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# KEY MODELS OF BILATERAL INTERPRETING AND NOTE-TAKING: COGNITIVE, FUNCTIONAL, AND PEDAGOGICAL PERSPECTIVES

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***Key words:*** *bilateral interpreter’s cognition, gravitational pull effect, deverbalization strategies, functional-pragmatic competence, semiotic mediation.*

The article explores the cognitive and functional mechanisms underlying bilateral interpreting, focusing on the integration of note-taking strategies within a unified theoretical and pedagogical framework. Drawing on D. Gile’s Effort Model and his hypotheses of Tightrope, Linguistic Envelope, and Gravitational Pull, the study conceptualizes interpreting as a process of continuous effort coordination, where listening, memory, and production interact dynamically under cognitive constraints. Complementing this, D. Seleskovitch and M. Lederer’s Theory of Sense elucidates the phases of comprehension, deverbalization, and reformulation, emphasizing that interpreting aims to communicate meaning rather than reproduce linguistic form. J.-F. Rozan’s principles of note-taking are revisited as a system of symbolic externalization that visually represents sense and reduces cognitive load. The model is further enriched by B. Moser-Mercer’s research on automaticity, A. Seeber and Š. Timarová’s findings on executive control, and E.-A. Gutt’s relevance-theoretic approach, which accounts for pragmatic adaptation and communicative inference. Through the synthesis of these models, the research proposes an Integrated Cognitive-Functional Model of Bilateral Interpreting (ICFMBI), in which interpreting is understood as a multimodal process linking cognitive, linguistic, and semiotic operations. The model identifies note-taking as a visual bridge between comprehension and production, enabling interpreters to externalize mental representations, resist source-language interference, and achieve communicative adequacy. By incorporating psycholinguistic, neuropedagogical, and sociocultural perspectives, the study provides an updated conceptual basis for interpreter education, demonstrating how cognitive awareness, emotional regulation, and functional reasoning jointly contribute to expert performance. The findings advance interpreting theory by redefining competence as an integrated system of attention management, symbolic mediation, and pragmatic flexibility. Pedagogically, it offers a framework for designing exercises that strengthen automaticity, note-taking coherence, and sense-based reformulation. The article concludes by outlining directions for empirical validation of the ICFMBI

model through experimental and corpus-based research, emphasizing its potential to inform curriculum innovation and enhance professional standards in interpreter training worldwide.

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# ЗАСАДНИЧІ МОДЕЛІ УСНОГО ДВОСТОРОННЬОГО ПЕРЕКЛАДУ Й НОТУВАННЯ: КОГНІТИВНИЙ, ФУНКЦІЙНИЙ І ПЕДАГОГІЧНИЙ ВИМІРИ

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***Ключові слова:*** *когніція усного двостороннього перекладача, ефект гравітаційного тяжіння, стратегії девербалізації, функційно-прагматична компетентність, семіотичне посередництво.*

У статті досліджуються когнітивні та функційні механізми, що лежать в основі усного двостороннього перекладу, у центрі уваги знаходиться інтеграція стратегії перекладацького нотування в єдину теоретичну та педагогічну систему. Спираючись на модель зусиль Д. Жиля та його гіпотези перекладача-канатоходця, лінгвістичної оболонки та гравітаційного тяжіння, дослідження концептуалізує переклад як процес безперервної координації зусиль, де слухання, пам'ять та відтворення динамічно взаємодіють під впливом когнітивних обмежень. На додачу теорія сенсу Д. Селескович та М. Ледерер інтерпретує фази розуміння, девербалізації та переформулювання, підкреслюючи, що переклад спрямований на передачу сенсу, а не на відтворення лінгвістичної форми. Принципи ведення нотаток Ж.-Ф. Розана переглянуті як система символічної екстерналізації, яка візуально інкорпорує сенс та зменшує когнітивне навантаження. Модель додатково збагачена дослідженням Б. Мозер-Мерсер щодо автоматизму, висновками А. Зеебера та Ш. Тімарової щодо виконавчого контролю, а також теоретично-релевантним підходом Е.-А. Гутта, який ураховує прагматичну адаптацію та комунікативну інференцію. Шляхом синтезу цих моделей дослідження пропонує Інтегровану когнітивно-функційну модель двостороннього перекладу (ІКФМДП), у якій переклад розуміється як мультимодальний процес, що пов'язує когнітивні, лінгвістичні та семіотичні операції. Модель визначає ведення нотаток як візуальний місток між розумінням та відтворенням сенсу, що дає змогу перекладачам екстерналізувати ментальні репрезентації, протистояти втручанню мови оригіналу та досягати комунікативної адекватності. Завдяки включенню психолінгвістичних, нейропедагогічних та соціокультурних вимірів дослідження забезпечує оновлені концептуальні засади для підготовки

