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In Search of Equivalent: Issues of Translation and Text Interpretation

В пошуках еквівалента: проблеми перекладу та інтерпретації тексту

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Fluctuations in Attention During Consecutive Interpreting

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У статті досліджується феномен флуктуації уваги, тобто короткочасної зміни фокусу уваги, на ключових етапах послідовного перекладу (сприймання, нотування та переформулювання) *з метою* конструювання інтегративної когнітивно-емпіричної моделі, яка враховує як внутрішні, так і зовнішні причини флуктуацій уваги на різних етапах послідовного перекладу, оцінює їх вплив на якість і точність перекладу та інтегрує когнітивні й емпіричні стратегії, що можуть бути застосовні для їх подолання і регуляції.

Матеріалом слугували серії перекладацьких сесій професійних і початківців-перекладачів, корпус аудіо- та відеозаписів із різних фахових сфер, перекладацькі нотатки та транскрипти вихідних і цільових текстів.

Методологія поєднує емпіричний аналіз (моніторинг рухів погляду, візуальної концентрації та часових пауз) із когнітивно-аналітичними інструментами, зокрема шкалою NASA-TLX, аналізом перекладацьких дилем і SWOT-моделюванням для відтворення перекладацьких рішень у режимі реального часу за умов флуктуації уваги.

У статті розглядаються концепції уваги в когнітивній психології та когнітивній транслятології, аналізуються моделі послідовного перекладу з позиції когнітивної переробки інформації, визначаються типи флуктуацій уваги та шляхи їх вимірювання.

Отримані результати засвідчили, що флуктуації уваги мають безпосередній вплив на точність і темп перекладу, структуру нотаток і вибір перекладацьких стратегій. Результативність перекладу визначається здатністю перекладача передбачати, перерозподіляти та відновлювати увагу між етапами послідовного перекладу. Контроль уваги має динамічний характер і пов’язаний зі складністю завдання, досвідом перекладача та зовнішніми чинниками. Кількісний аналіз підтвердив кореляцію між підвищеним когнітивним навантаженням, зростанням варіативності уваги та зниженням точності й плавності мовлення.

Центральною інновацією дослідження є розробка когнітивно-емпіричної моделі контролю уваги, яка поєднує поведінкові індикатори з вищими когнітивними механізмами й описує цикли флуктуацій і відновлення уваги. Запропонована модель доводить адаптивний і тренований характер уваги та обґрунтовує систему стратегій, спрямованих на ефективне управління увагою як невід'ємної складової для оптимізації послідовного перекладу.

Ключові слова: когнітивна транслятологія, сценарії процесу послідовного перекладу, когнітивно-емпірична модель контролю уваги, когнітивна ефективність, точність перекладу, стратегії контролю уваги та стресу.

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Introduction

The study of fluctuations in attention during consecutive interpreting is of significant importance within the interdisciplinary domains of translation studies and cognitive linguistics. Consecutive interpreting is an extremely complex cognitive task that requires interpreters to simultaneously listen to and understand the source language, retain important information in working memory, and accurately reformulate and articulate speech in the target language, all within strict time constraints. This complex multitasking imposes significant demands on attention resources, so studying fluctuations in attention is essential for understanding how interpreters manage cognitive load and make decisions in real time. By analyzing these fluctuations, researchers can gain a deep understanding of the processes by which interpreters distribute, maintain, and shift attention between different aspects of the interpreting task, including listening, note-taking, and speaking.

A number of scholars have contributed substantially to the understanding of attentional dynamics and fluctuations in attention during consecutive interpreting.

Chernov within his theory of probabilistic prediction, emphasized the anticipatory nature of comprehension in interpreting and demonstrated how attention continuously oscillates between incoming speech, prediction of meaning, and monitoring of output [Chernov, 2004]. His work highlights that attentional instability often emerges when prediction mechanisms fail or when discourse redundancy is insufficient.

Pöchhacker approached attention from a discourse- and process-oriented perspective, stressing the role of discourse comprehension in managing cognitive resources during consecutive interpreting [Pöchhacker, 2016]. He argues that attention fluctuates depending on discourse structure, genre, and communicative intent, with higher attentional demands observed during dense informational segments and discourse transitions. This view aligns with research showing that interpreters' attention is not uniformly distributed but dynamically reallocated throughout the interpreting task.

More recent empirical research has focused on temporal changes in attention. Barbara Dragsted employed process-oriented methods to investigate pauses, hesitations, and reformulation patterns, demonstrating that moments of attentional overload often coincide with increased disfluencies and strategic omissions [Dragsted, 2005; 2010]. Similarly, Shlesinger examined the relationship between attention, rhythm, and segmentation, showing that attention fluctuates in response to prosodic cues and speech rate, particularly during the listening phase preceding consecutive delivery [Shlesinger, 2002].

Finally, research on note-taking in consecutive interpreting by Szabó [Szabó, 2006; Chen, 2016] highlights attention switching as a critical mechanism. These studies show that interpreters must constantly oscillate between listening, information processing, and visual-motor activity, making note-taking a major source of attentional fragmentation. Inefficient note-taking strategies are shown to increase attentional fluctuations and negatively affect recall and target-language reformulation.

Recently, research in interpreting has increasingly focused on the cognitive aspects of translation quality [Muñoz Martín, 2017]. Studies by Gile [Gile, 1995], Moser-Mercer [Moser-Mercer, 2000], and Seeber [Seeber, 2017] have examined models of effort, cognitive strain, and split attention during interpreting tasks.

Further research in the cognitive approach [Liu, Schallert, Carroll, 2004; Köpke, Nespoulous, 2006] has expanded this line of inquiry by focusing on working memory capacity, attentional control, and executive functions involved in interpreting processes. These findings suggest that fluctuations in attention are closely linked to individual differences in cognitive control and bilingual language processing, particularly during phases of information retention and reformulation typical of consecutive interpreting. These studies underline that attentional lapses may result not only from task complexity but also from limitations in executive coordination.

Neurocognitive approaches have also enriched this field. Hervais-Adelman, Moser-Mercer, and Golestani used neuroimaging data to demonstrate how sustained attention and cognitive control networks are engaged differently in novice and experienced interpreters, suggesting that expertise reduces the amplitude of attentional fluctuations by automatizing certain processing routines [Hervais-Adelman, Moser-Mercer, Golestani, 2015].

Advances in eye-tracking technologies, electroencephalography (EEG), and process-oriented research approaches have facilitated the cognitive-empirical observation of shifts in attention and peaks in information processing. Complementary EEG-based studies by Proverbio et al. provide evidence that attentional shifts during interpreting are reflected in measurable neural correlates associated with cognitive load and monitoring [Proverbio, Cok, Zani, 2002].

Taken together, these studies demonstrate that fluctuations in attention during consecutive interpreting are multidimensional, shaped by task structure, discourse features, interpreter expertise, cognitive control mechanisms, and external constraints. From the ***translation studies*** perspective, studying fluctuations in attention has practical implications: it helps design more effective interpreter training programs, guides the development of strategies to enhance concentration and memory retention, and helps optimize working conditions to reduce cognitive overload. From a ***cognitive linguistics*** perspective, this study expands our understanding of the dynamic relationship between language processing and attention regulation, illustrating the interplay of language comprehension, memory, and speech production in the interpreter's cognitive system. Furthermore, such research lays the foundation for developing evidence-based interventions and tools to help both novice and experienced interpreters maintain optimal performance under challenging and stressful conditions.

Despite growing cognitive-empirical evidence, the temporal dynamics of attention across different stages of consecutive interpreting remain underexplored, underscoring the need for integrative cognitive-empirical models capable of capturing short-term attentional shifts and their impact on interpreting quality.

The *aim* of the study is to develop an integrative cognitive-empirical model of the consecutive interpreting process that accounts for both internal and external causes of attentional fluctuations across processing stages, asseses their impact on interpreting quality, and integrates cognitive, strategic, and attentional control strategies applicable to both experimental research and interpreter training.

To achieve this aim, the study sets the following *objectives*: 1) to explore the concepts of attention in the fields of cognitive psychology and translation studies; 2) to analyze models of consecutive interpreting and their cognitive aspects; 3) to investigate the phenomenon of fluctuations in attention; 4) to study fluctuations in attention in three main scenarios of consecutive interpreting process; 5) to build an integrative cognitive-empirical model of attentional control during consecutive interpreting based on theoretical perspectives and empirical data; 6) to propose training strategies for attentional and stress control based on the empirical results.

The study is based on a corpus of consecutive interpreting data collected by both experienced and novice interpreters working with English-Ukrainian and Ukrainian-English language pairs. The corpus includes audio and video recordings of interpreting sessions in various fields, such as economics, law, and politics; interpreter notes and transcripts of source and target texts; as well as participants' demographic and professional data, including their experience, education, and language skills. The data encompasses both controlled experimental tasks and authentic interpreting scenarios, allowing for a deeper understanding of attentional dynamics under varying cognitive loads.

