

Language and cultural interference influence on inhibition of cognitive processes in simultaneous interpreting classes

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Abstract: This paper analyzes the impact of language and cultural interference on the inhibition of cognitive processes during simultaneous interpreting with the participation of bilingual students studying at the Taras Shevchenko University of Kyiv in Ukraine. This study investigates how language interference as a negative language contact phenomenon inhibits the interpreter's control of their source language while interpreting into the target language. Verbally competent B2-C2 English students were offered culturally colored interpretive speeches for two hours daily five times a week for two semesters. At first, the participants showed a 50% loss of culture-specific details and a 10-15% loss of inhibition control because source language cross-contamination could not be inhibited. However, using the inhibition techniques of anticipation, error analysis, training inhibition, and other cognitive strategies, the third month showed a significant improvement in cultural retention by 25-34% and inhibition control by 40% at the maximum. At the end of this experiment, the participants managed to suppress 80% of language cross-contamination, which proved the strategies efficient in the training program. Bilingual interpreters also require cognitive control and competency, and this presents both training and supervision management challenges when dealing with language interference.

Keywords: bilingualism, cognitive inhibition, interpreter training, language interference, simultaneous interpreting

1. Introduction

Language interference, commonly referred to as linguistic interference or negative language transfer, occurs when structures from one language influence the use of another language. When interpreters do simultaneous interpreting (SI), they have to understand the source language and speak in the target language at the same time. This makes them especially vulnerable to interference phenomena. The cognitive demands of SI, especially when people are bilingual or multilingual, make it even more important to have good control systems to

reduce this kind of interference. Inhibition, the process of blocking out irrelevant or contradictory information so that accurate interpretation can happen, is a key cognitive mechanism that helps with dealing with this linguistic interference. In the context of simultaneous interpreting classes, where students are still developing their interpreting skills, the impact of language interference can be more obvious.

This paper explores the extent to which language interference affects the inhibition of cognitive processes during SI tasks. Specifically, the research focuses on students from the 1st and 2nd year MA program in Translation (from English) at the Taras Shevchenko National University of Kyiv, aiming to show us how interference from the student's first language (source language) influences their ability to suppress irrelevant linguistic elements from their source language or other languages during interpreting into the target language. Namely, we set the objectives as follows.

- To determine whether language interference, as a form of negative language contact, significantly impacts the inhibition cognitive process in simultaneous interpreting tasks.
- To investigate the relationship between language interference and cognitive load, particularly focusing on how the interpreter's ability to inhibit source language culture-specific phrases, realia, precise information and cross-linguistic contamination affects overall interpreting performance.
- To examine the differences in the level of language interference and the efficacy of inhibition between 1st and 2nd year MA students in the Department of Translation from English at Taras Shevchenko National University of Kyiv.
- To provide insights into the cognitive strategies used by students to overcome language interference and enhance their SI skills, with potential implications for pedagogical approaches in interpreting training.

2. Theoretical background

This paper draws on a range of theories and research—from the foundational work of Weinreich (1953) on language interference to the more recent cognitive and neurocognitive insights from scholars like Friedman and Miyake (2004), and Hervais-Adelman (2011) et al. These works help frame my research on how language interference affects the inhibition process in simultaneous interpreting, especially among novice interpreters in a classroom setting.

Inhibition in SI involves the cognitive processes that enable interpreters to suppress interference from non-target languages and irrelevant information, allowing for accurate and efficient interpreting in real time. This skill is crucial, given the complex nature of SI, which requires the concurrent management of listening, comprehension, translation, and speech production.

2.1. Cognitive mechanisms of inhibition in SI

According to Bialystok (2001, 2007), Aron, et al. (2004) and Diamond (2013), simultaneous interpreters employ several inhibitory control mechanisms as follows:

- *Active Inhibition*: The deliberate suppression of competing language representations to prevent interference from the non-target language. This process is vital for maintaining clarity and accuracy during interpreting.
- *Overcoming Inhibition*: The ability to shift attention and response from one language to another, effectively managing the switch between languages. This skill is essential for adapting to the dynamic demands of SI.

These mechanisms are supported by executive functions, particularly those related to the central executive component of *working memory*, which oversees *attention control*, *inhibitory functions*, and *cognitive flexibility*.

The theory of cognitive inhibition has been extensively explored by Friedman and Miyake (2004), who describe inhibition as one of the executive functions essential for managing relevant information. In the context of bilingualism, they argue that the brain must continuously suppress one language to enable the fluent production of the other. This has particular relevance for interpreters who must inhibit the automatic activation of their source language while interpreting into their target language. Their research provides insight into the neural mechanisms that might underpin the cognitive challenges faced by interpreters when confronted with interference.

Costa and Caramazza (1999) extend the discussion of interference by examining how bilingual individuals manage competing linguistic systems, particularly in high-pressure tasks such as simultaneous interpreting. They found that bilinguals are more susceptible to language interference when cognitive load is high, as is the case in interpreting tasks where both comprehension and production occur simultaneously.

In his work on anticipatory strategies in simultaneous interpreting, Chernov (2004) provides another critical perspective and argues that skilled interpreters use anticipation as a cognitive strategy to mitigate the effects of interference.

This anticipation allows them to "predict" structures in the target language, thereby reducing the cognitive burden of dealing with interference from the source language. He emphasizes that a strong working memory and the ability to inhibit irrelevant linguistic structures are key to effective SI.

Contributions from neurocognitive studies in interpreting, such as those by Hervais-Adelman et al. (2015), have shed light on the neurological underpinnings of cognitive control in bilingualism. Their research indicates that simultaneous interpreting relies heavily on the brain's executive functions, including inhibition, and that sustained practice can lead to structural changes in the brain regions responsible for language control. This suggests that students' exposure to training could potentially modulate their ability to manage language interference over time.

