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THE IMPACT OF FATIGUE ON NEGATIVE INTERFERENCE IN SIMULTANEOUS INTERPRETING

Summary. This paper aims to analyze the role of fatigue in negative language interference in simultaneous interpreting (SI). It is undeniable that excessive fatigue has a direct impact on interpreters since it impairs their capacity to concentrate, use short-term memory, and regulate their emotions. Consequently, this results in information loss and further errors. According to the aforementioned theories, including Gile's Effort Model, Green's Inhibitory Control Model, and Baddeley's model of reconstructive memory, the main topic of discussion will be how fatigue exacerbates interference with language meaning retrieval on all four levels: lexical, syntactic, phonological, and even pragmatic. Twenty master's degree students participated in an English-Ukrainian interpreting experiment that showed these effects. Participants translated political speeches from English to Ukrainian when fatigue was a modifiable factor. The study found that fatigue was actually correlated with the rise in more harmful interferences, such as overly literal translation, oversyllabic locus, and overpragmatics. In linguistics, improper cognates and sentences with disordered structure were more common in the more exhausted sessions. Additionally, the amount of information lost through interpretations increased with fatigue, which further impacted the quality of the interpreting.

Fatigue-maintenance strategies were used to address these issues in the last stage of the experiment. The knowledge was better retained and interference errors were reduced by the use of error-analytic training, mindfulness exercises, and the scheduling of suitable rest periods [1, c. 187]. These findings emphasize how crucial it is to consider resilience characteristics in the framework of interpreting training programs.

In addition to offering a setting for a thorough discussion of prospective long-term tactics, technology use, and training, this study highlights the dynamics of cognitive fatigue in the context of detrimental influence. In addition to offering insights on how to enhance interpreters' performance in difficult circumstances, this study advances theoretical knowledge and practical experience in relation to SI performance. The results have implications for cognitive linguistics in general as well as educational professional contexts.

Key words: cognitive interpreting studies, simultaneous interpreting, fatigue training, cognitive flexibility, language interference.

Introduction. Simultaneous interpreting (SI) is a very complex cognitive process where the translator must actively listen to, understand, and replicate spoken language simultaneously. This necessitates the use and integration of several processes, including language processing, working memory, and attention. Due to the intense nature of SI, it is susceptible to several cognitive obstacles, including fatigue, which directly affects the quality of the performance output.

Fatigue has proven to be a factor which hinders effective translation. Mao points out the reason that with fatigue comes physical and mental tiredness which affects performance and in most cases does not spare cognitive functions, the basic requirements for undertaking translation work [2, c. 11].

Fatigue exacerbates negative interference in SI, which is the distortion of the source language in the target language that lowers the translator's quality and overall interpreting in accuracy.

In recent years, a lot of attention has been paid to the cognitive processes that occur in the mind during the process of translating and interpreting. Li and He assert that a number of processes, including working memory, attention, and language processing, are necessary for active involvement and their integration [3, c. 28].

Cognitive fatigue may impact language processing when interpreting, as demonstrated by Hatzidaki and Pothos, who examined bilingual language representation and the processes of cognition under concentrated attention [4, c. 225].

However, there is still a great deal to learn about how fatigue causes interference in SI, especially in light of the Ukrainian context.

Understanding this link is crucial because it may help build training programs and professional development activities that will help interpreters manage how fatigue affects their ability to execute their jobs.

This research investigates cognitive fatigue as the perceived detrimental interference in simultaneous interpreting for master's students in order to close this gap. To help frame policies to better improve interpreters' performance and ability to function in sub-optimal situations, this research aims to provide information on sub-optimal conditions, specifically how fatigue affects optimal error ratios and interference ratios.

Since the focus of this study is on negative events produced by fatigue that fundamentally degrade SI performance, it generally aims to offer new concepts that might improve our knowledge of interpreting and language processing. In order to improve the overall quality of SI services provided, the findings are anticipated to give several recommendations on interpreting education, professional ethics, and quality standards.