The study uses a *mixed methodological approach*, integrating both quantitative and qualitative methods to examine fluctuations in attention (attentional fluctuations) during consecutive interpreting:

1. An empirical analysis of attentional fluctuations is conducted using video recordings and eye-tracking data to monitor gaze changes, visual concentration, and time lapses, recognizing and systematically classifying fluctuations in attention across the listening, note-taking, and reformulation phases.

2. The analysis of the cognitive load on interpreters is assessed using subjective rating scales (NASA-TLX) and objective measures such as pauses, hesitations, and speech errors, with systematic study of correlations between cognitive load and fluctuations in attention.

3. Dilemma and decision-making analyses are conducted using analytical tools such as dilemma analysis matrices and SWOT-based models to simulate interpreters' decisions in real time under conditions of fluctuations in attention, Attention patterns are classified based on interpreter's experience, task complexity, and external distractions.

4. Statistical and comparative analyses are conducted using descriptive statistics, correlation analysis, and variance analysis. Differences in attention patterns between professional and novice interpreters are examined to determine their impact on interpreter training.

This methodological framework enables a comprehensive cognitive-empirical analysis of attentional dynamics, linking cognitive theory with interpreting practice and offering evidence-based recommendations for interpreter training programs.

Concepts of attention in Cognitive Psychology and Translatology

Attention is a key cognitive process, extensively studied in **psychology**. It involves selectively focusing mental resources on specific stimuli while ignoring irrelevant information. It plays a crucial role in effective perception, memory, learning, and task performance. Over the decades, cognitive psychologists have formulated several important models to explain the mechanisms and limitations of human attention, each offering a unique understanding of how attentional resources are filtered, distributed, and managed (Tab. 1).

Table 1

Influential Cognitive Models Explaining Attentional Processes

Model	Stage of Attention	Mechanism	Key Strengths	Limitations
Broadbent's Filtering Model (1958)	Early selection	Filter blocks irrelevant information	Explains selective attention in simple tasks	Cannot explain detection of salient unattended information
Treisman's Attenuational Model (1964)	Early selection with attenuation	Attenuator reduces unattended information	Accounts for "cocktail party effect"	Less quantitative, does not model resource allocation
Kahneman's Capacity Model (1973)	Resource allocation	Limited cognitive capacity distributed by task demands	Explains multitasking and cognitive load	Does not specify neural mechanisms
Posner's Attention Network Theory (1980s–1990s)	Network-based, distributed	Alerting, orienting, executive control networks	Integrates neural basis, explains complex task coordination	Requires neurophysiological tools to measure accurately

Broadbent's Filtering Model describes attention as a selective mechanism operating early in information processing. Incoming sensory data is initially filtered to determine relevance, and only the information that passes this filter enters the perceptual processing stage, where its meaning is determined [Broadbent, 1958; McLeod, 2023]. This early selection model clarifies how people *focus on relevant stimuli while ignoring distractions*. However, a significant limitation is revealed by the "cocktail party effect," where personally important information (such as a name heard) can be recognized even after filtering, suggesting that some unattended information can sometimes escape the selective filter.

Treisman's Attenuational Model addresses this issue by suggesting that unattended information is not entirely blocked but rather weakened, permitting partial processing and recognition of salient or personally meaningful stimuli. Treisman described this process as *Sensory Register → Attenuator → Perceptual Process → Conscious Perception*, where the attenuator reduces the intensity of unattended stimuli without eliminating them completely [Treisman, 1964]. This model offers a more flexible explanation of selective attention, accounting for phenomena such as the perception of personally meaningful cues.

Kahneman's Capacity Model redirects attention from filtering processes to the allocation of limited attentional resources. Attention is viewed as a finite cognitive resource that needs to be distributed according to task demands, motivation, and arousal [Kahneman, 1973; Bruya, Tang, 2018]. When multiple tasks compete for the same resources, this can lead to decreased performance, highlighting the tradeoffs associated with multitasking. Kahneman's model focuses on managing mental effort and workload, offering a practical framework for understanding attention in complex, demanding and resource-intensive situations.

Posner's Attention Network Theory is a neurocognitive concept, suggesting that attention consists of three interrelated networks: a *vigilance network* that enhances general arousal; an *orienting network* that focuses attention on specific stimuli; and an *executive control network* that monitors and resolves conflicts between competing information. These networks, with support from the parietal and frontal lobes, enable complex cognitive operations, multitasking, and flexible allocation of attention [Posner, Petersen, 1990]. Posner's model emphasizes the interaction between cognitive processes and neural mechanisms, providing a detailed understanding of how attention is managed during complex tasks, such as interpreting.

Together, these theories offer complementary perspectives: Broadbent and Treisman clarify how attention filters sensory information, Kahneman focuses on resource allocation under cognitive load, and Posner integrates neural structures with attentional control, providing a comprehensive understanding of attention in both simple and complex tasks.

In the fields of cognitive translatology, and interpreting in particular, attention is widely recognized as a crucial cognitive element influencing comprehension, working memory, and the accuracy of linguistic output. Both theoretical and empirical research highlight several critical functions of attention in professional translation and interpreting, including maintaining focus for accurate listening and comprehension, dynamically distributing cognitive resources for working memory and note-taking, and splitting attention to effectively manage reformulation, linguistic accuracy, coherence, and audience control during speech.

During ***listening and understanding*** speech, the ability to maintain sustained and selective attention is vital for the accurate interpreting and processing of information in the source language. Psychological theories, such as Broadbent's Filtering Model and Treisman's Attenuation Model, suggest that attentional mechanisms selectively prioritize relevant auditory information while filtering out or reducing irrelevant stimuli. To listen effectively, interpreters must constantly monitor linguistic cues, identify semantic and syntactic structures, and integrate them into working memory, while minimizing distractions. Research in cognitive linguistics shows that the allocation of attentional resources during listening directly influences the accuracy of comprehension and the ability to predict subsequent speech fragments.

Actively distributing attention is crucial, especially when ***note-taking*** and engaging ***working memory***. Linguists must simultaneously encode new information, store it in memory, and systematically organize it for later reproduction. As Kahneman's Capacity Model points out, our attentional resources are limited and must be allocated wisely to prevent cognitive overload. Complex or dense texts complicate cognitive tasks, requiring prioritization of key elements. Research using eye-tracking and neurocognitive methods shows that effective note-taking techniques, such as segmenting information or using symbols, improve attentional control and promote working memory retention.

The process of ***reformulation*** and ***speech generation*** relies heavily on divided attention, as interpreters must manage several simultaneous tasks. These tasks include maintaining linguistic accuracy, ensuring coherence in the target language, and monitoring audience response. Posner's Attention Network Theory provides a useful framework for understanding these processes: the executive control network deals with conflicts between competing language options, the orienting network focuses attention on important elements, and the vigilance network maintains overall alertness and vigilance. Successful reformulation requires the smooth integration of these networks, highlighting the connection between cognitive regulation, language processing, and attentional flexibility in professional translation and interpreting.

The integration of these theoretical models allows translation research to reveal that attention is not merely a fixed resource, but a dynamic and context-dependent process. Analyzing fluctuations in attention during listening, memorization, and rendering provides a solid foundation for detailed research in translation and interpreting. Understanding how attention is distributed, the cognitive load involved, and how mental resources are managed allows researchers to identify vulnerabilities, assess how experience and training influence attentional stability, and develop evidence-based strategies for improving effectiveness.

These results highlight the importance of attentional control in translation and interpreting and guide the development of training programs aimed at improving cognitive control, efficiency, and the quality of language production. This study, which bridges cognitive psychology and cognitive translatology, enriches our comprehension of the relationship between language processing, attentional control, and the cognitive challenges that arise in professional language work.

Models of consecutive interpreting in cognitive aspects

Based on the understanding of attention as a dynamic, context-dependent cognitive process, it becomes essential to examine how attentional mechanisms interact with other cognitive functions, such as perception, working memory, and executive control, during interpreting. **Consecutive** interpreting represents one of the most cognitively demanding forms of bilingual language processing, requiring the constant coordination of comprehension, memory storage, and speech production under strict temporal and contextual constraints. To understand these complex mental operations, several cognitive models have been proposed to explain the structure and functioning of interpreting processes.

One of the most influential frameworks is *Gile's Effort Model*, which characterizes interpreting as the management of several simultaneous processes: *listening and analyzing*, *working memory*, *production*, and *coordination*. Each of these activities consumes limited cognitive resources, and the quality of interpreting depends on the interpreter's ability to effectively balance them [Gile, 2021]. In consecutive interpreting, attentional resources are primarily distributed between comprehension and note-taking during the first phase, and between retrieving information from memory and speech reformulation during the second phase. According to Gile, performance breakdowns or inaccuracies often arise from cognitive overload, when the overall workload exceeds available capacity. Thus, this model directly links the distribution of attention and the management of working memory with the quality and fluency of interpreting output.