One of the earliest and most influential works on language interference is that of Weinreich (1953), who introduced the concept of "interference" in his work *Languages in Contact*. Weinreich identified how structures from one language could "interfere" with the other, leading to errors or deviations in translation. His work laid the groundwork for understanding how bilinguals navigate the challenges of linguistic *cross-contamination*.

In the field of SI, Gile's (1995) Effort Models of interpreting, as one of the theories, contributed greatly to the aspect of the determination of cognitive load and the amount of this load that is allocated to various processes in SI. Gile (1995) divides the process of interpreting into three types of efforts of cognition: *comprehension and analysis, generation of the output, and storage of the information*. Gile (1995) stresses that interpreters work close to their limits, suggesting that extra difficulties, such as interferences caused by language, may add to the cognitive effort required and affect performance.

Built upon the previous studies, the current research assesses how language interference impedes the inhibition of cognitive processes within interpreting tasks. Some of the more recent research by De Groot and Christoffels (2006), however, has suggested that this may not be the case for newly-minted interpreters who struggle, especially in inhibition, as their cognitive systems are not as trained as that of most experienced interpreters. This is critical to my study as it provides another hypothesis that M.A. students in Interpreting studies in the first and second years of the program are likely to encounter most types of interferences and are unlikely to inhibit all the cross-linguistic and cross-cultural contamination.

2.2. Hypothesis

The hypothesis of the present study posits that the cognitive processing aspects of suppressing unwanted language units, also known as inhibition, are influenced by language interference and that bilingual interpreters who are not proficient in the target language are particularly vulnerable to it. More precisely, it claims that language interference makes it even harder to suppress distractors (like cultural language contamination or similar syntax) and unwanted source language elements, which, in the end, increases the processing load and adversely affects the quality of interpreting. In addition, the closer the target culture is to the first language, the more interference is likely because verbatim translation of sentence structures or idioms from the source language into the target language will occur despite a lack of comprehension from the perspective of semantics.

Language interference has historically been an issue of concern about errors committed by individuals in a bilingual community simply communicating with each other, particularly in an interpreting setting. The interpreters are bilingual means they speak two or more languages, and in such situations, they have to shift between and switch languages, which is a cause of cross-linguistic interference. Rapid comprehension and production of the source language in most cases engaged with simultaneous interpreting leave little time for filters within the brain, which work whenever the languages have to be changed. For interpreters with low competence in the second language, the task of suppressing a distractor like source language speech, structure, or even language sounds whose forms can be changed, becomes even more difficult, thus impairing their performance in SI.

2.3. Cognitive burden and inhibition process

Friedman and Miyake's (2004) executive function model comprehends inhibition as an information screening mechanism, and proper executive functioning is required regardless of the nature of such information being linguistic, environmental, or any other. In particular, considering bilingualism, this has to do with making sure that one language is kept at bay at every point in time while allowing the capacity for the use of another language. Consequently, for low proficiency in the target language, this problem becomes even more obvious and problematic since interpreters have difficulties suppressing their more proficient source language, which usually happens during target language mode, especially when a novice interpreter, Ukrainian source language and

English target language, tries to switch between these two languages. When the interpreter comes across sentences that do not have a clear correlation with similar structures in the target language, they may use the Ukrainian language structure even where there is no corresponding situation or language context in English. This phenomenon leads to the intrusion of the source language into the target language output. For instance, they may be deeply influenced by the “omnipresent” word “to have”. It is a typical vocabulary word that they would try to translate into an English context even if it does not make sense, for instance, the Ukrainian phrase “у мене є” and would in this case be translated as: “I have” irrespective of the sentence context which may have suited better when I own, or I possess. In Ukrainian “to have” directly means “to own, to possess”.

2.4. Role of cultural proximity in interference

One of the factors that contributes to the interference of languages is social and cultural factors. For instance, interpreters that are not culturally competent can be more interfered with by the nuances of idioms, structures and phrases as pointed out by Gile (1995). This is particularly clear between the Ukrainian and Polish, Russian and Czech language combinations which have a considerable degree of linguistic interference as the cultures are similar. Such bilinguals, however, tend to mix the two languages in SI.

To illustrate this point, let us take a Ukrainian-Polish bilingual interpreter who speaks Ukrainian but translates into English, recalling Polish idioms from the language. For example, the interpreter may use an English analogy, such as ‘piece of cake’, when interpreting Ukrainian speech only because the Polish idiom *bułka z masłem* (meaning ‘it is very easy to accomplish’) is used. There are also cases where the Polish analogy was used to define the translated Ukrainian phrase when it should have been replaced by others. For instance, an interpreter substituting the idiom *сидіти на двох стільцях* (translated as ‘to sit on two chairs’ which means ‘trying to please both in every way’) might be inclined to use the Polish ‘*chcieć mieć ciastko i zjeść ciastko*’ (translated as ‘want to have your cake and eat it too’) instead.

This can also extend to a Polish speaker with advanced knowledge of the Ukrainian language (target language) translating into English (L3). For instance, the Polish language has a sentence structure where “To jest” + the noun is commonly used; if such words go into English sentences constructed by the interpreter, they could be mixed up into ‘This is bread’ rather than simply saying

‘It is bread’. As a result of the practice in both languages, such instances of grammatical interference cause problems in the interpretation, and the message of the translation lacks coherence.

The issue of "false friends" is an additional factor that further complicates the process of bilingual interpreting. For instance, the Polish 'aktualny' meaning in English “current” and the Ukrainian 'актуальний' which translates as relevant in English. Even such words may sound the same, but they have various senses. These facts create considerable problems for the interpreter. If an interpreter replaces 'актуальний' with an equivalent of 'current', it could be very problematic in practice. A good illustration is a situation, when a Ukrainian declares, 'Ця тема актуальна', an interpreter will imagine translating it in the following way, 'This topic is something like a today', ‘This topic is of the present time’ and other variations of that kind.

