

According to Mead (2015), despite the identification of numbers as a problem trigger for the interpreter, there has been relatively scant systematic investigation of this topic. Nevertheless, the subject has generated an eye-catching line of experimental research, showing that numbers and their context are rendered with limited accuracy, mostly in simultaneous interpreting. Overall, the focus of interpreting studies on numbers has been prevalently on the simultaneous mode, but the consecutive mode has been neglected. Also, no study on numbers, neither in consecutive nor simultaneous mode has been reported in the Iranian context. Therefore, this research attempted to propose a possible

solution to the problem posed by, in this case, consecutive interpretation of numbers and resolve this problem in a given Iranian context. In fact, the solution was doing awareness training on numbers particularly designed for and tailored to a group of Iranian BA students of English-Persian Translation and Interpreting. The objectives of this quasi-experimental study were to investigate the potential effects of awareness training on students' performance in consecutive interpreting of numbers from English into Persian and to explore their perceptions of the training's usefulness in improving their performance. More specifically, the study addresses two research questions:

1. Does intensive awareness training have a statistically significant effect on Iranian BA students majoring in Translation and Interpreting's performance in consecutive interpreting of numbers from English into Persian?
2. How do Iranian BA students majoring in Translation and Interpreting perceive the usefulness of intensive awareness training in improving their performance in consecutive interpreting of numbers from English into Persian?

2. Methodology

This study adopted a mixed-methods approach, combining a quasi-experimental design with a qualitative component to investigate the potential effects of awareness training on students' performance in consecutive interpreting of numbers from English into Persian and to explore their perceptions of the training's usefulness.

The participants were 16 Iranian senior undergraduate students majoring in English–Persian Translation at the University of Isfahan during the 2020–2021 academic year. All were native speakers of Persian, studied English as a foreign language, and were enrolled in a two-credit consecutive interpreting course. Convenience sampling was used to recruit participants, who were considered relatively homogeneous in terms of their advanced English proficiency and the number of translation and interpreting courses they had completed. The students were divided into an experimental group and a control group, each comprising eight participants. Group assignment was non-random and based on pretest performance: students with lower scores were assigned to the experimental group, while those with higher scores were assigned to the control group.

The intervention consisted of a researcher-developed, narrated PowerPoint presentation containing 57 slides, designed to raise students' awareness of the challenges involved in interpreting numbers. The training covered five areas: theoretical perspectives on the difficulty of interpreting numbers, drawing on the relevant literature; a contrastive analysis of English and Persian numbers, ranging from tens to trillions, with particular attention to similarities, differences, and pronunciation; a taxonomy of number-interpreting errors proposed by Frittella (2019a); practical reminders and strategies for taking notes on numbers; and three exercises in interpreting numbers from English into Persian, adapted from Nolan (2012), modified, and recorded by a native speaker.

Participants' interpreting performance was measured through two pretests and two posttests using short audiovisual excerpts containing numerous numerical references from the 2020 US presidential debates. The two pretests were selected from the second presidential debate, while the two posttests were taken from the first presidential debate. Table 1 presents the specifications of the four excerpts, including their duration, speakers, subject matter, frequency of numerical references, and interpreting instructions.

Table 1. Specifications of the Pretests and Posttests

Name of the Excerpt	Duration	Speaker(s)	Subject	Frequency of Numbers	Instruction For Consecutive Interpreting
Test 1 (Pretest 1)	00:51 min	Joe Biden	Coronavirus mortality rate in the USA	5	Interpreting the whole excerpt
Test 2 (Pretest 2)	1:38 min	Joe Biden & Donald Trump	Biden's plans for the economy and climate change	10	Interpreting only the numbers plus their numerical modifiers
Test 3 (Posttest 1)	1:27 min	Chris Wallace & Joe Biden	COVID-19 in the USA	13	Interpreting the whole excerpt
Test 4 (Posttest 2)	1:47 min	Donald Trump, Chris Wallace & Joe Biden	Biden's economic plans	14	Interpreting only the numbers plus their numerical modifiers