Further development of cognitive models was advanced by *Moser-Mercer* and *Pöchhacker*, who emphasize the interactive and adaptive nature of interpreting as a *real-time decision-making process*. Moser-Mercer's model integrates psycholinguistic concepts, highlighting how interpreters consistently monitor incoming information, modify comprehension strategies, and manage shifts in attention between linguistic and extralinguistic elements [Moser-Mercer, 2000]. Similarly, Pöchhacker views interpreting as *a multimodal cognitive system*, in which attentional control regulates the dynamic interaction of perception, memory, and production subsystems [Pöchhacker, 2005]. Both researchers stress that flexibility of attention, rather than its fixed capacity, is critical for maintaining the stability of performance.

Seeber's Cognitive Load Model expands on these ideas by quantifying the interaction of competing tasks (listening, note-taking, speech planning) within a shared resource framework [Seeber, Kerzel, 2012]. His neurocognitive approach incorporates dual-task paradigms and eye-tracking data to demonstrate how interpreters manage overlapping information-processing demands. The model distinguishes between automatic and controlled processes, suggesting that with experience and training, lower-level decoding and encoding tasks become more automatic, allowing attentional resources to be redirected to the higher-level monitoring and reformulation.

Furthermore, *Setton's Cognitive-Pragmatic Model* offers a comprehensive perspective that places interpreting within a broader communicative and contextual framework. It emphasizes the interpreter's ability to manage pragmatic relevance, determine the speaker's intentions, and maintain discourse coherence—responsibilities that rely heavily on selective attention and executive control [Setton, 1999; Maalej, 2001]. This model highlights the two-way nature of cognitive processes: while attention facilitates comprehension and production, pragmatic reasoning guides the application of attentional focus.

Darò and Fabbro's Psycholinguistic Model further deepens the cognitive approach to interpreting by emphasizing the temporal sequencing of mental operations and the interaction between language comprehension, working memory, and speech production [Darò & Fabbro, 1994; Christoffels, De Groot, 2005, p. 462]. According to this model, interpreting is a time-sensitive process in which the interpreter must effectively synchronize various overlapping stages of cognitive activity. It highlights that successful performance depends on maintaining continuity of attention and integrating memory traces across the listening, retention, and reformulation stages.

In contrast to static models that describe the distribution of cognitive load in general terms, Darò and Fabbro propose viewing interpreting as a *temporal continuum,* in which the attentional focus dynamically shifts between processing input information and output planning. During the comprehension phase, selective attention and linguistic decoding occur almost simultaneously, transferring information to working memory for temporary storage. This stored information must then be actively maintained and reorganized during the retention phase before being converted into the target-language through reformulation.

The model also reveals the neurocognitive foundations of interpreting, suggesting that successful performance depends on effective interhemispheric communication and synchronized activation of networks responsible for language, memory, and executive functions. These observations anticipated future neuroimaging studies that confirmed the distributed neural structure of interpreting, involving the prefrontal cortex, inferior parietal regions, and temporal areas associated with bilingual language control.

Within the broader context of interpreting models, the psycholinguistic model proposed by Darò and Fabbro links *temporal process models,* which emphasize real-time sequencing, with *capacity models*, which focus on resource distribution. Thus, it offers a valuable perspective on how sustained attention and memory integration ensure a smooth transition between listening, storing, and reformulation – the three phases that characterize the effectiveness of consecutive interpreting.

The presented models (Tab. 2) demonstrate that attention functions as a key regulatory mechanism in the cognitive structure of interpreting. From a pedagogical and empirical perspective, understanding these models provides a theoretical basis for studying fluctuations in attention and creating training programs that improve interpreters' cognitive control, their multitasking skills, and their ability to cope with stress caused by a high workload.

Table 2

Theoretical Models of Consecutive Interpreting: Cognitive Mechanisms and Attentional Dynamics

Scholar / Model	Core Concept	Key Cognitive Components	Attentional Implications	Practical Relevance
Gile's Effort Models	Interpreting consists of several concurrent "efforts" – listening and analysis, memory, production, and coordination.	Listening comprehension, short-term memory, reformulation, coordination.	Limited cognitive resources must be balanced; overload occurs when total demand exceeds capacity.	Highlights cognitive strain; basis for training in resource allocation and attentional control.
Moser-Mercer's Cognitive Load Approach	Interpreting as continuous monitoring and adaptive management of cognitive load.	Working memory, monitoring, adaptive control.	Attention must flexibly shift between comprehension, note-taking, and reformulation.	Emphasizes metacognitive strategies for balancing attentional focus.
Pöchhacker's Process-Oriented Model	Interpreting as a multimodal cognitive system combining linguistic and cognitive dimensions.	Perception, memory, production subsystems, decision-making.	Attentional control governs interaction among subsystems to sustain coherence and fluency.	Promotes awareness of dynamic attentional regulation during performance.
Seeber's Cognitive Load Model	Quantifies interaction between concurrent interpreting tasks within shared cognitive resources.	Dual-task coordination, automatic vs. controlled processing.	Attention divided across overlapping tasks (listening, note-taking, speech planning).	Explains performance variation via cognitive load; supports neurocognitive training design.
Setton's Cognitive-Pragmatic Model	Integrates cognitive and pragmatic dimensions within a communicative framework.	Pragmatic inference, discourse coherence, executive control.	Attentional selectivity guided by pragmatic relevance and communicative intent.	Encourages contextual and discourse-sensitive attentional strategies.
Darò & Fabbro's Psycho-linguistic Model	Emphasizes temporal sequencing of comprehension, retention, and reformulation.	Language comprehension, working memory, speech production.	Continuous attention and memory integration across phases; dynamic focus shift between input and output.	Links neurocognitive sequencing with attentional continuity for effective performance.

Overall, models of consecutive interpreting illustrate the complex interaction of attention, working memory, and executive control in determining interpreter's effectiveness. They highlight that interpreter's competence extends beyond mere linguistic ability, and includes a highly developed ability to manage cognitive resources. By integrating findings from cognitive psychology with translation research, ongoing research continues to refine these models, providing a more precise understanding of neurocognitive structure, its significance, and its impact on professional training and performance assessment.

Concept of fluctuations in attention

Fluctuations in attention refer to short-term fluctuations in concentration, intensity, or distribution of attentional resources, characterized by brief shifts from a primary stimulus and subsequent returns to it, rather than a constant, sustained focus. The degree and duration of these fluctuations can be influenced by factors such as physical or mental exhaustion, decreased interest, distraction, and innate neurocognitive limitations, often resulting in noticeable changes in performance [Adam, deBettencourt, 2019]. In the context of consecutive interpreting, fluctuations in attention significantly impact the interpreter's ability to perceive, process, remember, and accurately reproduce source-language information, highlighting their crucial role in cognitive efficiency and translation quality.

In psychology, it is important to distinguish between *fluctuation in attention* and *distraction*, as these phenomena have different origins and influence cognitive processing differently. Attention serves as the selective mechanism by which a person focuses on a limited set of stimuli from the many surrounding them. According N. Munn, attention involves focusing a small number of stimuli on a central focus of consciousness, ignoring the many others around us [Abramson, 2022]. Attention is shaped by objective factors, such as the intensity, size, or movement of stimuli, as well as subjective factors, including interest, motivation, and mental state.

Distraction occurs when the focus of attention shifts from the primary stimulus to another due to various external or internal factors. External distractions may include sudden loud sounds, movements, or new stimuli, while internal distractions can be caused by fatigue, lack of interest, or intrusive thoughts [Slaughter, 1901]. For example, while studying, a doorbell might cause a person to answer the door (a typical example of distraction). A person's ability to refocus on the original stimulus after a distraction can depend on both the person and the situation.

In contrast, fluctuation in attention refers to temporary, short-term changes in the focus or intensity of attention while maintaining focus on the primary stimulus. These fluctuations are primarily caused by innate human cognitive limitations, such as mental fatigue or a temporary loss of concentration [Slaughter, 1901]. For example, when reading a complex text, a person's thoughts may momentarily wander, but then refocus on the text, which is a manifestation of a natural fluctuation in attention. Unlike distraction, attentional fluctuations are typically short-lived and do not entail a complete switch to the external stimulus.

To summarize, *fluctuation in attention* reflects a short-term, internally determined change in focus that can occur even while performing the primary task, whereas *distraction* refers to a shift in attention—caused by both external and internal factors—from the primary task. Although attentional fluctuations are generally unavoidable, reducing distractions is essential for maintaining sustained attention and optimizing cognitive performance. In interpreting and other cognitively demanding activities, these fluctuations in attention can significantly influence both the accuracy of performance and the efficiency of information processing.

Bringing together key ideas from capacity-based models of attention [Kahneman, 1973], theories of attentional control and orienting [Posner, 1980], multiple resource theory [Wickens, 2008], and Gile's Effort Model of interpreting [Gile, 1995], as well as studies on the affective modulation of cognition [Lazarus, 1991; Csikszentmihalyi, 1990], attentional variability can be classified into several principal types.

1. Temporal Fluctuations denote short-term increases or decreases in attentional focus over short periods of time. These changes are often associated with task complexity*, mental* exhaustion, or *cognitive* overload, which can lead to temporary lapses in concentration or reduced information processing efficiency.