2.5. Poor target language competence and increased susceptibility to interference

According to De Groot and Christoffels (2006), novice interpreters, as well as those with limited competence in their target language, are more prone to interference because their target language remains *incompletely automatized*. For students or interpreters with a low command of the target language, even the process of suppressing the source language is a hard task. Hence, when faced with complicated structures or rapid speech, the interpreter can *unconsciously* allow source language elements to be expressed, either in the form of syntax or lexis of the language.

Beginner interpreters, for instance, experience a challenge maintaining word order, which is a common problem in the English language. Typically, the dominant subject–verb–object structure in English is dominant, while it is not always the case in the Ukrainian language. An English-speaking bilingual interpreter attempting to assimilate the target language structure may erroneously employ the Ukrainian structure in English and say, “To the market went I” instead of “I went to the market”. When this happens, it can be attributed to the source language interference of their syntactic structures in English.

2.6. Language interference in cultural interpreting

A concrete example would be the problem of interpreting fixed literary expressions, idioms, or proverbs, which is difficult for very many interpreters.

Take for example the Ukrainian proverb “На городі бузина, а в Києві дядько” (literally ‘There is elder tree with berry in the yard and an uncle in Kyiv’ meaning that two things are unrelated). At this language level, an interpreter can be perfectly competent in the source language but may have difficulty locating a corresponding phrase. Rather, they would have gone for a literal interpretation which would leave the English version more often than not garbled or even senseless. Another interpreter would appropriately understand that “that emphasis is misplaced” means “that is completely out of context” rather than say “that’s adding the apple to the orange.”

In such cases, language problems not only return the negative outcome and frustrate the cognitive inhibition process but also bring about an unhealthy distortion of the ethnic values underlying the interpreting. Failing to fully understand both the language and the underlying culture of the target language leads to the diminished quality of the output by the translator: this is where the collision between language interference and low bilingual competency occurs.

3. Methods and strategies of the training experiment

The research was performed in two semesters with the specific subject group of 169 student-bilinguals at the Taras Shevchenko University of Kyiv aged 20 to 22. The selection criteria for these students was based on their knowledge of English as a foreign language, which was between B2 and C2 according to the scales of CEFR. All the participants were from the Translation Department, and 169 were native to Ukrainian, while English was the second language.

In the experiment, students were trained providently with the source language and the target language speeches every day, one session lasting about 2 hours a day, 5 days a week. Within the sessions, interpreting was performed for a maximum of 15 minutes and was followed by a short 5-minute cognitive rest. The experimental speeches used for this study were of cross-idiomatic comprehension, and these features enhance inhibition, so they served as good material to test inhibition.

To manage language interference in simultaneous interpreting, a strong cognitive foundation in inhibitory control, working memory, and cognitive load management is of paramount importance. The presence of language interference is especially problematic for bilinguals during simultaneous interpreting because when bilingual switches from one language to the other, both linguistic systems continue to remain activated. In that regard, inhibitory control is important as the

bilingual must suppress non-target language activation because one language may interfere with the other. Bilinguals with stronger inhibitory control are known to more effectively filter linguistic interference and focus on the intended language, thus supporting the claim made by Green and Abutalebi (2013). On the other hand, the complexity of interpreting tasks alongside amplifying cognitive burden requires enhancement of the strategies needed for overall cognitive control.

As working memory is also important in simultaneous interpreting, it is crucial to understand that it allows interpreters to store and process linguistic information actively while forming translations. Working memory, in turn, aids in decreasing language interference, with several studies demonstrating that interpreter training enhances working memory capacity (Babcock et al., 2017). This cognitive enhancement is especially valuable in countering high-speed speech input where the key ideas need to be held while significant restructuring of the target sentences is needed to conform to the syntactic and grammatical order of the target language. If interpreters do not have sufficient working memory resources, they are unable to keep things coherent, and this results in errors and omissions in the interpretations done by them.

To maintain efficiency in simultaneous interpretation, cognitive load strategies are important. Because of the higher level of effort required for the job, an interpreter needs to manage his or her cognitive resources, or else they will suffer from overload. Pre-task preparation, which is getting to know the field's terminology or culture, lowers the mental pressure of the interpreter by giving them a chance to try to solve problems rather than respond to them (Gile, 2009). Additionally, chunking techniques, which subdivide large amounts of information into smaller bits, allow an interpreter to better the intake and reduce the chances of being affected by the source language. This technique is especially helpful in complicated speeches since such speeches are usually difficult because of the large amounts of information and small cognitive capacities.

Training reinforces these cognitive approaches by using experimental methods. Simulated interpreting scenarios create specific contexts with different linguistic and situational variables that students can work with in order to polish their interference management skills. These trainee simulations can provide essential real-time feedback so that adaptive behavior strategies can be formed (Seeber, 2015). Exercises that promote inhibitory control, like the Simon task and go/no-go paradigms, are particularly helpful regarding the development of neural

structures that inhibit the processing of irrelevant stimuli. Such exercises help, especially, early bilinguals (Kapa & Colombo, 2013) and build stronger resistance against language intrusions (as they show enhanced cognitive flexibility), making them better equipped to handle challenging interpretation scenarios (Costa et al., 2008)

Another emerging integration of cognitive neurofeedback and cognitive training metacognitive tools in interpreter education provides new avenues for constant access to self-information. These devices change the focus of instruction from ‘what should the student do’ to ‘what the system intends for the student to do’. They also permit the monitoring of the students' cognitive activity in their brains, thus making them aware of their cognitive control, allowing for the modification of coping strategies for interference. It is expected that with the development of technology, these tools will be utilized even more to improve programs for training interpreters.