Research Aim. The specific focus of this study is cognitive fatigue and how it affects simultaneous interpreting (SI) across the language's many contact zones, such as the phases of coordination, communication, and regulation. The study aims to ascertain the degree to which fatigue affects the quality, accuracy, and efficiency of SI with respect to language processing and inter-

ference, taking into account that fatigue is one of the main cognitive obstacles.

Research Goals

1. Exploring fatigue as a cognitive process: To explore how working hours of task-related activity impact the cognitive processes for interpreters such as attention, memory, and executive control, all necessary for performing SI effectively.

2. Exploring the modalities of the negative interference: To analyze the forms of errors and language interference occurring as a result of cognitive fatigue during the time the person performs simultaneous interpreting.

3. Exploring the relative effects of fatigue on performance: To establish the relationship between fatigue prevalence and decrease in the ability to generate clear, precise and high quality output when doing simultaneous interpreting.

4. To conduct a study with the MA students: Investigate empirically how translation students behave when recording with fragmented attention while simulating the interpreting of several languages. To subsequently record the amount of interference and any mistakes committed, the recording meant for this experiment will describe steadily growing fatigue conditions.

5. To outline the ways to reduce fatigue: Use the research outcomes to suggest reasonable methods to mitigate that fatigue in interpreting situations and enhance interpreters' adaptation to challenging circumstances.

Theoretical Framework. The theoretical underpinning of cognitive processes in simultaneous interpreting (SI) is presented in this research, with a focus on how tiredness affects negative interference. The expertise of Ukrainian and international academics enhances this framework, which is crucial for advancing our knowledge of cognitive processes.

Cognitive Load Theory in Interpreting

The theory of cognitive load (CLT) suggests that there is a limit to how much information the human cognitive system can process. In the case of SI, interpreters are to cope with intrinsic cognitive load (complexity that is part of the task) as well as extraneous cognitive load (additional requirements like noise). The Ukrainian scholar, Olha Ivanova argues that excessive cognitive load saps the interpreter of his or her mental resources and compromises the quality of their cognitive tasks performance [5, c. 110].

Working Memory and Executive Control

The concept of working memory is a very important factor in SI since it allows the interpreters to hold and manipulate information for a short period of time. The working memory model by Baddeley and Hitch central executive, phonological, visuospatial sketchpad offers a broad perspective to these processes [6, c. 239]. The focus of Ukrainian researcher Petro Petrenko was the link between the working memory capacity and even professional interpreters' performance accuracy, reporting that performing interpreters possessed a larger volume of active working memory [7, c. 32; 8, c. 121].

Automaticity and Controlled Processing

The moderation of the scope of automaticity in relation to controlled processing is an important aspect of SI. Schneider and Shiffrin advanced a dual-process theory of cognitive load in which automatic processes are said to be rapid and involuntary opposed to controlled processes which are slow and involve mental effort. In interpreting, simple tasks may be performed automatically, while more difficult tasks that require attention and focus on novel or complex information would be controlled [9, c. 29].

Ukrainian scholar Iryna Kovalenko looked at interpreters as the performers who reach their automaticity through a constant practice improving their efficiency and their overall cognitive load.

Impact of Fatigue on Cognitive Functions. Fatigue has a negative impact on the cognitive functions that are essential for SI such as attention, memory and executive control. The research of Ukrainian psychologist Svitlana Melnyk has concluded that cognitive fatigue decreases the level of functioning and increases the capacity level of noise. At the same time, some international studies have shown that fatigue does affect the level of interpreting and negatively affects the performance level and the rate of errors [10, c. 10].

Negative Interference in Bilingual Processing. Negative interference occurs when elements of the source language improperly influence the target language output. According to Green, it has been proposed that the bilingual control of language production must also have an element of inhibition to avoid interferences [11, c. 72; 12, c. 72]. Mykola Shevchenko – a Ukrainian linguist has examined how fatigue owing to the need for exerting greater inhibitory control creates more negative interference in interpreting tasks [13, c. 96].