2. Spatial Fluctuations are shifts in attentional focus between different sources of perception or information. In the context of interpreting, this may mean switching attention between *the speaker*, *visual materials*, and *the interpreter's notes*, reflecting the interpreter's need to dynamically manage attention, distributing it across different input channels.

3. Task-Related Fluctuations occur when switching between different cognitive operations such as *listening*, *note-taking*, *retrieving information from memory*, and *speech reformulation*. These fluctuations in attention indicate a redistribution of attentional resources as interpreters shift from comprehension to information production.

4. Emotional or Motivational Fluctuations arise from emotional states and motivational factors, such as *stress*, *anxiety*, or *interest* in the material being interpreted. Emotional reactions can either facilitate or hinder attentional stability, depending on the nterpreters' ability to self-regulate and their awareness of the situation.

Fluctuations in attention arise from a complex interaction of cognitive, physiological, environmental, and individual factors that influence the persistence of mental focus during complex tasks. In situations requiring significant cognitive effort, such as interpreting, even short-term fluctuations in attention can affect comprehension, retention of information, and overall performance [Gile, 2002; Denfield et al., 2018; Christoffels, De Groot, 2009]. The main causes of these fluctuations can be summarized as follows: cognitive overload, mental fatigue, external distractions, emotional and physiological stress, motivational decline, task monotony or complexity.

A key factor affecting sustained attention is the level of cognitive load required to complete the task. When interpreters encounter high information density, rapid speech, or specialized terminology, the demands on working memory and text comprehension increase significantly. As the cognitive system reaches its limits, attentional control becomes more vulnerable, resulting in temporary lapses, slower information processing, or missed details.

Prolonged cognitive effort, especially under time pressure or high-stakes situations, can lead to both mental exhaustion and physiological stress. These conditions impair executive functions that regulate attention, reducing the ability to maintain concentration and resist distractions. Long interpreting sessions or emotionally charged content can thus lead to decreased vigilance, reduced responsiveness to stimuli, and increased error rates.

Both external distractions, such as background noise, audience movement, or visual clutter, and internal distractions, including intrusive thoughts, emotional reactions, or self-control, can temporarily divert cognitive resources from the primary task. Such distractions fragment the continuity of attention and disrupt the smooth integration of auditory information, memory processing, and verbal output.

Finally, the susceptibility to fluctuations in attention varies among individuals. Factors such as ***experience***, ***working memory capacity***, ***cognitive flexibility***, and ***attentional control strategies*** can significantly influence performance. Experienced interpreters tend to exhibit more efficient resource management and greater tolerance for distractions, while novices may experience greater difficulty under cognitive pressure.

Overall, fluctuations in attention reflect the dynamic nature of cognitive resource management, where internal constraints and external factors constantly interact to influence performance. Understanding the characteristics, types, and underlying causes of fluctuations in attention is crucial for developing effective interpreter training programs that foster cognitive resilience, optimize cognitive load, and enhance performance in consecutive interpreting practice, particularly in consecutive interpreting.

Cognitive-empirical analysis of attentional fluctuations during consecutive interpreting

This analysis allows for an in-depth study of how interpreters' attention fluctuates at every stage during the consecutive interpreting process. Using a structured, multi-stage methodology, this analysis records, classifies, and analyzes both behavioural and cognitive indicators to determine when, how, and why shifts in attention occur at different stages of consecutive interpreting and among different groups of participants.

In the **first stage**—Identification of Fluctuation Intervals—fluctuations in attention are compared with individual temporal phases of interpreting: the *Listening / Comprehension Phase*, during which the interpreter assimilates incoming speech; the *Note-Taking / Retention Phase*, where attention is divided between listening and recording key information; and the *Reformulation / Speech Generation Phase*, during which previously processed information is restructured in the target language. Segmenting consecutive interpreting in this way allows for the precise identification of temporary lapses in attention and their association with specific interpretive tasks.

The **second stage**—Behavioural and Verbal Coding—systematically records observable indicators of fluctuations in attention, including both visual and verbal ones. These indicators include *gaze shifts* (changes in visual attention), *hesitations* (short pauses indicating cognitive overload), *pauses* (longer breaks during any phase), and *repetitions* (repetition of fragments to restore partially lost information). This structured coding ensures objective and comparable data across interpreters.

In the **third stage**—Quantitative and Qualitative Analysis—the frequency, duration, and timing of fluctuations in attention are measured quantitatively, while the qualitative analysis examines the contextual elements and interpreters' strategies for coping with these fluctuations, such as information segmentation techniques; compression and summarization techniques; anticipation strategy; reformulation and paraphrasing techniques**;** multitasking and divided attention techniques; and note-taking techniques, and others [Boiko, 2025, p. 32–38]. These combined analyses provide a comprehensive understanding of the dynamics associated with attentional control during consecutive interpreting.

Typical fluctuations in attention identified using this framework include *short-term distractions*, brief lapses due to environmental or internal factors; *delays*, indicating temporary processing slowdowns or cognitive overload; and repetitions, instances where the interpreter rephrases the content to restore comprehension.

Overall, this cognitive-empirical framework integrates temporal mapping, behavioural coding, and mixed-methods analysis to reveal the complex nature of attentional control during consecutive interpreting. By linking observed behaviour to underlying cognitive processes, it provides a detailed understanding of how interpreters manage attention across different speaking rates, cognitive loads, and task complexity. To further explore contextual variations, this approach identifies three main scenarios of consecutive interpreting process—High-Load, Interruptions, and Conflict-Ridden Note-Taking, which are analyzed using multimodal data triangulation that includes eye-tracking, video, and audio recordings.

High-Load Scenario. Characterized by *rapid source speech* and an abundance of *specialized terminology*, this scenario assesses the interpreter's ability to maintain both selective and divided attention while ensuring accurate comprehension and memory integration (Tab. 3).

Table 3

High-Load Scenario: Fluctuations in Attention Patterns and Coping Strategies

Factors	Identification of Fluctuation Intervals	Typical Fluctuations in Attention	Behavioural and Verbal Coding	Quantitative Analysis	Qualitative Analysis
Highly technical or abstract content.	*Listening / Comprehension Phase* – while interpreting intricate terminology, complex clauses, or abstract concepts.	Momentary lapses, difficulty in integrating information, divided attention.	Gaze shifts away from speaker or source text; brief pauses; repeats for clarification	Frequency and length of lapses during processing technical or abstract content	*Segmenting Information Technique, Compression and Summarization Technique.*
Rapid speech (180–220 words per minute).	*Listening / Comprehension & Note-Taking Phases* – during quick-paced presentations.	Pauses, omitted words, brief attentional drops.	Hesitations, repeated words or phrases, shortened phrases.	Count of omitted words, pauses, or timing of attention drops.	*Anticipation Strategy, Reformulation Technique*
Simultaneous listening, processing, and output strain working memory.	*Note-Taking / Retention & Reformulation Phases* – when managing multiple tasks.	Short-term attention drops, temporary disengagement, cognitive overload.	Pauses, fragmented responses, repeated sections.	Duration and frequency of attention drops due to multitasking.	*Multi-Tasking and Split Attention Technique, Note-Taking Technique.*

For example, when interpreting a technically complex statement such as “*Implementing multi-factor authentication, endpoint monitoring, and real-time threat intelligence will reduce the risk of breaches by 40% in the next financial year*,” the interpreter might experience a brief fluctuation in attention. While simultaneously listening to the source speech and transcribing notes, the interpreter spends a short time processing and encoding complex terms such as “endpoint monitoring” and “real-time threat intelligence.” This minor cognitive disruption results in a temporary interruption in the smooth flow of interpreting, as working memory is momentarily strained by the simultaneous tasks of auditory processing and manual note-taking. Immediately afterward, the interpreter smoothly continues with the interpretation, effectively managing the challenge of divided attention. These attentional fluctuations illustrate how divided attention and task prioritization influence performance under the high workload associated with note-taking, highlighting the importance of managing cognitive load without compromising comprehension accuracy.

High-Load Scenario shows how text complexity, speech rate, and cognitive load affect interpreters’ performance, highlighting how these factors influence attention, accuracy, and decision-making in real-time conditions.

Interruptions Scenario. This scenario involves *unexpected external or internal distractions*, such as sudden background noise, phone notifications, or brief lapses in concentration. The aim is to study mechanisms of attentional recovery and measure the time required to restore cognitive focus during ongoing interpretation (Tab. 4).