A number of cognitive approaches were employed during the course of these interpreting tasks to assist the students in coping with and preventing language interference:

- *Inhibition Training*: The technique here is to assist students to exercise inhibition of the source language through shadowing their performance and real-time corrections.
- *Anticipation Techniques*: They were able to prepare themselves for the expected target language syntactic structures and terminologies and hence able to suppress source language automatic responses more.
- *Error Analysis*: It was possible to hold several feedback sessions towards cases where language interference was obvious to help students identify their own areas of interference.
- *Cultural Competence Drills*: Students were still introduced to idioms and proverbs that are culture-specific and this was to be done to minimize the probability of these students translating such elements literally due to source language interference.

The purpose of this experiment was to determine the extent to which language interference would affect the students' inhibition process as well as their interpreting performance over time, as well as whether the strategies that were employed in this process would in any way help them to confront this interference.

3.1. The role of training in mitigating interference

Speaking about novice interpreters (using Chernov's (2004) anticipatory strategies), as well as the cognitive load theory presented by Gile (1995), it is implied that the negative effects of interference can be lessened by directed training towards improving target language cultural proficiency and *cognitive inhibition control*. Students must be taught to deeply understand the target language within which they are trained and to block out as much cross-linguistic dust as possible from the source language as their first language. This is crucial, especially in dialectically or culturally complex phrases or syntactic constructions where mere literal translation is not enough.

3.2. Simultaneous interpreting training strategies to boost inhibition and overcome interference

Effective training strategies are crucial to assist the students in simultaneous interpreting programs in overcoming the negative language interference that may arise from using two languages at the same time, particularly in situations when bilingualism and low target language competence worsen such case scenarios. As interpreting demands both language proficiency as well as high cognitive control, it is imperative that the training programs aimed at these students not only centre on their language abilities but also their executive skills – inhibition in particular. In this way, students are able to correctly predict when they are likely to be interrupted semantically and omit uncooperative source language for the interpreting tasks needed.

Research in cognitive linguistics has investigated how language interference affects SI and identified multiple strategies to lessen its impact. Marian and Spivey's (2003) studies show that bilinguals engage both languages concurrently when understanding speech, which can produce interference between them. The research demonstrates that interpreters need to develop powerful inhibitory control abilities to prevent the activation of languages they are not currently using.

Research on bimodal bilingual individuals demonstrates that handling two languages across different modalities, like spoken and signed languages, results in improved cognitive control. Training programs designed to improve cognitive flexibility and executive functioning show the potential to decrease language interference for interpreters.

SI training strategies focus on improving inhibition control along with anticipatory processing cultural adaptation and cognitive load management to minimize language interference. The training approach based on Green's

Inhibitory Control Model (2013) and validated by Costa, et al. (2006), Emmorey, et al. (2008), and Macnamara and Conway (2014) enables interpreters to control source language interference by using lexical suppression exercises together with dual-task training. The Model of Anticipation by Chernov (2004) shows that anticipatory processing improves interpreters' ability to forecast speech content. Then, this leads to a processing speed enhancement, according to Dong and Li (2019), and suggests that predictive mechanisms in interpreting may improve processing efficiency to clearly identify cultural priming techniques as essential for cultural adaptation (Marian & Spivey, 2003). The Effort Model introduced by Gile (1995) studies the solutions for reducing cognitive load in simultaneous interpreting. This model examines the allocation of mental resources among several cognitive tasks—listening, memory, and speech production—rendering it crucial to implement training methods that improve cognitive efficiency. Research on shadowing techniques, delayed interpretation, and split attention tasks shows that these methods help improve working memory and attentional control in interpreters (Moser-Mercer, 2000; Seeber, 2015). Recent research by Fantinuoli (2023) has examined how AI-assisted interpreting systems facilitate cognitive load management by offering predictive text and automatic glossaries, thereby diminishing the mental effort needed for terminology retrieval during simultaneous interpretation. Interpreters achieve effective management of high-pressure multilingual situations through combined strategies, which in turn stimulate research into technology-aided training methods and neurolinguistic cognitive control techniques.

3.3. Training inhibition and cognitive control

Students should not only be trained in language but also in their executive function skills and specifically in their ability to control distraction and interference. For students to improve filtering relevant from irrelevant language during SI, cognitive training exercises should be incorporated into the training programs.

- *Inhibition Focused Training Activities:*

Exercises to enhance inhibition focus may be incorporated into the course of interpreter training. For example, dual tasking during interpreting that entails language switching from source language to target language within a short span of time can enable learners to perfect the repression of source language constructs. Complexities can be cumulatively added to these tasks over time in

order for the learners to be in a position to reduce unwanted language interference.

For example, the students interpret sentences from English into Polish and move on to more difficult tasks, like bringing idiomatic expressions like ‘piece of cake’ while deliberately refraining from phonetic translations such as ‘kawałek ciasta’ in Polish. The training is towards inhibiting inappropriate source language equivalents. That is inhibiting ‘Polish English’ i.e. direct English- Polish translations that are likely to confuse interlocutors.

- *Coactive Interpreting*: Many working memory activities, such as simultaneous interpreting, heavily rely on the retention and processing of information, which is why activities to develop students' passive filtering while working on the fluency of the target language are needed to develop. Techniques such as paraphrasing, shadowing, or even simultaneous interpreting with a time lag would assist students in utilizing target language synthesis with source language representation, while the former tends to interfere with working memory.

For example, the students interpret political speeches with a 2-second gap during which English complex sentences such as the one that says “The bill was passed unanimously” are not, for instance, transformed in Polish into “Rachunek został jednogłośnie zatwierdzony” which is an inaccurate quasi-literal version.