The scoring criteria differed between the two types of tests. In Tests 1 and 3, participants were instructed to interpret the entire excerpt, but their scores were based exclusively on the accuracy of the numbers rendered in Persian, irrespective of their interpretation of the remaining speech. In Tests 2 and 4, participants were asked to interpret only the numbers and their numerical modifiers. In this study, a numerical modifier referred to a word or group of words immediately following a number and forming part of the same numerical information unit, as in 6,500 dollars, 47 months, and 28 percent. Two exceptions occurred in Test 4: number 1 and number 2 were treated as numbers with their modifiers, although the modifier preceded the number. Three additional exceptions involved proper nouns containing numbers: AOC plus 3, COVID-19, and Fortune 500. The first and third were classified as numbers with numerical modifiers, whereas COVID-19 was classified as a number word in context. Each correctly interpreted number in Tests 1 and 3 was awarded 10 points; the same scoring value was assigned to each correctly interpreted number-plus-modifier unit in Tests 2 and 4.

Two instruments were used to collect data: consecutive interpreting tests and a retrospective interview. The tests were used to measure participants' performance before and after the intervention. The retrospective interview, conducted in Persian, was designed to explore the experimental group's perceptions of the training. It comprised three open-ended questions concerning participants' overall performance in the posttests, the perceived effectiveness of each section of the training presentation in improving their performance, and any additional comments about interpreting numbers.

Due to the COVID-19 pandemic, data were collected remotely through the University of Isfahan's Learning Management System and email. The procedure consisted of six stages. First, on 11 October 2020, participants received detailed instructions for completing the two pretests. The audiovisual files were uploaded to Google Drive and could be played only once; downloading was restricted to prevent participants from viewing the excerpts repeatedly. Before listening to each excerpt, students were informed of its duration, general subject, and speakers. They listened to each excerpt without pauses, took notes as needed, and consecutively interpreted the content into Persian within the allotted time. They then submitted a single audio file containing their interpretations, together with a photograph of their notes, by email.

Second, on 19 October 2020, the researchers evaluated the pretest performances and assigned participants to the experimental and control groups according to their scores. Third, on 23 November 2020, the control group completed the two posttests following the same procedure as in the pretests.

During this stage, the experimental group was absent, and access to the audiovisual files was restricted to reduce the possibility of the materials being shared between the groups.

Fourth, on the same day, the experimental group participated in a 90-minute awareness-training session. Participants were given the opportunity to ask questions and seek clarification, and feedback was provided to address any uncertainties. The training presentation was also sent to them by email, allowing one week for self-study, completion of the exercises, and additional independent practice. Self-study was considered an integral part of the intervention. Fifth, on 30 November 2020, the experimental group completed the same two posttests as the control group under the same testing conditions. Finally, on the same day, members of the experimental group participated in the retrospective interview. They recorded their responses in Persian and submitted them as a single audio file by email.

To answer the first research question, pretest and posttest scores were analyzed separately for each group using paired-samples t-tests in SPSS version 26. This analysis was intended to determine whether participants' interpreting performance changed significantly following the intervention. To address the second research question, the experimental group's retrospective interview responses were analyzed thematically to identify participants' perceptions of the usefulness of the awareness training in improving their consecutive interpreting of numbers from English into Persian.

3. Results and Discussion

This section presents and discusses the findings of the study, drawing on quantitative performance scores and qualitative data from retrospective interviews. The quantitative analysis examines changes in participants' performance in consecutive interpreting of numbers from English into Persian, comparing the experimental and control groups across pre-tests and post-tests. The qualitative analysis explores participants' perceptions of the awareness-training intervention, focusing on the strategies they acquired, the difficulties they experienced, and their assessments of changes in their interpreting performance. Considered together, these findings provide insight into the potential contribution of targeted awareness training to the development of numerical competence in consecutive interpreting.

3.1. Quantitative Findings: Effects of Awareness Training on Numerical Interpreting Performance

Figures 1 and 2 present the performance scores of the control and experimental groups, respectively, across the four tests. To examine changes in performance, paired-samples t-tests were conducted separately for each group, comparing pre-test and post-test scores for two task types: interpreting numbers in context and interpreting numbers with their numerical modifiers.