Table 4

Interruptions Scenario: Fluctuations in Attention Patterns and Recovery Strategies

Factors	Identification of Fluctuation Intervals	Typical Fluctuations in Attention	Behavioural and Verbal Coding	Quantitative Analysis	Qualitative Analysis
Complex or specialized material.	*Listening / Comprehension Phase* – immediately following an unexpected distraction.	Brief lapses, missed clauses, missed phrases, momentary loss of semantic coherence.	Hesitations, pauses, brief omission of terms or jargon.	Measure frequency and duration of missed or partially understood content.	*Memory Retention Technique*, *Segmenting Information Technique.*
Rapid delivery leaves little time to “catch up”.	*Listening / Comprehension & Note-Taking Phases* – during and immediately after fast speech.	Skipped terms, temporary attention drops, partial understanding.	Short pauses, repetitions, shortened phrasing.	Count skipped terms or delayed reactions; timing of recovery post-interruption.	*Anticipation Strategy*, *Restructuring Technique.*
Quickly shifting attention between distraction and speech.	*Note-Taking / Retention & Reformulation Phases* – while dividing attention between the source speech and the distraction.	Temporary disengagement, sudden cognitive overload, fragmented output.	Pauses, hesitations, repeated phrases, rewording to correct mistakes.	Duration and frequency of attention shifts, recovery duration.	*Compression and Summarization Technique*, *Use of Cognates and Familiar Phrases.*

For example, during live interpreting, the spoken message included a complex, technically rich message with embedded clauses, requiring the interpreter to quickly reorganize information while simultaneously coping with sudden interruptions: *Given the accelerating pace of digital transformation across various sectors, it is crucial that organizations not only integrate adaptive technologies into their operational structures but also develop a culture of continuous learning to maintain long-term competitiveness.* The interpreter actively processed and integrated numerous technical terms, ensuring comprehension and being prepared for immediate reformulation.

At that moment, someone in the audience suddenly cleared their throat. This unexpected distraction momentarily caught the interpreter's attention, causing a slight hesitation and a slight disruption in the flow of interpreting. For a few seconds, the interpreter's cognitive resources were divided between processing the interruption and storing previously encoded technical information.

Almost immediately, the interpreter switched back to the original message, quickly reconfiguring working memory, and continued interpreting without losing semantic accuracy. This case illustrates how brief shifts in attention caused by external distractions, can temporarily impact interpreting quality; however, experienced interpreters are able to quickly recover, reactivating their working memory, maintaining the integrity of complex terminology, and ensuring the overall consistency of the interpreting.

The impact of text complexity, speech rate, and cognitive load on interpreters' performance is significant in Interruptions Scenario: highly complex or technical content requires rapid semantic processing, high speech rates require immediate syntactic analysis and integration, and higher cognitive load forces interpreters to simultaneously listen, encode, store, and reformulate information, increasing the likelihood of fluctuations in attention and brief lapses in comprehension.

Conflict-Ridden Note-Taking Scenario. This scenario demonstrates the the *conflict between processing audio information and taking written notes*, revealing how interpreters prioritize tasks and manage divided attention while simultaneously listening and writing. (Tab. 5).

Table 5

**Conflict-Ridden Note-Taking Scenario:
Phases of Attentional Shift and Compensation Techniques**

Factors	Identification of Fluctuation Intervals	Typical Fluctuations in Attention	Behavioural and Verbal Coding	Quantitative Analysis	Qualitative Analysis
Complex content complicates the accurate capturing of essential points.	*Listening / Comprehension & Note-Taking Phases* – while interpreting complex sentences or specialized terminology.	Short-term attention drops, partial understanding, challenge in identifying key points.	Hesitations, pauses, fragmented or incomplete notes.	Measure frequency and length of comprehension lapses or incomplete notes.	*Segmenting Information Technique, Compression and Summarization Technique.*
Rapid speech limits the time available for simultaneous note-taking and understanding.	*Listening / Note-Taking Phase* – during quick-paced delivery.	Brief lapses, omitted terms, delays in completing note.	Pauses, repeated terminology, incomplete notation.	Count omitted words/phrases, timing of note-taking against the speech.	*Ear-Voice Span (EVS) Management Technique, Selective Summarization Technique.*
Simultaneously listening and writing overloads memory, impairing understanding and recall.	*Note-Taking / Retention & Reformulation*– while managing auditory input and manual transcription.	Temporary disengagement, cognitive overload, fragmented outputs.	Pauses, hesitations, corrections, repeated phrases, fragmented sentences.	Measure duration and frequency of attention shifts; number of errors in output.	*Restructuring Technique, Memory Retention Technique.*

For example, attention may fluctuate when the speaker states, "*The revised sustainability framework—integrating carbon offsetting measures, renewable energy sources, and life-cycle impact assessments—aims to achieve full compliance with EU environmental standards by 2030*." During the recording, the interpreter briefly focuses on noting "renewable energy sources" and "life-cycle impact assessments," leading to a slight omission or delay in the following phrase, "full compliance with EU environmental standards," which impedes comprehension and further transcription.

In a Conflict-Ridden Note-Taking Scenario, interpreters experience cognitive overload due to the combination of complex text, rapid speech, and the need to perform dual tasks.

Complex source material, such as multi-clause sentences, specialized terminology, or dense ideas, requires careful analysis and semantic integration, increasing mental effort. When speaking quickly, interpreters have limited time to process information, forcing them to prioritize what needs to be immediately encoded, condensed, or made educated guesses. At the same time, listening and writing create a double workload, dividing attention between understanding auditory information, storing it in memory, and transcribing notes. This often leads to time lapses, omissions, or incomplete notes. All these factors combine to create a stressful environment in which maintaining accurate, continuous, and effective note-taking requires rapid task-switching, the use of anticipatory strategies, and careful management of working memory.

Overall, managing a Conflict-Ridden Note-Taking Scenario requires interpreters to dynamically balance their attention between listening, note-taking, and reformulation, ensuring accuracy and consistency in complex situations.

Fluctuations in attention during consecutive interpreting arise from the interaction of cognitive, emotional, and contextual factors. A key factor is **cognitive load**: processing dense or complex content, including extensive information, specialized terminology, complex sentences, or rapid speech, significantly strains working memory. Interpreters must encode meaning, retain several clauses in memory, update existing information, and simultaneously prepare their output, which can lead to errors due to memory overload or recall of previous material.

Task-switching and divided attention further intensify fluctuations. Interpreters constantly shift between listening, decoding, storing information, note-taking, and formulating their output. This dual-task management can temporarily reduce comprehension, lead to hesitations, or result in fragmented notes, especially when attention is divided between auditory processing and manual transcription. Motor-cognitive interference—the competition between hand movements and mental processing—can also cause brief lapses in flow.

Fluctuations in prediction and anticipatory pressure are also significant factors. Encountering unfamiliar or unexpected terminology, rapid changes in speech patterns, or complex syntax can disrupt anticipatory strategies, forcing interpreters to instantly adjust. Such interruptions often lead to momentary lapses of attention and increase the mental effort required to re-gather information.

Emotional and psychological factors also affect attention stability. Stress, fatigue, anxiety about accuracy, performance pressure, or a sense of loss of control can increase sensitivity to distractions and slow recovery from errors. Over-focusing on missed information can lead to a series of subsequent mistakes, and decreased confidence may affect both comprehension and the quality of notes.

Finally, **external (environmental) factors,** including background noise, sudden movements, phone notifications, or visually compelling stimuli, can briefly distract attention and compete for limited cognitive resources. Interpreters must manage these situational challenges while maintaining semantic integrity and efficiency. Strategic approaches, such as selective abbreviation, chunking, or intentional pauses in note-taking, can also temporarily divert attention from listening, demonstrating the delicate balance required for accurate and uninterrupted interpreting.

Overall, fluctuations in attention reflect the complex, multifaceted nature of real-time interpreting, which is influenced by cognitive load, divided attention, predictive difficulties, emotional stress, and external (environmental) factors. Successful interpreting requires adaptive strategies for maintaining focus, managing memory, and flexibly responding to dynamic conditions.

Each scenario of consecutive interpreting process is analyzed through ***temporal segmentation*** and the ***triangulation of multimodal data***, allowing for detailed mapping of fluctuations in attention and the distribution of cognitive effort (Tab. 6). Behavioural indicators such as ***gaze duration***, ***hesitation frequency*****, and** ***speech pauses*** are systematically coded and measured, providing a detailed understanding of fluctuations in attention trends across different levels of experience.

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Table 6

Cognitive-Empirical Framework for Fluctuations in Attention in Scenarios of Consecutive Interpreting Process

Temporal Segmentation	Scenarios		
	High-Load Scenario (Rapid speech, intricate terminology)	**Interruptions Scenario (Sudden distractions)**	**Conflict-Ridden Note-Taking Scenario (Simultaneous listening & writing)**
Listening / Comprehension Phase.	*Behavioural Metrics*: gaze fixation, eye-tracking heatmaps *Cognitive Load*: initial comprehension delays *Quantitative*: frequency of gaze shifts.	*Behavioural Metrics*: startled gaze change, pause onset *Cognitive Load*: disruption and recovery time *Quantitative*: reaction latency.	*Behavioural Metrics*: divided visual focus (speaker/notes) *Cognitive Load*: increased error rate *Quantitative*: task-switch frequency.
Note-Taking / Retention Phase.	*Behavioural Metrics*: Hesitations during recording *Cognitive Load*: due to dense input *Quantitative*: Frequency of missed segments.	*Behavioural Metrics*: Attention drop during external interruption *Cognitive Load*: Reorientation attempts *Quantitative*: Duration of pause.	*Behavioural Metrics*: Overlap between writing and listening *Cognitive Load*: Cognitive strain markers *Quantitative*: Proportion of delayed entries.
Reformulation/ Speech Production Phase.	*Behavioural Metrics*: Repetitions for lexical retrieval *Cognitive Load*: Processing delays *Quantitative*: Measured output disfluency.	*Behavioural Metrics*: Self-corrections after distraction *Cognitive Load*: Output pauses *Quantitative*: Recovery patterns.	*Behavioural Metrics*: Reconstruction of partial notes *Cognitive Load*: Hesitation clusters *Quantitative*: Output accuracy rate.