Another example is: While performing shadowing of a Ukrainian speech, the learner interprets it, say the sentence “Він завжди допомагає іншим” becomes ‘He is always helping others’, which is correctly said in English despite the present progressive tense.

Educating students to inhibit their native language structures, like awkwardly literal translations of verb forms in their second language sentences.

- *Dual Language Performance and Cognitive Load Management Strategies*: Citing Gile’s model of interpreting (1995) explains how interpreters are psychologically burdened when there is a dual use of languages while interpreting in real time. To balance the mental workload, actual interpreting tasks or situations can instead be remedied by training in classrooms. Structured simulated high cognitive load interpreting practice of close-to-real-life work scenarios is another strategy extending over the passive cognitive-step approach. Such practices include *interpreting under time pressure*, *double encoding*, or *attention division between languages or tasks*.

For example, students have to orally translate, from English into Ukrainian, a speech that is three minutes in duration and that has an argument and case distribution.

The strategy prevents the students from assigning the pattern of the Ukrainian language sentences to the English equivalent, such as “Тут занадто шумно” which in Ukrainian is directly translated as “It here is too noisy”.

3.4. Anticipatory strategy

According to Gile’s (1995) model of cognitive load, anticipatory strategies constitute a crucial approach to interpreting without any intrusion of working memory, thanks to the stepwise process.

This kind of anticipatory strategy consists of predicting the likely turn that the discourse will take while considering the surrounding situation. The speaker only helps interpreters to inhibit source language whenever it is not needed, instead of focusing on their target language patterns

- *Contextual Anticipation Training*: One way that trainers can structure their students’ practice is by having them interpret within specialized fields (legal, medical, diplomatic, etc.), which includes predictable terms and frustrating structures. It helps to reduce source language errors as the interpreters typically have some sense of the discourse and, therefore, expect certain structures, words, or phrases. Such content-based instruction allows them to learn relevant vocabulary, so in legal interpreting, for instance, the learners are taught certain legal terms that are formally used in constructing sentences, which would preclude irregular source language interference instantly.

- *Pattern Recognition*: It is possible to train interpreters to alert targets that help them image patterns in the target language so that they predict what the speaker is likely to say next. Although shadowing activities can assist students in cultivating this skill, real-time predictions of forthcoming words or phrases remain inaudible to them at that moment. As the effort continues, many students will be able to identify and pick a pattern in the target language, thus making it easy for them to inhibit source language interference of language that would be irrelevant to interpreting.

3.5. Error analysis and feedback

The feedback and error analysis are very important in displaying the student's specific identifiable facts of what interference was done and techniques on how to combat it.

Feedback activities during which students' performing interpreting skills are viewed as an outcome of different cognitive activities can yield useful information about such interference and its reasons.

- *Targeted Feedback on Interference Errors*: Teachers can provide feedback on specific cases whereby students committed to interpreting but poured source language features on the target language. This may comprise wrong words, wrong syntax, and wrong pronunciation. This is because after understanding where and why these interferences occurred, students will be more careful about such patterns in future activities.
- *Peer Review and Collaborative Learning*: Equally, the students can take part in peer review activities where they imagine the reviews that the performance reviewee will by themselves learn of all the moments of interference and how to counter each. Such methods can help address the interference issue as well as improve the addressing strategies.

3.6. Cultural competence

It was mentioned previously that close cultural relationships may enhance language interference. This is particularly the case when interpreting inter-languages that contain lexically, phrasally, or syntactically overlapping idioms. To solve this, interpreting training should involve a very strong emphasis on cultivating cultural awareness.

- *Culturally Embedded Learning and Contextual Learning*: Cultural knowledge assists interpreters in differentiating phrases or strategies in the source language from their target language variations and coming up with the corresponding translation whose context is in the target language. Trainers can enhance cultural immersion by researching movies, reading books, and participating in the culture of the source language and target language.
- *Idioms and Expressions Emblematic of the Culture*: It is critical to guide students in terms of the comprehension of culture-specific terms and how best to convey these into the target language. Engagements in which students are required to translate certain expressions, for instance, idioms, proverbs, and culture-specific phrases, can help them build mechanisms for dealing with interference in culturally oriented tasks. For instance, as an exercise, 'warm your heart' may be a literal translation from another language, and this will call for a critical reasoning ability to translate it in context rather than literally.

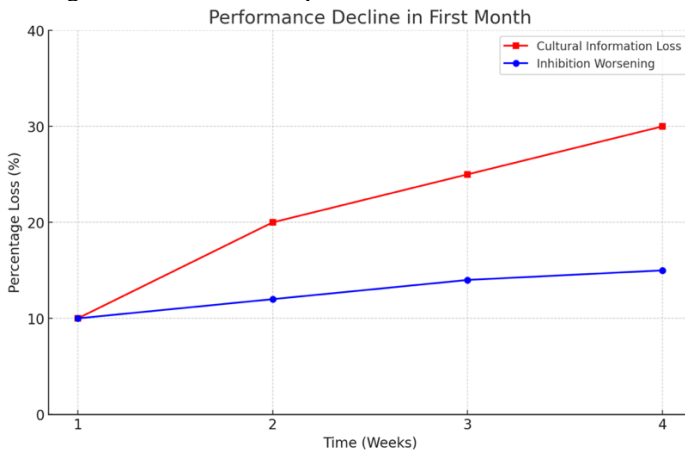
4. The results of the experiment

First Month: Initial Struggles

In the first month of the experiment, the participants struggled greatly with language interference. This was in particular because they were able to control source language influences when interpreting the target language.

Inhibition and cognitive load management also got worse during this phase because the students had difficulties with some speeches that were culturally colored with some idiomatic expressions and complex sentences.