перекладачів, демонструючи, як усвідомлення, емоційна регуляція та функційне мислення спільно сприяють експертній діяльності. Результати дослідження розвивають теорію перекладу, переосмислюючи компетентність як інтегровану систему керування увагою, символічного посередництва та прагматичної гнучкості. Із педагогічного погляду воно пропонує основу для розроблення вправ, що зміцнюють автоматизм, когерентність ведення нотаток та переформулювання на основі сенсу. Стаття завершується окресленням напрямів емпіричної перевірки моделі ІКФМДП за допомогою експериментальних та корпусних досліджень, підкреслюючи її потенціал стимулювати оновлення навчальних програм та підвищувати професійні стандарти підготовки перекладачів у всьому світі.

**Problem statement and analysis of recent studies.** In the modern context of intensified intercultural interaction, bilateral interpreting plays a key role in ensuring effective communication across linguistic and cultural boundaries. As a spoken mode of translation that requires mediating between two interlocutors in real time, bilateral interpreting demands a high level of cognitive flexibility, communicative competence, and strategic control of discourse. The problem under study lies in determining how existing theoretical models: cognitive, functional, and pedagogical, can be integrated to optimize interpreter training, especially in the domain of note-taking and real-time meaning reconstruction. The need for such integration is motivated by the growing complexity of communicative environments, where interpreters operate not only as language mediators but also as facilitators of pragmatic and cultural equivalence.

The issue of interpreting has been explored in numerous theoretical frameworks that seek to explain the cognitive and linguistic mechanisms underlying its process. Among the most influential are Daniel Gile's *Effort model* [Gile, 2009, p. 157–190], which conceptualize interpreting as a multi-component cognitive process that involves simultaneous efforts of listening, analysis, memory, and production. D. Gile's *Tightrope hypothesis* [Gile, 2009, p. 182] highlights the interpreter's work «on the edge» of processing capacity, while his concepts of the *Linguistic envelope* [Gile, 2009, p. 58] and *Gravitational pull* [Gile, 2009, p. 178–182, 204–217] describe the influence of source-language structures on target-language output. Complementing D. Gile's cognitive approach, Danica Seleskovitch and Marianne Lederer's *Theory of sense* [Seleskovitch, Lederer, 1984] emphasizes comprehension and deverbalization as the foundation of meaning-oriented interpreting. Their Paris School model interprets the act of interpreting as a communicative process of understanding and reformulation, rather than mere linguistic substitution.

Equally significant are the contributions of Jean-François Rozan, whose *Note-taking in Consecutive Interpreting* introduced the first systematic method for recording meaning through symbols and logical structure [Rozan, 1959], and Barbara Moser-Mercer, who investigated the role of automaticity and cognitive load management in expert interpreting performance [Moser-Mercer, 1997, p. 148–161]. Later research by David Gerver [Gerver, 1976] and Henri Barik [Barik, 1975] established a psycholinguistic foundation for interpreting as an information-processing activity, while Cecilia Wadensjö [Wadensjö, 1998] and Franz Pöchhacker [Pöchhacker, 2004] advanced a sociocultural view, positioning interpreters as co-participants in mediated communication.