Methods. To meet the research objectives, this study follows a mixed-methods strategy in which both qualitative and quantitative analysis techniques are integrated. The main objective is to determine the effect of fatigue on the negative interference experienced during simultaneous interpreting.

The participants engaged in the study were master's students at Taras Shevchenko National University of Kyiv in the Department of Translation and Interpreting. They were bilingual speakers (Ukrainian-English) aged between 20 to 22, and had B2 to C2 level of proficiency in the English language. These students were selected as they had already been well trained in SI, and had some basic knowledge of interpreting, thus all the group members had a similar level of relevant baseline interpreting skills.

Experiment Design

The study lasted over a period of two weeks with interpreting sessions conducted under various conditions for varying times to create artificial cognitive fatigue:

Condition A (Low Fatigue): Interpreting sessions of 30 minutes each with a 10 minutes interval between the two sessions.

Condition B (High Fatigue): Interpreting sessions for 2 hours with a 10 minutes break after every hour of interpreting.

All the interpreters had to interpret the same speeches of the same complexity, but with different cultural and contextual aspects, to increase the chances of interference. The texts contained speeches with idioms, language used in its specialized area as well as grammar and syntax patterns that were peculiar to the source language.

Results and Discussion

Objective 1: Analyze fatigue as cognitive impediment

Indeed, it was substantiated that the level of fatigue increases when interpreters are engaged for a longer time and provided with no breaks at all. These outcomes corroborate Melnyk's evidence indicating that decision making and focus are worse in people suffering from cognitive fatigue [10, c. 90].

Objective 2: Identify Manifestations of Negative Interference

Condition B had significantly higher instances of Negative Interference than other conditions. Syntactic (e.g., direct transfer of source language structure) and lexical interference (e.g., false cognates) were the most common. The findings support Green Inhibitory Control Theory due to the supposition that fatigue also affects interpreters' control over the language processes that are not needed for the task at hand [11, c. 74].

Objective 3: Evaluate the Relationship Between Fatigue and Performance

As quantitative analysis revealed, there was a statistically significant decrease in the accuracy and fluency rate under high-fatigue conditions. This is in line with Ivanova's observations that while working with high cognitive load a person becomes more prone to making mistakes.

Objective 4: Conduct an Experiment with Master's Students

The structured experimental approach provided empirical evidence of the role of fatigue in negative interference and why there is the need to have an interpreters training that focuses on their cognitive resilience.

This study shows that fatigue ought to be considered as a significant cognitive barrier in SI as it greatly multiplies the negative interference. The suggestions emphasize the need to control cognitive load and the strategies aimed at the reduction of fatigue in the interpreters' training programs.

The Relationship Between Fatigue and Cognitive Factors During Simultaneous Interpreting

Fatigue is a unique, intricate cognitive concept that shows up as a loss of mental and physical resources essential to executive processes, working memory, attention, and mental control. Fatigue has a substantial impact on interpreting, especially when it comes to simultaneous interpreting (SI), which involves the mental strain of simultaneously speaking and understanding a foreign language in a setting. By evaluating various degrees of explanation within the conceptual framework, the link between fatigue levels and negative language interference may be clarified.

Implications for Simultaneous Interpreting. Going after the hypothesis that fatigue is the negative language interference paves the way for establishing specific measures in interpreter's education and practice. In our opinion, the combined use of cognitive resilience strategies with mindfulness or strict time schedules for rest breaks should reduce the influence of fatigue on interpreting efficacy. Along with that, techniques aiming at improvement of inhibition control and working memory are likely to decrease the interference under fatigue conditions.