- *Inhibition Decline*: The capacity to control language interference due to source language deterioration decreased by 10-15%. Students overgrew with source language using structures or the order of phrases when interpreting the sentences, and so improper or inaccurate translations were produced.
- *Increased Cultural and Precise Information Loss*: Within this time frame, culturally precise information loss had grown to 30%, so students were not making correct cultural interpretations and errors in translations were evident.

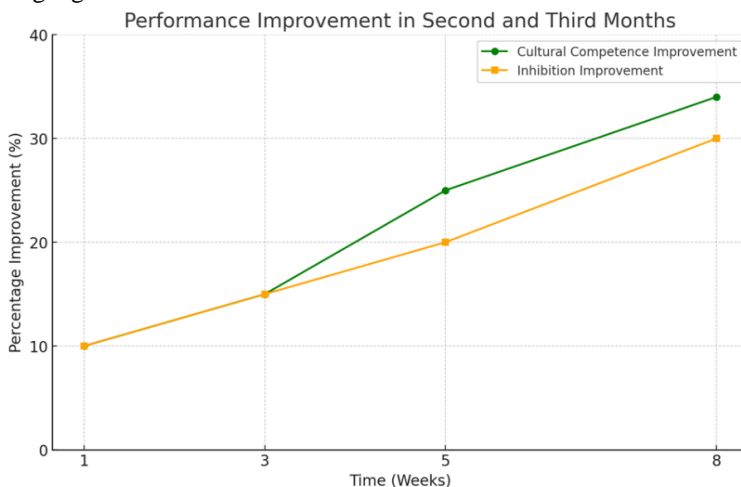


Second and Third months: Improvement of Performance

For the second and the third months, there was a great change and the performance of the students. This was the period where the techniques and strategies used in the experiment started bearing results. Regular inhibition practice and feedback with anticipatory approaches made the learners able to cut down source language internal interferences over the total consolidation duration.

- *Better use of Inhibition*: The ability to inhibit the interference of the student's first language showed an improvement of 10-20% by the second month. They were able to make efficient use of cognitive load and avoid source language elements interfering with their interpreting.

- *Improvement of Cultural Competence and Precision*: The students displayed a 25-34% improvement in their ability to recognize and interpret culture-bound elements accurately. Their efficiency when working in the target language also improved as they were able to translate more idioms and deal with more complex structures in the target language without being interfered with by the source language.



End of the Experiment: Significant Improvement

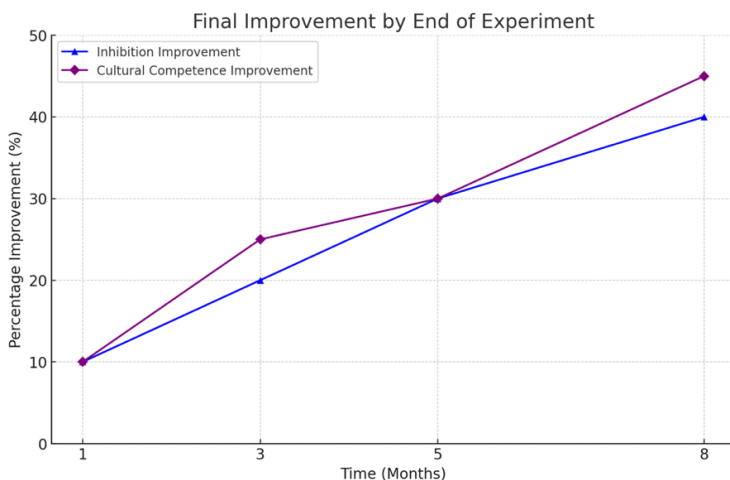
End of the Experiment: Notable Progress

The use of language strategies had a considerable influence on the learners' capacity to control language interference and to enhance cognitive inhibition at the end of the research study after two whole semesters of practising interpreting. Such strategies, alongside inhibition techniques, later developed into consistent anticipation strategies that impacted their performance remarkably.

- *Inhibition Process*: The overall effectiveness of the source language inhibition increased by about 30-40%, and there were some remarkable changes in the

freedom of the students to remove irrelevant source language units during interpreting.

- *Cultural Information and Precision*: The students' focus on culturally specific speech interpreting rose significantly, with less than 5% cultural information loss. The overall proficiency of the subjects in the encoding of complex syntagms and idiomatic speech in the target language neared that of native speakers by the end of the experiment.



The result of the experiment.

It was seen in the experiment that at first, language interference was a factor that contributed to the student's failure to cope with the difficulty of the inhibition cognitive process, which resulted in a decrease in interpreting accuracy as well as cultural understanding. However, after consistent performance along with the application of some specific techniques – such as inhibition, anticipation as well as error analysis, the outcome improved considerably more than expected. By the conclusion of the experiment, the learners had not only recovered from the effects of interference, but they also achieved an enhancement of their cognitive control, leading to the provision of accurate and culturally appropriate interprets.

4.1. Cultural interference inhibition

To replicate the difficulties interpreters encounter in the real world while handling cross-cultural material, culturally relevant and near-target language metaphors and realia were incorporated into each interpreting session as part of the experimental design. Over the course of four months, 4,000 culturally significant metaphors and realia were included in the speeches. These components were picked because they have strong cultural ties to the target language (English) and were meant to assess the student's capacity to handle source language interference.

When interpreting these metaphors and realia into the target language, the students found it difficult to suppress their source language culture due to the nature of language interference. Significant cultural contamination resulted from the students' frequent use of direct translations from their source language rather than appropriately translating the culturally distinctive content into English. Half of the culturally distinctive aspects were either mistranslated or completely missed during the interpreting sessions, as evidenced by the 50% realia and metaphor loss rate during the first two months of the experiment.

The Table below includes 50 Ukrainian realia: their explanations, accurate translations, false translations, and equivalents where each of the errors was explained. This separation helps to explore the cultural and linguistic troubles the students encountered during the experiment more broadly.