A Model of attentional control during consecutive interpreting

The model of attentional control during consecutive interpreting, which is called **Cognitive-Empirical Attentional Control Model** (CEACM) (Fig. 1), is based on the combination of cognitive-empirical observation and dilemma-based decision analyses. Linking observable cognitive and behavioural indicators with interpreters' decision-making processes, this model demonstrates how professionals manage competing cognitive demands, prioritize incoming information, and recover from fluctuations of attention in real time.

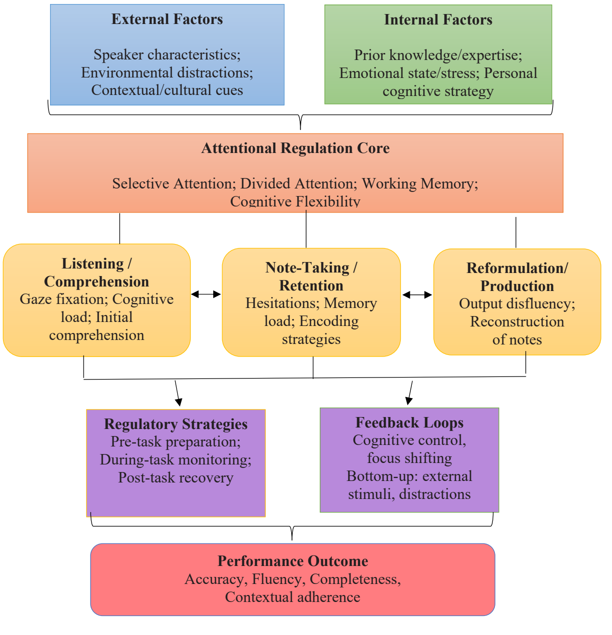

Fig. 1. *Cognitive-Empirical Attentional Control Model*

By linking cognitive translation research to interpreter training, CEACM provides both theoretical insight and practical implications for training. It systematically incorporates the stages of interpreting, basic cognitive dynamics, internal and external factors, and regulatory strategies, making it applicable to both experimental research and educational settings.

CEACM provides a comprehensive, dynamic framework for understanding attentional regulation throughout the interpreting process, emphasizing its complex and interactive nature. It integrates a range of external, internal, cognitive, and strategic factors, reflecting both the temporal phases of interpreting and the mechanisms of attentional control. Importantly, the model incorporates feedback loops that link performance to regulatory processes, illustrating the cyclical aspect of cognitive adaptation.

At the **highest level**, CEACM identifies external factors beyond the interpreter's direct control but that significantly influence attentional allocation. These factors include speaker's characteristics, such as speech rate, clarity, and style; environmental distractions, including noise and interruptions; and contextual or cultural cues present in the conversation. These elements serve as initial stimuli that direct the interpreter's focus and influence cognitive load, setting the basis for perceiving and processing information.

CEACM represents a complex, dynamic framework. Along with external factors, **internal factors** include the interpreter's personal qualities, background knowledge, and cognitive resources. This aspect encompasses experience, topic knowledge, emotional state, stress level, and individual cognitive strategies. These internal variables determine the interpreter's ability to perceive, filter, and prioritize incoming information, mediating the influence of external stimuli on attention and processing efficiency.

The core of CEACM is the cognitive mechanism **regulating attention**. This central mechanism coordinates selective attention, divided attention, working memory, and cognitive flexibility, integrating both external and internal factors. It governs the distribution of cognitive resources at all stages of interpreting, ensuring the interpreter's ability to manage competing demands, maintain concentration, and dynamically adapt to changing input.

The interpreting process can be viewed as a sequence of three interconnected stages. It starts with **listening and comprehension**, during which the interpreter listens to and decodes the source text. Attention is continuously assessed using factors such as gaze fixation, cognitive load, and comprehension latency, ensuring accurate processing of incoming information.

This is followed by the **note-taking and retention** stage, during which the interpreter records and organizes information for later use. During this stage, it is crucial to carefully balance memory load, potential interruptions during the task, and brief pauses to ensure continuity and coherence.

Finally, the process concludes with **reformulation and verbal rendering**, during which the interpreter reconstructs the message in the target language. This stage involves addressing gaps, filling in any omissions caused by incomplete notes, and ensuring accuracy, while maintaining the meaning, style, and contextual nuances of the original message.

To maintain optimal attention, interpreters employ various **regulatory strategies**, including pre-task preparation, in-task monitoring, and post-task recovery. These strategies help reduce cognitive overload, improve concentration, and ensure consistent delivery of accurate and fluent interpretation.

CEACM incorporates bidirectional **feedback mechanisms.** Top-down processes allow the interpreter to consciously adjust focus and resource allocation, while bottom-up processes respond to unexpected external stimuli. These feedback loops facilitate real-time adaptation, ensuring continuous optimization of attention and cognitive resources throughout the interpreting process.

CEACM results in measurable **performance indicators**, such as translation accuracy, fluency, completeness, and compliance with contextual and cultural standards. Importantly, these results provide feedback for further attentional adjustments, closing the loop and fostering continuous improvement. Through this dynamic interaction, CEACM accounts for the complexity, flexibility, and responsiveness inherent in professional interpreting.

Training strategies for attentional control and stress control

The last task of the study is to propose training strategies for attentional control and stress control based on the empirical results in order to improve both theoretical comprehension and practical development of interpreting skills.

1. Attentional Control Training Strategy incorporates practices aiming at improving focus stability, divided attention, and attentional recovery.

1.1. Selective Attention Practice

Objective: To develop interpreters' ability to focus on relevant auditory information while filtering out irrelevant noise or competing stimuli.

Description: In this practice, interpreters listen to two overlapping audio sources (e.g., two speakers talking simultaneously, or a news broadcast in the background). The task is to extract specific pieces of information—such as numbers, names, or key terms—from one target source while ignoring the other.

Training Focus:

- Improves auditory discrimination and selective attention.
- Strengthens the brain's ability to prioritize information while multitasking or in noisy environments.
- Develops resilience to external distractions, such as audience noise or simultaneous speech.

*Implementation***:** Listening to a news report and identifying all mentions of dates or organizations, while quiet background conversation occurs.

Reinforces attentional control techniques in High-Load and Interruptions Scenarios, where rapid information processing and filtering of information are essential.

1.2. Divided Attention Practice

Objective: To develop interpreters' skills necessary to perform two simultaneous cognitive tasks – listening and note-taking – while maintaining accurate comprehension.

Description: Participants listen to a short speech or lecture while taking structured notes. After completing the exercise, they use their notes to verbally or in writing recall the message.

Training Focus:

- Develops multitasking and information management under time pressure.
- Improves working memory retention with divided attention.
- Promotes the development of effective note-taking strategies that balance between speed and accuracy.

Implementation: Listening to a one-minute speech while noting down only key nouns and numbers, and then recalling it in full.

Directly addresses to Conflict-Ridden Note-Taking Scenarios, where interpreters must simultaneously manage auditory and manual input.

1.3. Attentional Restoration Practice

Objective: Develop skills for quickly reorienting after an interruption or distraction, ensuring minimal loss of information.

Description: During listening or interpreting, the trainer creates unexpected interruptions (e.g., a loud noise, a short irrelevant question, or a visual distraction). After each interruption, interpreters are required to quickly regain concentration and continue interpreting without interruption.

Training Focus:

- Increases cognitive flexibility and resilience.
- Improves the ability to "reset" attention after external or internal distraction.
- Reduces the time needed to restore attention.

Implementation: Playback a short fragment of speech, pausing in the middle to introduce a short unrelated noise, after which playback is resumed to assess how quickly the interpreter regains comprehension.

Based on Interruptions Scenarios, where interpreters encounter unexpected interruptions and must quickly regain their cognitive balance.

1.4. Chunking and Anticipation Practice

Objective: To improve interpreters' processing efficiency and predictive skills by training them to logically organize information and anticipate future content.

Description: This practice involves segmenting long sentences or speech fragments into manageable "chunks" according to their semantic or syntactic structure. Interpreters are also encouraged to predict what information might follow based on context and discourse patterns.

Training Focus:

- Improves comprehension and contextual anticipation.
- Improves memory encoding by grouping related information.
- Minimizes cognitive load when working with high-density segments.

Implementation: Listening to a complex political statement and breaking it down into logical chunks (e.g., "introduction – reason – effect – recommendation"), then immediately interpreting each chunk.

This practice is relevant in High-Load Scenarios, where the speed of speech and density of terminology test the interpreter's ability to process information.

2. Stress Control Training Strategy incorporates practices focusing on reducing physiological and emotional pressures that distract attention.