It comes out from this analysis that there is a complex interplay between the factors of fatigue and cognitive operations in SI and this composition is relevant for both theoretical and practical purposes. Next, future quantitative research could demonstrate accuracy towards these concepts and improve understanding of fatigue in relation to various dynamics of the interpreting process.

Experiment. The participants were asked to interpret political lectures from English into Ukrainian dealing with fostering fatigue. The aim was seeing the levels of negative interference on different layers of language and how much information was lost through fatigue.

As mentioned earlier, a series of experiments were carried out in three phases:

1. Phase 1: Performance measurement of participants at the baseline phase: The participants actively translated political lectures that ranged from 10-15 minutes and had adequate breaks between them to prevent minor fatigue. This period has set benchmark levels of performance.

2. Phase 2: Fatigue Inducing Sessions. Participants took longer speeches with a 5 minute break after each session. These sessions were supposed to bring both physical and cognitive fatigue. The speeches consist of linguistically loaded connotations evoking metaphors, digressions of expressions and twisted sentences.

3. Phase 3: Adapting and Addressing. Apart from the cognitive exercises, mindfulness tasks , enhanced break scheduling were also suggested as fatigue strategies. The process of interpreting the similar tasks was repeated with the aim of checking if there was any outcome.

Fatigue augmented enhancement of negative interference at various linguistic levels. Some of these effects may be illustrated with examples from the fatigue inducing sessions as follows:

1. Lexical-Semantic Interference:

Example 1 "The government is prepared to address these pressing issues."

"Уряд готовий адресувати ці нагальні питання."

The term 'to address' translating into 'адресувати' leads to semantic interference since it is not appropriate to say this in a situation where one should say 'вирішувати' or 'займатися'.

Example 2" She was instrumental in the success of the project".

"Вона була інструментальною у досягненні успіху проекту."

"Вона відіграла ключову роль у досягненні успіху проекту."

As a representation, the term "Instrumental" was somewhat deviated from its actual intended meaning as a key word or figuratively. Such situations depict the way exhaustion is able to affect the appropriate word choice within a given context. Let us look at example three which states: "The report was highly critical of the new policy".

3. Syntactic Interference.

"The resolution... passed unanimously… reinforces our devotion to peace."

"Резолюція, прийнята одностайно, підкреслює наше зобов'язання до миру".

"Until peace" is translated literally to "to peace" therefore using it sounds unnatural in Ukraine or in other languages but one so "обов'язання щодо миру" works.

3. Phonological Interference:

English: "Globalization challenges our sovereignty."

"Глобалізація челенджить нашу суверенність".

The English word "challenge" was phonetically borrowed instead of using the Ukrainian equivalent "ставить під сумнів".

4. Pragmatic Interference:

English: "We have to pull ourselves up by our bootstraps".

"Ми маємо підняти себе за власні шнурки".

Instead of searching for a suitable idiomatic expression "ми маємо вирішити це власними силами", a literal translation of the idiom was done.

Loss Data analysis revealed a strong correlation between the two factors in that as the level of fatigue increased both interference and information loss increased as well.

Lexical and syntactic interference predominated with fatigue and were followed by morphological and pragmatic interference.