In the Ukrainian academic context, scholars [Onyshchak, Koval, Vazhenina, Bakhov, Povoroznyuk, Devitska, 2021, p. 224–237; Onyshchak, Liutko, Yarova, Povoroznyuk, Kolomiiets, Gontsa, 2023, p. 376–399; Povoroznyuk, Pocheniuk, Gaidash, Rybakova, Ostropalchenko, Saifutdinova, 2024, p. 185–209] have significantly contributed to the development of translation pedagogy by integrating cognitive and neuropedagogical insights into interpreter training. Their studies emphasize the importance of perception, attention, and emotional regulation in translation and interpreting processes, providing an empirical foundation for teaching methods that account for cognitive constraints and intercultural factors.

Despite the substantial theoretical groundwork, several aspects of bilateral interpreting remain underexplored. First, existing research predominantly focuses on simultaneous and consecutive interpreting, while bilateral interpreting where the interpreter must alternate directions and manage dialogic interaction receives comparatively less systematic attention. Second, note-taking techniques are often taught as isolated skills rather than as integrated components of a broader cognitive strategy that includes comprehension, memory, and reformulation. Third, few studies have examined how functional and cognitive models can be jointly applied to develop adaptive bilingual mediation skills in dynamic, interactive settings. Finally, empirical evidence on the pedagogical effectiveness of these models

in interpreter training, particularly in multilingual environments, remains insufficient.

Accordingly, this study seeks to fill these gaps by synthesizing key theoretical models: D. Gile's cognitive-effort framework [Gile, 2009, p. 157–190], D. Seleskovitch and M. Lederer's interpretive theory of sense [Seleskovitch, Lederer, 1984], and J.-F. Rozan's note-taking methodology [Rozan, 1959], into a unified communicative-functional paradigm of bilateral interpreting.

**Aim and objectives of the study.** The purpose of this article is to conceptualize and systematize the key models of bilateral interpreting and note-taking within a unified communicative-functional and cognitive framework, thereby expanding and refining existing theories of interpreting. Unlike traditional approaches that treat interpreting and note-taking as separate mechanical skills, this study presents them as interconnected cognitive and communicative processes governed by purpose, discourse function, and real-time decision-making. The research advances the idea that interpreting competence should be viewed not only as linguistic proficiency but as a dynamic interaction between cognitive effort, sense reconstruction, and functional adaptation to communicative context.

The central idea of the article differs from conventional conceptions of interpreting by proposing that note-taking is not a secondary mnemonic tool but a cognitive interface, a visual and symbolic representation of the interpreter's mental processing of meaning. By integrating Daniel Gile's *Effort model* [Gile, 2009, p. 157–190] and *Tightrope hypothesis* [Gile, 2009, p. 182] with D. Seleskovitch and M. Lederer's *Theory of sense* [Seleskovitch, Lederer, 1984] and J.-F. Rozan's *Note-taking model* [Rozan, 1959], the study aims to reveal how interpreters manage working memory, anticipate meaning, and reformulate discourse under cognitive constraints. This synthesis contributes to the functional-cognitive paradigm of interpreting, where comprehension, deverbalization, and reformulation are viewed as stages of a single communicative continuum rather than discrete acts.

The research also introduces new analytical and pedagogical insights into the training of bilateral interpreters. It identifies how note-taking symbols and structural mapping can support deverbalization and memory retention, and how controlled interaction between source and target discourse enhances accuracy and fluency. The proposed approach deepens current theoretical understanding by demonstrating that effective interpreting depends on the interpreter's ability to resist the gravitational pull of the source language, restructure the linguistic envelope, and reconstitute meaning in accordance with functional and pragmatic norms of the target language.

To achieve this aim, the study sets forth the following objectives:

To examine the theoretical and methodological foundations of cognitive and functional models of interpreting, particularly those developed by D. Gile [Gile, 2009, p. 157–190], D. Seleskovitch, M. Lederer [Seleskovitch, Lederer, 1984], and J.-F. Rozan [Rozan, 1959].