2.1. Breathing and Grounding Practice

Objective: To regulate physiological responses to stress and prevent lapses in attention caused by tension or anxiety.

Description: Before or after an interpreting session, interpreters perform controlled breathing practices, such as diaphragmatic breathing, block breathing (inhale-hold-exhale-hold), or brief mindfulness grounding breathing. These practices help regulate heart rate and oxygen flow, creating a calm state of mind that promotes attention and memory recall.

Training Focus:

- Reduces physiological stimulation and mental exhaustion.
- Improves self-awareness and the ability to control attention.
- Promotes a smoother transition of attention between different stages of interpreting.

Implementation: Take three deep, measured breaths before beginning consecutive interpreting or perform a one-minute mindfulness refresher during longer sessions.

This is helpful in all situations, especially during High-Load and Interruptions when stress-induced disruptions can impair cognitive control.

2.2. Cognitive Reframing Practice

Objective: To increase psychological resilience and reduce anxiety by transforming negative or self-critical thoughts into positive, confidence-building affirmations.

Description: Interpreters are trained to recognize stress-inducing thoughts ("I can't keep up", "I'll forget everything") and replace them with realistic, task-oriented affirmations ("I can focus on key points", "I can control my pace"). This cognitive shift minimizes emotional interference and improves attentional stability in challenging situations.

Training Focus:

- Increases mental flexibility and self-confidence.
- Minimizes fluctuations in attention caused by anxiety.
- Promotes self-discipline and positive attitude toward results.

Implementation: Maintaining a "stress reflection log" in which interpreters record moments of anxiety and consciously rephrase them in a positive light.

This practice is relevant in Conflict-Ridden Note-Taking and High-Load Scenarios, where cognitive overload may increase self-doubt and emotional strain.

2.3. Simulation-Based Stress Control Practice

Objective: To develop adaptive coping strategies and increase resilience to stress experienced during interpreting in real-world settings.

Description: Interpreters participate in practical sessions simulating stressful situations, such as rapid speech (over 200 words per minute), strict time constraints, background distractions, or a simulated live audiences. This gradual exposure trains interpreters to maintain composure, manage divided attention, and maintain cognitive function under external pressure.

Training Focus:

- Improves stability under stress.
- Improves attentional endurance and the ability to recover from errors.
- Prepares interpreters for work in realistic settings.

Implementation: Conducting simulated interpreting sessions in front of colleagues or with controlled breaks, recorded for subsequent feedback.

This practice is linked to High-Load and Interruptions Scenarios, where interpreters are required to deliver effectively in challenging, unpredictable contexts.

2.4. Biofeedback Practice

Objective: To provide interpreters with the ability to monitor their physiological and attentional states in real time, facilitating self-control and precise management.

Description: Using biofeedback tools, such as heart-rate monitors, eye-tracking systems, or EEG sensors, interpreters can visualize the impact of stress on their attention patterns. Monitoring these indicators allows them to consciously adjust breathing, posture, or concentration in response to physiological changes.

Training Focus:

- Improves understanding of the mind-body connection during interpreting.
- Provides measurable feedback for self-improvement.
- Improves the interpreter's ability to independently control stress.

Implementation: The interpreter uses a heart rate monitor to monitor changes in heart rate, followed by changes in breathing or posture to stabilize these readings.

This practice is beneficial for all scenarios of consecutive interpreting process (High-Load, Interruptions, and Conflict-Ridden Note-Taking), linking cognitive load, stress, and attentional fluctuations.

Conclusions

This study reconceptualizes attention in consecutive interpreting as a dynamic, self-regulating cognitive-empirical mechanism rather than a static or exhaustible resource. The proposed Cognitive-Empirical Attentional Control Model (CEACM) constitutes the central theoretical and methodological innovation of the research. Unlike existing effort- or load-based models, CEACM explicitly integrates empirical indicators of attentional fluctuations with cognitive (decision-making) and regulatory mechanisms, allowing attention to be examined as a process of continuous adaptation under variable cognitive load.

The novelty of the model lies in its three-stage architecture of attentional regulation—anticipatory control, active coordination, and restorative regulation—which captures how interpreters proactively prepare for cognitive load, dynamically redistribute attention during task execution, and rapidly restore concentration following overload or disruption. This triadic structure explains not only where and when attentional breakdowns occur, but also how experienced interpreters compensate for them in real time, preserving coherence and communicative adequacy.

Empirical evidence from three main scenarios of consecutive interpreting process—High-Load, Interruptions, and Conflict-Ridden Note-Taking—demonstrates that attentional fluctuations are not merely indicators of cognitive failure but function as signals that trigger compensatory strategies. Within CEACM, such fluctuations activate strategic mechanisms including chunking, anticipatory inference, selective omission, compression, and controlled pauses. These strategies operate as attention-concentration mechanisms, enabling interpreters to stabilize performance despite excessive speech rate, informational density, multitasking demands, or external distractions.

The findings substantiate the view that attentional control is adaptive and trainable, and that professional competence in interpreting depends on the interpreter's ability to recognize, regulate, and exploit attentional fluctuations rather than eliminate them entirely. On this basis, the study advances a system of attentional control training strategies grounded in empirical practices rather than prescriptive intuition. Selective attention practice enhances resistance to irrelevant stimuli; divided attention practice optimizes the balance between listening and note-taking; restorative practice shortens recovery time after interruptions; and anticipatory practice reduces future cognitive load by restructuring incoming information. Together, these practices form a coherent framework for managing attentional instability as an inherent feature of consecutive interpreting.

Overall, this research contributes to cognitive translatology by offering a process-oriented, empirically anchored model of attentional regulation, expanding current understandings of cognitive resilience in interpreting and opening new perspectives for interdisciplinary research at the intersection of cognitive psychology, cognitive translatology, and interpreter training.

Further research opportunities include the implementation of neurocognitive and biometric tools (e.g., EEG, eye-tracking) to better understand attentional dynamics, the development of AI-based tracking for personalized training, the exploration of different interpreting modes and language pairs, and the use of virtual simulations to connect controlled research with practical application. Long-term studies could further evaluate the impact of attentional training on interpreters' performance and resilience.

References

Abramson, Ch.I. (2022). Why the Study of Comparative Psychology is Important to Neuroscientists. *Frontiers in Behavioral Neuroscience*, 16: 1095033. DOI: https://doi.org/10.3389/fnbeh.2022.1095033

Adam, K., deBettencourt, M.T. (2019). Fluctuations of Attention and Working Memory. *Journal of Cognition, 2* (1): 33, 1-4. DOI: https://doi.org/10.5334/joc.70

Boiko, Ya.V. (2025). Interpreting in Business: Challenges and Solutions. *Folium,* 6, 32-38. DOI: https://doi.org/10.32782/folium/2025.6.4

Broadbent, D. (1958). *Perception and Communication.* London: Pergamon Press.

Bruya, B., Tang, Y.Y. (2018). Is Attention Really Effort? Revisiting Daniel Kahneman's Influential 1973 Book *Attention and Effort*. *Frontiers in Psychology*, 9: 1133. DOI: https://doi.org/10.3389/fpsyg.2018.01133

Chen, S. (2016). Note-taking in Consecutive Interpreting: A Review with Special Focus on Chinese-English Literature. *The Journal of Specialised Translation*, 26, 151-171. DOI: https://doi.org/10.26034/cm.jostrans.2016.282

Chernov, G.V. (2004). *Inference and Anticipation in Simultaneous Interpreting.* Amsterdam, Philadelphia: John Benjamins Publ. DOI: https://doi.org/10.1075/btl.57

Christoffels, I.K., De Groot, A.M.B. (2005). Simultaneous Interpreting: A Cognitive Perspective. In J.F. Kroll, A.M.B. de Groot (Eds.), *Handbook of Bilingualism: Psycholinguistic Approaches* (pp. 454-479). New York: Oxford University Press.

Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. New York: Harper & Row.

Darò, V., Fabbro, F. (1994). Verbal Memory During Simultaneous Interpretation: Effects of Phonological Interference, *Applied Linguistics*, 15 (4), 365-381. DOI: https://doi.org/10.1093/applin/15.4.365

Denfield, G.H., Ecker, A.S., Shinn, T.J., Bethge, M., Tolias, A.S. (2018). Attentional Fluctuations Induce Shared Variability in Macaque Primary Visual Cortex. *Nature Communications,* 9: 2654, 1-14. DOI: https://doi.org/10.1038/s41467-018-05123-6

Dragsted, B. (2005). Segmentation in Translation and Translation Memory Systems: An Empirical Investigation of Cognitive Segmentation and Effects of Integrating A TM System into The Translation Process. *International Journal of Translation*, 17 (1-2), 49-74.

Dragsted, B. (2010). Coordination of Reading and Writing Processes in Translation: An Eye on Uncharted Territory. In G. M. Shreve & E. Angelone (Eds.), *Translation and cognition* (pp. 41-62). Amsterdam: John Benjamins.