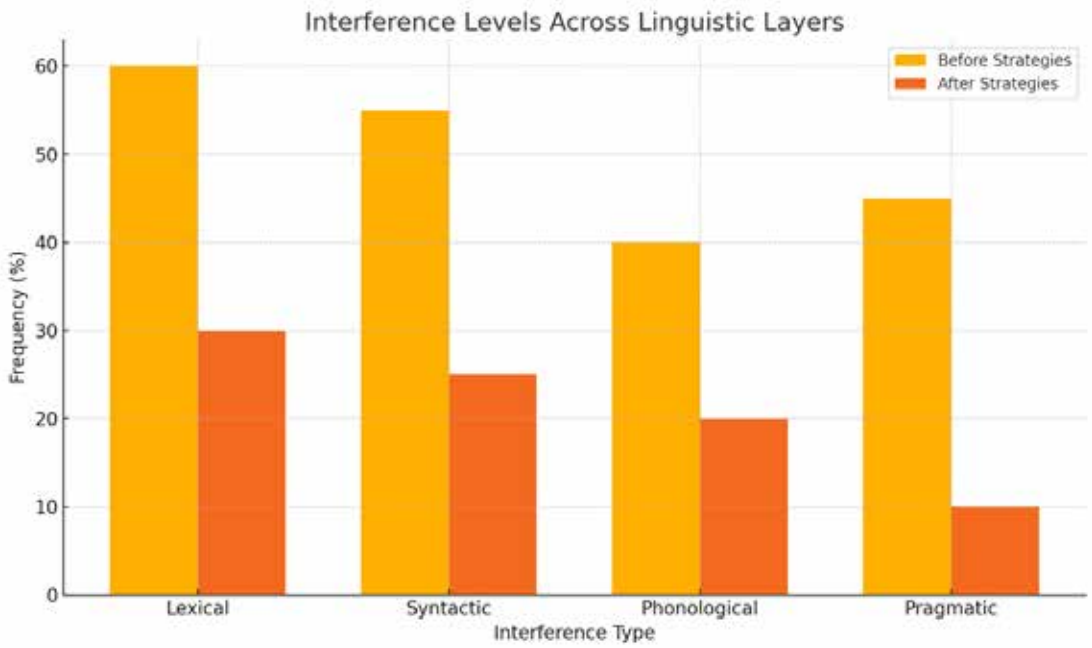

Рис. 1.

Information Loss: Complex sentences constructed by fatigued participants lacked important modifiers and less important ideas. In political speeches, for example, "in cooperation with our allies" was considered critical but was dropped altogether.

The analysis of data collected revealed that high levels of interference gave rise to errors and caused a 25% loss of information. However once emphasis on adaption was made the number reduced by 40% whereby the participants were able to remember 30% more information. The results can be visualized from the graphs below:

– One of the graphs shows how participants in the research experienced a high level of interference across different linguistic components.

– The second graph displays how much information was remembered through the different sessions of active instruction and five sessions of indirect instruction. However, retention level varied across different phases of the study.

Adaptation and Coping Strategies

It has already been established that the experiment was critical in helping the participants overcome fatigue, particularly through:

1. First, establishing control over cognitive load
2. Early and mid-sessions breathing methods
3. Giving breaks between 15 minutes before each session
4. Allowing the students to understand their working patterns by reviewing recordings 'after' each reasoning session

Conclusions. This research gathered theoretical concepts along with experimental evidence to explain the complex relationship between fatigue and negative language interference in SI. The results prove that fatigue is not just an emotional or physical state, but it is also a crucial cognitive factor that hampers crucial aspects of interpreting, which increases mistakes and subsequently leads to high levels of information loss.

From a theoretical perspective, this research is built upon prior research conducted by cognitive linguists and interpreting scholars using concepts of working memory (Baddeley, 2000), inhibitory control (Green, 1998), and cognitive load (Gile, 2009). In particular, the aims pursued in the study which were the aspects of inadequate cognitive workload on suppression of interference, SI fluency and interpretative accuracy and cognitive fatigue were accomplished. This broadens the sphere of ideas stated as Ivanova and Shevchenko's ideas about bilingual processing and cognitive fatigue are also valid within the Ukrainian context [6, 12, 10, 11].

In an experimental context the study showed how fatigue interacted with interference at lexical, syntactic, phonological and pragmatic levels. As the interpreting sessions increased in length and cognitive difficulty, language errors intensified, and especially language Structure errors, idiomatic approximations, and low semantic error ratios syntactic measures were more common. The sessions designed to bring about fatigue showed that when inhibitively stressed, interpreters resorted to shallow processing, resulting in literal interpreting, omissions or erroneous relevant ideas.