Category	English Realia	Correct Ukrainian Translation	False Translation/Equivalent	Explanation of Error
Food	Clam Chowder	Крем-суп із молюсків	Юшка з риби	Misinterpreted as a fish soup due to lack of direct equivalent.
	Pumpkin Pie	Гарбузовий пиріг	Яблучний пиріг	Cultural substitution with apple pie, a more familiar dessert in Ukraine.
	Root Beer	Кореневе пиво	Пиво	Misunderstood as alcoholic due to "beer."
	Fish and Chips	Риба з картоплею фри	Риба з чипсами	False friend: "chips" confused with packaged snacks.

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Category	English Realia	Correct Ukrainian Translation	False Translation/Equivalent	Explanation of Error
	Twinkies	Твінкі	Тістечка з кремом	Misinterpreted as generic cream-filled pastry.
	Bagels	Бейгли	Бублики	Cultural confusion with "бублики" (ring-shaped bread).
	Buffalo Wings	Баффало крила	Курячі крила з соусом	Omission of the cultural reference to Buffalo, NY.
	Cornbread	Кукурудзяний хліб	Білий хліб	Generalized as "white bread" due to unfamiliarity.
	Peanut Butter	Арахісова паста	Масло	Confusion with butter, leading to incorrect substitution.
	Grits	Кукурудзяна каша	Пшоно	Substituted with millet, which is more familiar.
Politics	The White House	Білий дім	Адміністрація президента	Cultural replacement with Ukrainian political equivalent.
	Electoral College	Колегія вибірників	Коледж	Misunderstood as an educational institution.
	Swing State	Коливальний штат	Гойдалка	Literal translation omitting political meaning.
	The Oval Office	Овальний кабінет	Офіс	Simplified to "office," losing symbolic meaning.
	Capitol Hill	Капітолійський пагорб	Верховна Рада	Confused with the Ukrainian Parliament.

Category	English Realia	Correct Ukrainian Translation	False Translation/Equivalent	Explanation of Error
	Filibuster	Філібастер	Протест	Incorrect generalization as "protest."
	Federalism	Федералізм	Конфедерація	Confused with confederation.
	Swing Vote	Вирішальний голос	Випадковий голос	Literal translation missing context of decisive vote.
Animals	Bald Eagle	Білоголовий орлан	Орел	Lost symbolic significance in simplified translation.
	Raccoon	Єнот	Борсук	Confused with "badger" based on appearance.
	Bison	Бізон	Корова	Mistaken as cow due to visual similarity.
	Moose	Лось	Олен	Confused with "deer."
	Coyote	Койот	Пес	Simplified to "dog," losing cultural context.
	Grizzly Bear	Грізлі	Ведмідь	Generalized as "bear."
	Prairie Dog	Прерійний собака	Собака	Mistaken as a domestic dog.
	Roadrunner	Дорожній бігун	Швидкий страус	Misinterpreted as ostrich.
Places	Grand Canyon	Великий Каньйон	Велика долина	Incorrectly generalized as "large valley."
	Silicon Valley	Кремнієва долина	Долина Силікону	Misinterpreted due to false friend (silicone).

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Category	English Realia	Correct Ukrainian Translation	False Translation/Equivalent	Explanation of Error
	Route 66	Шоце 66	Автострада 66	Lost cultural significance as a historic route.
	Las Vegas Strip	Лас-Вегаська смуга	Вулиця казино	Simplified as "casino street."
	Hollywood	Голлівуд	Фабрика мрій	Misinterpreted with its nickname "Dream Factory."
	Wall Street	Уолл-стріт	Бізнес-центр	Generalized as a business district.
	Yellowstone National Park	Йеллоустоунський парк	Великий ліс	Simplified to "large forest."

Cities

	Boston	Бостон	Лондон	Mistaken as London due to cognitive overload.
	Chicago	Чикаго	Чилі	Confused with chili, resulting in phonetic error.
	San Francisco	Сан-Франциско	Лос-Анджелес	Mistaken for Los Angeles.
	Washington, D.C.	Вашингтон	Штат Вашингтон	Misinterpreted as Washington state.
Cultural Terms	Thanksgiving	День Подяки	Свято урожаю	Simplified to a harvest festival.
	The Fourth of July	Четверте липня	День незалежності	Replaced with Ukrainian Independence Day.
	Halloween	Хелловін	День всіх святих	Confused with All Saints' Day.
	Black Friday	Чорна п'ятниця	П'ятниця 13-го	Misinterpreted as Friday the 13th.
	Mardi Gras	Марді Гра	Карнавал	Generalized as a carnival.

Category	English Realia	Correct Ukrainian Translation	False Translation/Equivalent	Explanation of Error
Objects	Baseball Bat	Бейсбольна бита	Палиця	Simplified as "stick."
	Cowboy Hat	Ковбойський капелюх	Шапка	Generalized as "hat."
	Hot Dog	Хот-дог	Ковбаса	Replaced with sausage due to cultural familiarity.

In the first two months, most of the realia related to food, animals, places, and cities, were not accurately carried out as they were affected by the source language since it was the 1st language that was dominant. For example, students were not able to inhibit their source language when faced with items, such as “Clam chowder” and “Grizzly bear” that were unique to the target culture.

Many errors were recorded when the students replaced strange and foreign cultural items with something they knew in their source language, where ‘pumpkin pie’ was replaced with ‘яблучний пиріг’ (apple pie). This demonstrates a tendency for natives to try to relate whatever idea is being presented to a foreign view with the concepts they already have whenever they are placed under cognitive stress.

Words like "root beer" or "college" posed issues since students interpreted them according to what appeared to be their source language equivalents on the surface. When interpreting the term "Electoral College," the concept of an educational institution is frequently used as an example.