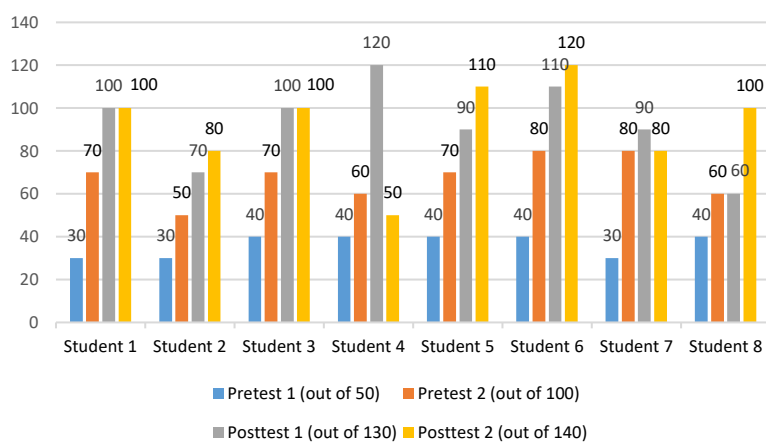


Figure 1. The Control Group's Performance Scores

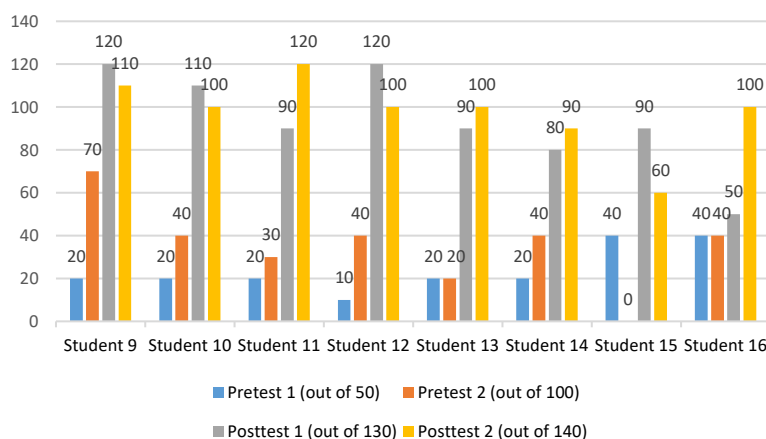


Figure 2. The Experimental Group's Performance Scores

3.1.1. Interpreting Numbers in Context

Table 2 presents the descriptive statistics and paired-samples t-test results for interpreting numbers in context. The experimental group's mean score increased from 45.00 (SD = 17.728) in Pre-test 1 to 72.93 (SD = 16.206) in Post-test 1. This improvement was statistically significant ($p = .043$). By contrast, the control group's mean score decreased from 75.00 (SD = 9.258) to 71.15 (SD = 15.247), and the difference was not statistically significant ($p = .515$).

Table 2. Descriptive Statistics and Paired-Samples t-Test Results for Interpreting Numbers in Context

Group			N	M	SD	SEM	Sig
Control	Pair 1	Pretest 1	8	75.00	9.258	3.273	.515
		Posttest 1	8	71.15	15.247	5.390	
Experimental	Pair 1	Pretest 1	8	45.00	17.728	6.268	*.043
		Posttest 1	8	72.93	16.206	5.730	

Note. * indicates $p < .05$.

3.1.2. Interpreting Numbers with Numerical Modifiers

As shown in Table 3, the experimental group's mean score for interpreting numbers with numerical modifiers increased from 35.00 (SD = 20.000) in Pre-test 2 to 69.64 (SD = 12.518) in Post-test 2. The difference was statistically significant ($p < .001$). The control group, however, showed little change, with a mean score of 67.50 (SD = 10.351) in Pre-test 2 and 66.07 (SD = 15.626) in Post-test 2; this difference was not statistically significant ($p = .782$).

Table 3. Descriptive Statistics and Paired-Samples t-Test Results for Interpreting Numbers with Numerical Modifiers

Group			N	M	SD	SEM	Sig
Control	Pair 1	Pretest 2	8	67.50	10.351	3.660	.782
		Posttest 2	8	66.07	15.626	5.525	
Experimental	Pair 1	Pretest 2	8	35.00	20.000	7.071	*.000
		Posttest 2	8	69.64	12.518	4.426	

Note. * indicates $p < .05$.

Taken together, the results show statistically significant pre-test-to-post-test improvements in the experimental group under both test conditions, whereas no statistically significant changes were observed in the control group. These findings suggest that the awareness-training intervention may have contributed to improved performance in consecutive interpreting of numbers from English into Persian. They are broadly consistent with Her (1995), Liu (2005), and Cheung (2008), who reported benefits of number training for simultaneous interpreting. Although those studies examined a different mode of interpreting, they provide relevant support for the potential value of targeted training in handling numerical information. The findings should nevertheless be interpreted cautiously: the groups differed in their baseline scores, and separate within-group tests do not establish whether the change in the experimental group was significantly greater than the change in the control group.