Gile, D. (1995). *Basic Concepts and Models for Interpreter and Translator Training*. Amsterdam, Philadelphia: John Benjamins. DOI: https://doi.org/10.1075/btl.8

Gile, D. (2002). Review of "Simultaneous Interpretation: A Cognitive-pragmatic Analysis" by Robin Setton. *Target International Journal of Translation Studies*, 13: 1, 177-183. DOI: https://doi.org/10.1075/target.13.1.18gil

Gile, D. (2021). The Effort Models of Interpreting as a Didactic Construct. In R. Muñoz Martín, S. Sun, D. Li (Eds.), *Advances in Cognitive Translation Studies* (pp. 139-160). Singapore: Springer. DOI: https://doi.org/10.1007/978-981-16-2070-6_7

Hervais-Adelman, A., Moser-Mercer, B., Michel, C.M., Golestani, N. (2015). fMRI of simultaneous interpretation reveals the neural basis of extreme language control. *Cerebral Cortex*, 25 (12), 4727-4739. DOI: https://doi.org/10.1093/cercor/bhu158

Kahneman, D. (1973). *Attention and Effort.* Englewood Cliffs: Prentice-Hall.

Köpke, B. Nespoulous, J.-L. (2006). Working memory performance in expert and novice interpreters. *Interpreting*, 2006, 8 (1), 1-23. DOI: https://doi.org/10.1075/intp.8.1.02kop

Lazarus, R.S. (1991). *Emotion and Adaptation*. New York: Oxford Axademic. DOI: https://doi.org/10.1093/oso/9780195069945.001.0001

Liu, M., Schallert, D.L., Carroll, P.J. (2004). Working memory and expertise in simultaneous interpreting. *Interpreting*, 6 (1), 19-42. DOI: https://doi.org/10.1075/intp.6.1.04liu

Maalej, Z. (2001). Robin Setton, Simultaneous Interpretation. A Cognitive-pragmatic Analysis. *Journal of Literary Semantics*, 30 (3), 210-214. DOI: https://doi.org/10.1515/jlse.2001.012

McLeod, S. (2023). Theories of Selective Attention in Psychology. *Simply Psychology*. Retrieved from https://www.simplypsychology.org/attention-models.html

Moser-Mercer, B. (2000). Simultaneous Interpreting: Cognitive Potential and Limitations. *Interpreting, 5* (2), 83-94. DOI: https://doi.org/10.1075/intp.5.2.03mos

Muñoz Martín, R. (2017). Looking toward the future of cognitive translation studies. In J.W. Schwieter, A. Ferreira (Eds.), *The Handbook of Translation and Cognition*, (pp. 555-571). Hoboken, NJ: Wiley Blackwell. DOI: https://doi.org/10.1002/9781119241485.ch30

Pöchhacker, F. (2005). From Operation to Action: Process-Orientation in Interpreting Studies. *Meta: Journal des traducteurs, 50* (2), 682-695. DOI: https://doi.org/10.7202/011011ar

Pöchhacker, F. (2016). *Introducing Interpreting Studies*. London, New York: Routledge.

Pöchhacker, F., Shlesinger, M. (Eds.). (2009). *The Interpreting Studies Reader*. London, New York: Routledge.

Posner, M.I. (1980). Orienting of Attention. *Quarterly Journal of Experimental Psychology, 32* (1), 3-25. DOI: https://doi.org/10.1080/00335558008248231

Posner, M.L., Petersen, S.E. (1990). The Attention System of the Human Brain. *Annual Review Neuroscience,* 13, 25-42. DOI: https://doi.org/10.1146/annurev.ne.13.030190.000325

Proverbio, A.M., Cok, B., Zani, A. (2002). Electrophysiological Measures of Language Processing in Bilinguals. *Cognitive Neuropsychologia*, 14 (7), 994-1017. DOI: https://doi.org/10.1162/089892902320474463

Seeber, K.G., Kerzel, D. (2012). Cognitive Load in Simultaneous Interpreting: Model Meets Data. *International Journal of Bilingualism*, 1 (2), 1-15. DOI: https://doi.org/10.1177/1367006911402982

Setton, R. (1999). *Simultaneous Interpretation. A Cognitive-pragmatic Analysis*. Amsterdam, Philadelphia: John Benjamins Publishing Company. DOI: https://doi.org/10.1075/btl.28

Shlesinger, M. (2002). *The Role of Prosody in Interpreting: Evidence from Simultaneous Interpretation*. In F. Pöchhacker & M. Shlesinger (Eds.), *The Interpreting Studies Reader* (pp. 119-130). London: Routledge.

Slaughter, J.W. (1901). The Fluctuations of the Attention in Some of their Psychological Relations. *The American Journal of Psychology, 12* (3), 313-334. DOI: https://doi.org/10.2307/1412281

Szabó, C. (2006). Language Choice in Note-Taking for Consecutive Interpreting. *Interpreting: International Journal of Research and Practice in Interpreting, 8* (2), 129-147. DOI: https://doi.org/10.1075/intp.8.2.02sza

Treisman, A. (1964). Selective Attention in Man. *British Medical Bulletin, 20* (1), 12-16. DOI: https://doi.org/10.1093/oxfordjournals.bmb.a070274

Wickens, C.D. (2008). Multiple Resources and Mental Workload. *Human Factors, 50* (3), 449-455. DOI: https://doi.org/10.1518/001872008X288394

Fluctuations in Attention During Consecutive Interpreting

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Drawing on advances in cognitive psychology and cognitive translatology, this study investigates short-term fluctuations in attention across the key stages of consecutive interpreting (listening, note-taking, and reformulation) and, with *the aim* of developing an integrative cognitive-empirical model, examines their internal and external causes, evaluates their effects on interpreting quality, and integrates cognitive, strategic, and attentional control strategies applicable to both experimental research and interpreter training.

The analysed material includes a series of interpreting sessions conducted by experienced and novice interpreters; a corpus of audio and video recordings from various professional fields; interpreters' notes, transcripts of source and target texts.

A mixed *methodological approach* incorporates empirical analysis (to monitor gaze changes, visual concentration, and time lapses in order to systematically classify fluctuations in attention across the listening, note-taking, and reformulation phases) and cognitive analytical tools such as subjective rating scales (NASA-TLX), dilemma analysis matrices and SWOT-based models (to simulate interpreters' decisions in real time under conditions of cognitive load).

On the basis of cognitive-empirical evidence, the study demonstrates that interpreter performance is determined by the ability to anticipate, redistribute, and restore attentional focus in real time across the stages of listening, note-taking, and reformulation. Attentional control during interpreting is a dynamic and variable process characterized by alternating periods of focus, fatigue, and recovery, closely related to task complexity, interpreter's experience, and external factors.

Quantitative analysis confirmed significant correlations between increased cognitive load and greater variability in attentional focus, which negatively influenced accuracy and fluency. Eye-tracking results also revealed that diffuse visual focus during note-taking predicted errors and memory lapses.

An analysis of the dilemmas revealed distinctive patterns of focus control depending on task complexity which shows systematic differences in attentional regulation between experienced and novice interpreters. Experienced interpreters demonstrated shorter and less frequent lapses, using efficient recovery strategies, such as anticipatory note-taking, optimized visual scanning, and semantic pre-activation to maintain fluency between comprehension and reformulation. In contrast, novice interpreters experienced longer lapses and higher cognitive load, especially while reformulating, particularly during the transition from comprehension to reformulation.

Cognitive-empirical evidence from three main scenarios of consecutive interpreting process—High-Load, Interruptions, and Conflict-Ridden Note-Taking—demonstrates that attentional fluctuations are not merely indicators of cognitive failure but function as signals that trigger compensatory strategies.

Based on cognitive-empirical data, a cognitive-empirical attentional control model (CEACM) was developed, which is the central innovation of the study.

CEACM integrates empirical (behavioural) indicators, such as eye movements, pauses, and hesitation patterns, with cognitive mechanisms, that is higher-level cognitive processes, including working memory coordination, decision-making, and metacognitive monitoring. Within CEACM, attentional fluctuations activate strategic mechanisms including chunking, anticipatory inference, selective omission, compression, and controlled pauses. These strategies operate as attention-concentration mechanisms, enabling interpreters to stabilize performance despite excessive speech rate, informational density, multitasking demands, or external distractions. Unlike existing effort-based models, CEACM captures short-term attentional fluctuations, their recovery cycles, and their direct impact on accuracy and fluency, providing a multidimensional explanation of interpreter performance and attentional regulation under varying cognitive loads.

The findings substantiate the view that attentional control is adaptive and trainable, and that professional competence in interpreting depends on the interpreter's ability to recognize, regulate, and exploit attentional fluctuations rather than eliminate them entirely. Consequently, the study advances a system of attentional control training strategies grounded in empirical practices rather than prescriptive intuition. Selective attention practice enhances resistance to irrelevant stimuli; divided attention practice optimizes the balance between listening and note-taking; restorative

practice shortens recovery time after interruptions; and anticipatory practice reduces future cognitive load by restructuring incoming information. Together, these practices form a coherent framework for managing attentional instability as an inherent feature of consecutive interpreting.

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