It appears that cognitive overload led to the incorrect diagnosis of cities like Boston and Chicago, where students identified the phonetic components and connected them to well-known locations like London or a well-known food, chilli. The misinterpretation of realia was made worse by the influence of time. Under such pressure, students often translated Swing State as "гойдалка" (swing), which was too near to the original and utterly altered the intended political connotation. This illustrates how the pupils' cognitive overload made it impossible for them to appropriately understand culturally contextual circumstances.

Some students frequently went into very deep cultural levels. For example, the eagle's situationally significant meaning to American culture was not justified because it was translated as merely the bald eagle. Because of its outward

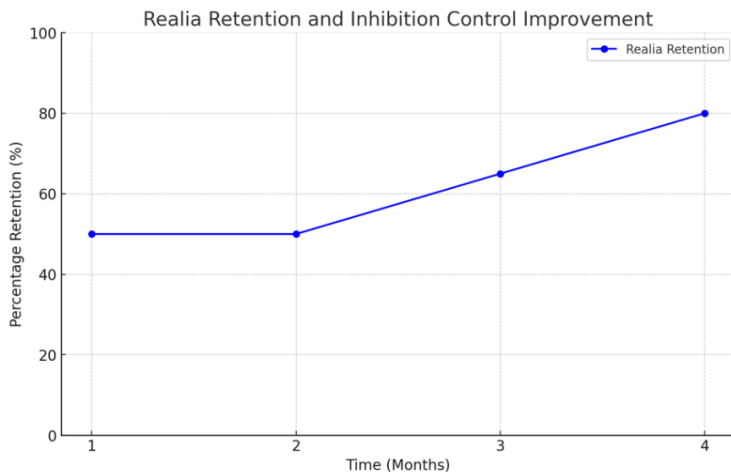
resemblance to an ostrich, the roadrunner, an American species that is well-known to Ukrainians and Poles, was mistakenly dubbed "страус." It draws attention to how easily participants had to cope with cognitive overload and the lack of common cultural references.

An obvious indication that students had limited exposure to cultural icons that were specific and had definite clarities was the overgeneralization of place names, such as the Grand Canyon, which were referred to as "велика долина" (big valley).

The students also made certain mistakes by substituting familiar items from the source language culture for the ones that were already there since they did not comprehend the cultural context. For instance, "яблучний пиріг," a popular delicacy in Ukraine, was used in place of pumpkin pie. This showed that students adopted pre-existing concepts whenever they couldn't think of new ones.

Similarly, using "адміністрація президента" when translating The White House can be interpreted as an inappropriate attempt to draw attention to Ukraine's presidential administration, which presents some challenges because of the influence of the source language cultural parallels.

However, by the third and fourth months, their performance improved tremendously. The students were able to better control their source language interferences when speaking under time constraints by repeatedly doing *inhibition-based exercises* like dual-tasking and *quick language switchover*. As the students got accustomed to using culturally complex terminology, metaphors, and idioms instead of relying just on erroneous equivalents—even substituting "apple pie" for "pumpkin pie"—increased cultural competency also greatly aided them. *Frequent feedback and error analysis* sessions helped them identify and practice avoiding other typical mistakes, such as the overuse of political terms like "Electoral College" and the false friends of "root beer." *High cognitive task complex instruction* improved students' multitasking skills while working memory exercises like *shadowing and paraphrasing* assisted students in internalizing complicated information without the need for the source language schemas. The development of *anticipation strategies* enhanced students' capacity to anticipate the target language forms, leading to more suitable translations in a particular context. As a result of these efforts, students were able to maintain a significant amount of cultural information, effectively manage cognitive load within three months, and inhibit 80% of cross-language interference. As a result, students' performance in interpreting was more fluent and culturally appropriate.



In the early cases of the experiment, source language interference led to 50% of the culture-specific information being lost along with realia, at the final stages, the experiment resulted in 80% of cross-language contamination reduction, and for the students (based on their feedback), it became easier for them to perform culturally colored interpreting.

5. Concluding remarks

The purpose of this research project was to understand the influence of language interference on the simultaneous interpreting outcome during the inhibition of cognitive processes. It examined theoretically and experimentally how language interference affects the cognitive inhibition process during simultaneous interpreting, with a particular focus on bilingual students at Kyiv's Taras Shevchenko National University. Students initially had trouble understanding cross-linguistic contamination, especially when it came to deciphering culturally distinctive realia and metaphors, as the experiment showed.

The research results provide practical and helpful insights into the challenges bilingual interpreters face in managing language interference in the majority of culturally colored interpreting environments. It demonstrates how, in the lack of proper training, interpreters frequently use the source language forms they are

accustomed to, which ultimately leads to the inappropriate adoption of false equivalents, excessive metaphor extrapolation, and the loss of crucial cultural knowledge.

The study has a practical significance. Interpreter training programs can be organized by deliberately including high-level cognitive activities, error correction, and inhibition-oriented tasks. Trainers can employ comparable techniques to help students with their language barriers and enhance their interpreting skills at any time of day. In order to help interpreters properly manage and modify their performance during the interpreting process, this study also highlights the impact of feedback and anticipatory tactics on metacognitive regulation capacity.

It would be beneficial to look into how interactive interpreters employ technology to either strengthen or weaken cognitive inhibition. A future longitudinal follow-up project may also focus on determining how the techniques are modified for professional interpreting and multilingual encounters. It could incorporate computer-assisted interpreting tools and use them to evaluate the cognitive control of interpreters, assess the impact of glossaries and automated prompts on cognitive burden, how technology affects interpreters' source language inhibition, and whether a shortage of these resources could eventually impair necessary abilities. Future research could also look more closely at the effects of environmental and emotional elements like stress, exhaustion, or even noise.

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