3.2. Qualitative Findings: Participants' Reflections on Awareness Training

The thematic analysis of the retrospective interviews identified four recurring themes: (1) pronunciation of numbers, (2) abbreviation and note-taking strategies, (3) perceived improvements in interpreting performance, and (4) persistent difficulties in interpreting numbers. The themes capture participants' views of the practical usefulness of the training and the challenges they continued to experience.

3.2.1. Pronunciation and Oral Production of Numbers

Several participants reported that, before the intervention, they had difficulty reading or pronouncing certain English numbers, particularly large numbers and numerical expressions that differed from Persian conventions. These difficulties may complicate the processing and accurate oral reproduction of numerical information. After studying the training materials, participants reported greater familiarity with number pronunciation and with differences between English and Persian. The following comments illustrate these perceptions:

A) "Personally, I didn't know how to pronounce some English numbers and when I studied the training file, I learnt their correct pronunciation."

B) "The training file was really useful for me because I didn't know how to say or read English numbers, particularly large numbers. The comparison of English and Persian numbers in terms of pronunciation, for example decimals, was very helpful."

C) “The training helped me greatly, not only in interpretation of numbers but also in pronunciation of numbers. I had enormous difficulty in saying large English numbers, but when I studied the file, the problem was alleviated. I made progress both in pronouncing and subsequently in interpreting numbers.”

3.2.2. Abbreviation and Note-Taking Strategies

Participants also described learning abbreviations and numerical symbols that they could use to record information more efficiently. Their comments suggest that the strategies introduced in the training helped them take notes more quickly and retrieve numerical information more readily during interpretation:

D) “The effects of the file were noticeable, particularly in writing and note-taking of numbers, especially large numbers like million and in abbreviating them. Also, in comparison with tests 1 and 2, my speed of note-taking numbers increased and I could better read from my notes and better interpret them. In brief, the training helped me a lot in note-taking and interpreting numbers.”

E) “Regarding my performance in tests 3 and 4, I would say that I used the numeric symbols suggested in the file, for example ‘Tr’ for ‘Trillion’ and ‘Bn’ for ‘Billion’. I think it made me take notes faster. Also, the training file was very comprehensive.”

F) “When I studied the file, I learnt and utilized some ways of note-taking for numbers and they made my interpreting so much easier and faster.”

3.2.3. Perceived Improvements in Performance and Confidence

Participants generally evaluated the training positively and associated it with improvements in their performance and confidence when interpreting numbers. The following comments illustrate their perceptions:

G) “The file helped me a lot to have a better performance in tests 3 and 4 than in tests 1 and 2. Also, it helped me with boosting my self-confidence while interpreting.”

H) “Altogether, the file had a great impact and made me feel more comfortable with interpreting numbers. I had a clear aim while interpreting numbers and I wasn’t confused.”

These responses are consistent with the findings reported by Frittella (2019a), whose study found that nine participants reported improvements in their ability to interpret numbers following a training program. This convergence suggests that targeted instruction may be a useful component of interpreter training. However, the present interview data reflect participants’ perceptions and should not be treated, in themselves, as independent evidence of objectively measured improvement.

3.2.4. Persistent Difficulties and the Need for Continued Practice

Despite the generally positive feedback, two participants reported that numerical interpreting remained challenging after the intervention. Their comments point to continuing difficulties with large or complex numbers and with sequences containing several numbers in close succession. They also suggest that further practice may be needed to consolidate the strategies introduced during training:

I) "Of course I have still some difficulties, for example some numbers are larger and more complicated or I may lose a number while interpreting it. However, I can feel the progress I have made in interpretation of numbers and I hope I will improve it with more practice."

J) "I didn't think interpreting numbers would be that much difficult, but finally I realized that. Definitely, the training file helped me to have a better performance, but interpreting numbers is still difficult for me; especially, when speakers use too many numbers in a row in their sentences, it will be very difficult for me to understand the rest of their utterances and I may misinterpret them. Therefore, I should certainly practice much more."