Subjects indicated the amount of fatigue, less introspective monitoring or reconsidering of actual solutions was noted and attributed to that fatigue. However, the last part of the experiment also demonstrated that interpreters have the capacity of endurance under certain weakening strategies.

As a result of mindfulness exercises, refinement of break times, and training on error analyses, interference errors decreased and retention of information improved. These observations stress the need for the implementation of fatigue-management measures into the training of interpreters.

Directions for Further Studies. In respect to this, it should be noted that the present research generates several issues that could be analyzed in the future:

1. Long-Term training: It may be valuable to investigate the effects of long-term application of fatigue-management strategies, like mindfulness practices and cognitive load exercises, on interpreters' performance.

2. Technology Integration: Evaluating the potential of CAI tools aimed at cognitive load reduction and fatigue alleviation might offer interpreters effective relief in high-stress situations.

3. Cross-Cultural Comparisons: Studying the effect of fatigue on interpreters of various language pairs, and in different cultures may expand our knowledge of the numerous interference patterns that exist.

4. Neurological Insights: Dissecting the effects of fatigue on interpreters through neuroimaging could better our understanding of cognitive mechanisms involved and suggest improved training approaches.

5. Professional Application: Exploring how these findings relate to actual setting such as political or medical interpreting involves the transition from theory to practice.

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Скрильник С. Вплив втоми на негативні інтерференції у синхронному перекладі

Анотація. Ця стаття присвячена аналізу ролі втоми у спричиненні негативної мовної інтерференції під час синхронного перекладу (СП). Безперечно, що надмірна втома має безпосередній вплив на перекладачів, оскільки вона погіршує їхню здатність концентруватися, використовувати короткочасну пам'ять і регулювати свої емоції. Як наслідок, це призводить до втрати інформації та подальших помилок. Відповідно до вищезгаданих теорій, зокрема моделі зусиль Джайла, моделі гальмівного контролю Гріна та моделі реконструктивної пам'яті Бадделі, основною темою обговорення буде те, як втома посилює інтерференцію при відтворенні змісту на всіх чотирьох рівнях: лексичному, синтаксичному, фонологічному, і навіть прагматичному. Двадцять магістрантів взяли участь в англо-українському перекладацькому експерименті, який продемонстрував ці ефекти. Учасники перекладали політичні промови з англійської на українську мову, враховуючи втому як модифікуючий фактор. Дослідження показало, що втома насправді мала кореляцію зі зростанням більш негативних інтерференцій, таких як надмірно дослівний переклад, надскладовий переклад та надмірна прагматика. З точки зору лінгвістики, неправильні споріднені слова та речення з невпорядкованою структурою були більш поширеними в найбільш виснажених сесіях. Крім того, кількість інформації, втраченої під час усного перекладу, зростала зі збільшенням втоми, що додатково впливало на якість усного перекладу.

Для вирішення цих проблем на останньому етапі експерименту були використані стратегії зняття втоми. Знання краще запам'ятовувалися, а інтерференційні помилки зменшувалися завдяки використанню тренінгів з аналізу помилок, вправам на уважність і плануванню відповідних періодів відпочинку. Ці висновки підкреслюють, наскільки важливо враховувати характеристики стійкості в рамках інтерпретації навчальних програм.

Крім того, що це дослідження надає підґрунтя для ретельного обговорення перспективних довгострокових тактик, використання технологій і тренувань, воно висвітлює динаміку когнітивної втоми в контексті шкідливого впливу. Крім того, це дослідження дає уявлення про те, як підвищити ефективність роботи перекладачів у складних умовах, поглиблює теоретичні знання та практичний досвід у сфері виконання усних перекладів. Результати дослідження мають значення для когнітивної лінгвістики загалом, а також для освітнього професійного контексту.

Ключові слова: когнітивні дослідження усного перекладу, синхронний переклад, тренування втоми, когнітивна гнучкість, мовна інтерференція.