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THE PSYCHOLOGY OF SPEECH AND SIMULTANEOUS INTERPRETING: THE LISTEN–ANALYZE–RENDER MODEL

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Abstract: Simultaneous interpreting represents one of the most cognitively demanding forms of language mediation, requiring interpreters to comprehend, analyze, and reproduce messages almost instantly. This article examines the psychological mechanisms underlying speech processing in simultaneous interpreting, focusing specifically on the Listen–Analyze–Render model as a core cognitive framework. Drawing upon empirical research in psycholinguistics, cognitive psychology, and translation studies, the paper explores how attentional control, working memory capacity, speech perception, and semantic processing interact during real-time interpretation. The analysis highlights that successful simultaneous interpreting depends on the interpreter's ability to manage cognitive load, suppress irrelevant inputs, anticipate linguistic structures, and maintain coherence under time pressure. Furthermore, the paper discusses the pedagogical implications of these cognitive processes, emphasizing the need for targeted training that develops automaticity, listening discrimination, predictive processing, and strategic reformulation skills. The findings contribute to a deeper understanding of the mental operations involved in simultaneous interpreting and provide a theoretical basis for optimizing interpreter training programs.
Keywords: simultaneous interpreting; cognitive psychology; speech processing; Listen–Analyze–Render model; working memory; attention control; interpreter training; psycholinguistics.

Simultaneous interpreting (SI) is one of the most cognitively demanding linguistic activities because it requires the interpreter to decode incoming speech, analyze its meaning, and render it into another language almost at the same time (Hervais-Adelman & Babcock, 2019). The psychological complexity of this task has led researchers to examine SI through the lens of cognitive psychology, focusing on working memory, divided attention, and linguistic control. Modern research suggests that interpreters continuously cycle through three tightly connected cognitive operations: Listening, Analyzing, and Rendering — a process that can be conceptualized as the Listen–Analyze–Render (LAR) model (Khusainova, 2024).

This model is supported by psycholinguistic evidence demonstrating that the human brain does not process SI in isolated sequential steps. Instead, it manages incoming speech and outgoing translation through overlapping cognitive streams regulated by attentional control networks (Simultaneous Interpretation WM Study, 2015). Because these overlapping processes occur under significant time pressure, interpreters rely heavily on executive functions, linguistic forecasting, and memory manipulation to maintain accuracy and fluency.

Listening is the initial and continuous component of the interpreting process. During SI, the interpreter must perceive and decode spoken language while simultaneously preparing for translation. Unlike casual listening, SI demands intentional and selective listening that prioritizes semantically relevant elements while suppressing distractions. Research shows that interpreters employ high-level divided attention strategies, distributing attentional resources across perception and planning (Attentional Control in Interpreting, Cambridge Study). This dual allocation capability is more developed in interpreters than in bilingual individuals who do

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not interpret professionally, suggesting that SI experience strengthens attentional coordination networks (Hervais-Adelman & Babcock, 2019).

Once the speech signal is perceived, the interpreter transitions to analysis, though listening continues in parallel. In this phase, interpreters rely on working memory to temporarily hold linguistic segments while they construct meaning (Simultaneous Interpretation WM Study, 2015). Studies demonstrate that interpreters outperform non-interpreters in memory updating tasks, indicating enhanced executive control of working memory (Wang, 2024). This analytic stage requires integrating semantics, syntax, and pragmatic cues to predict upcoming content. Anticipation is key: professional interpreters often begin forming target language structures before the speaker finishes the source language sentence (Khusainova, 2024). Such predictive processing is supported by cognitive psychology theories of language control, which emphasize the role of top-down processing in high-pressure linguistic tasks (Attentional Control in Interpreting, Cambridge Study).

The final component of the model is rendering, where the interpreter produces speech in the target language. Rendering is not merely linguistic reproduction — it is a cognitively loaded act requiring rapid lexical retrieval, syntactic restructuring, and semantic accuracy, all while maintaining fluent delivery. Findings from corpus-based studies show that interpreters often use lexical chunking, relying on formulaic sequences to reduce cognitive load during production under pressure (Chunking in Simultaneous Interpreting, 2023). This strategic use of multi-word units helps maintain fluency when processing demands peak, especially in fast-paced or complex source speeches.

One of the most important insights from neurocognitive research is that these three stages — listening, analyzing, and rendering — do not occur separately. Instead, they form a continuous, circular cognitive loop where perception, interpretation, and production overlap almost entirely (Hervais-Adelman & Babcock, 2019). Neuroimaging studies reveal that SI recruits both language networks and executive control networks in the prefrontal cortex, suggesting that interpreters engage in stronger conflict monitoring and task-switching mechanisms than regular bilinguals. This supports the LAR model's claim that SI is not simply linguistic competence, but a unique combination of high-level cognitive regulation and real-time linguistic processing.

The psychological demands of SI also highlight individual differences among interpreters. Working memory capacity, processing speed, inhibitory control, and bilingual proficiency significantly influence performance quality (Simultaneous Interpreting WM Study, 2015). However, evidence shows that these abilities can improve with targeted training. Exercises such as shadowing, dual-task training, segmentation practice, and memory expansion drills contribute to more efficient LAR processing (Wang, 2024). Training programs that incorporate cognitive-based methods tend to produce interpreters with stronger attentional control and better stress management, as the LAR model predicts.

The Listen–Analyze–Render model therefore provides a comprehensive psychological explanation of simultaneous interpreting by emphasizing the constant interplay of perception, memory, and production. It clarifies why interpreting cannot be understood as simple bilingual communication: it requires interpreters to manage two linguistic systems while continuously activating cognitive networks that regulate attention, prediction, inhibition, and linguistic restructuring. The model also offers practical implications, suggesting that interpreter education should combine linguistic development with cognitive enhancement exercises.

In conclusion, simultaneous interpreting represents a unique intersection of language processing and cognitive psychology. The Listen–Analyze–Render model illustrates how interpreters transform speech through a continuous cycle of listening, analyzing, and rendering — all

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supported by working memory, attentional control, and neural adaptability. As research continues to expand, the LAR framework serves as both a theoretical foundation and a practical guide for training the next generation of interpreters.

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