These comments indicate that a single training intervention may not fully address every trainee's difficulty with numerical information. The challenges described by participants may vary according to individual needs and may be particularly pronounced when several numbers occur within a longer utterance, requiring interpreters to retain numerical details while continuing to process the surrounding message. Repeated practice with varied numerical expressions, longer sequences, and interpreting tasks may help trainees consolidate their skills. Encouraging independent practice may also enable students to identify recurring problems and develop strategies suited to their own needs. Overall, the findings suggest that numerical competence develops through continued practice rather than through a single training session.

Overall, the quantitative results and interview findings offer complementary evidence regarding the potential value of awareness training. The experimental group's significant gains under both test conditions are accompanied by participants' reports of improved pronunciation, more efficient note-taking, and greater confidence. At the same time, the continuing difficulties reported by some participants suggest that training may need to be reinforced through sustained practice. These conclusions should be considered in light of the small sample and the groups' different baseline scores. A direct comparison of change scores or a group-by-time analysis would be needed to establish more firmly whether the intervention produced a greater improvement than that observed in the control group.

4. Conclusion

This quasi-experimental research was among the pioneering attempts to address the difficulty of interpreting numbers in consecutive mode. It attempted to fill the lacuna by proposing an awareness-raising training program specifically designed to resolve this number-related problem in a particular Iranian context. The results of paired samples t-tests and within-group analysis suggested that the improvement was statistically significant for the experimental group both in consecutive interpretation of numbers in context ($p = .043$) and numbers plus their numerical modifiers ($p = .000$), which was indicative of the positive effect of awareness training on improving their performance. Also, the qualitative thematic analysis of the retrospective interview suggested that students perceived the training as useful, helpful and effective for coping with the difficulty of numbers in consecutive interpreting from English to Persian.

The main limitation of the paper lies in its small number of participants which can be originally attributed to the lockdown imposed by COVID-19 in the time of data collection. Since conducting this research coincided with the Coronavirus pandemic and the temporary closure of universities, it was impossible to physically meet the participants. Therefore, the main access to the participants was via the distance learning online classes held in the LMS (Learning Management System) platform of University of Isfahan. The supplementary access to them was via their emails. It goes without saying that generalization was not among the main objectives of the present study. Strong generalization calls for further investigations with more participants. However, the application of number training proved

to be effective in enhancing the students' performance in consecutive interpretation of numbers from English to Persian.

Irrespective of the limitations of the present study, it is hoped that the present study will contribute to the field of Interpreting Studies by providing valuable insights into the difficulty of numbers in consecutive interpretation from English to Persian. Eventually it was an attempt to resolve this problem by proposing intensive awareness training plan aiming at increasing attentiveness, responsiveness and sensitivity of students to numbers, thereby enhancing their awareness towards numbers and helping them cope with the pitfalls of interpreting numbers in the consecutive mode. In fact, the proposed training may serve as an instructional plan, addressing the problem of interpreting numbers in consecutive interpreting and sensitizing both interpreting trainers and students to the significance and difficulty of numbers in consecutive interpretation.

Therefore, the two-way awareness is important for both interpreting trainers and trainees. On the one hand, if trainers attach importance to numbers, attempt to design specific awareness training plans and teach them to deal with numbers, then students' needs may be satisfied and they may be better prepared for their future professional career, especially when dealing with problematic numbers in the course of interpreting. On the other hand, if students and trainees become fully aware of the difficulty of numbers, take notice of them, take them seriously, prepare themselves mentally, and practice much more for numbers, then chances are they may respond faster and automatically to numbers, cope with this difficulty and interpret them successfully. As Cheung (2009) suggests that the implementation of training methods is intended to help learners acquire the skills and knowledge to respond accurately and promptly to numbers in the source language, hence reducing the potential risk of mental overload. It can be concluded that there is a need for transforming this problem trigger into a trigger in the mind to shoot the fast and correct interpretation of numbers from the mouth of the interpreter into the ears of the target audience.

This research may open a new turning point for future researchers. Firstly, prospective researchers may replicate this quasi-experimental study in their own contexts possibly with a larger sample size. Also, since investigating the difficulty of numbers in consecutive mode has not received adequate attention, it might be worthwhile and interesting to investigate it in other language pairs. In addition, aside from consecutive interpreting, it is also recommendable to explore the difficulty of numbers in sight translation, which could possibly give different results. Finally, future studies can also focus on the potential effect of gender differences on the performance of male and female participants in interpretation of numbers in various settings of interpreting.

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