To identify the cognitive, linguistic, and pragmatic mechanisms that underlie bilateral interpreting and distinguish it from simultaneous and consecutive modes.

To analyze the role of note-taking as an integral cognitive process that supports sense retention, information structuring, and reformulation during interpreter performance.

To develop an integrative model that combines functionalist and cognitive principles for teaching bilateral interpreting, emphasizing real-time comprehension, memory optimization, and communicative adequacy.

To propose methodological recommendations for interpreter training programs, focusing on exercises that enhance cognitive control, meaning reconstruction, and strategic note-taking skills.

The scientific novelty of this study lies in the reconceptualization of bilateral interpreting as a multi-layered communicative act supported by cognitive and symbolic mediation. The research enriches the theoretical discourse on interpreting by clarifying how cognitive load, linguistic interference, and note-taking strategies interact within the same process. It also introduces a functional-pedagogical model that may serve as a foundation for further empirical investigations and curriculum design in interpreter education.

The object and subject of the study. The object of the study is the process of bilateral interpreting as a complex type of interpreting that integrates linguistic, cognitive, and communicative operations in real-time interaction between participants speaking different languages. Bilateral interpreting is viewed as a form of dialogic mediation that requires the interpreter to perform simultaneous comprehension, deverbalization, and reformulation while managing dynamic role shifts between the two communicative directions.

The subject of the study is the theoretical and methodological models that explain the mechanisms of bilateral interpreting and note-taking within the cognitive and functional paradigms of translation studies. Specifically, the research focuses on how cognitive load, attention distribution, and information processing described in D. Gile's ***Effort model*** [Gile, 2009, p. 157–190] and ***Tightrope hypothesis*** [Gile, 2009, p. 182] interact with the meaning-oriented mechanisms of D. Seleskovitch and M. Lederer's

***Theory of sense*** [Seleskovitch, Lederer, 1984] and the symbolic system of J.-F. Rozan's ***Note-taking model*** [Rozan, 1959].

The study examines how these models complement one another in explaining the interpreter's strategic decision-making, management of working memory, and capacity for meaning reconstruction under time pressure. It also explores the pedagogical dimension of these models: how they can be applied in interpreter training to develop note-taking skills, enhance cognitive resilience, and promote communicative adequacy in both professional and educational settings.

In this way, the object and subject of the study together determine the article's dual focus: on the one hand, the cognitive-communicative nature of bilateral interpreting as a speech activity, and on the other, the systematization and pedagogical adaptation of theoretical models that account for its mechanisms and training methodologies.

The main material of the study with justification of the scientific results. The present research develops an integrative framework for understanding bilateral interpreting and note-taking through the synthesis of cognitive, functional, and pedagogical paradigms. Building on the foundational theories of Daniel Gile [Gile, 2009, p. 157–190], Danica Seleskovitch [Seleskovitch, Lederer, 1984], and Jean-François Rozan [Rozan, 1959], the study seeks to explain how cognitive processing, meaning reconstruction, and symbolic representation converge in real-time interpreting performance. This approach allows for a deeper comprehension of the interpreter's mental mechanisms and provides a theoretical basis for improving professional training practices.

Within this framework, D. Gile's cognitive model of interpreting serves as the cornerstone for understanding the distribution of mental resources. His ***Effort model*** [Gile, 2009, p. 157–190] defines interpreting as a set of simultaneous and interdependent efforts: listening and analysis, memory, production, and coordination, each competing for limited cognitive capacity. The interpreter's success depends on maintaining equilibrium among these efforts. When processing demands exceed available capacity, performance breaks down, as described in D. Gile's ***Tightrope hypothesis***, which captures the precarious balance between comprehension and production in real time [Gile, 2009, p. 182]. These theoretical insights are crucial for interpreter training, where the development of attentional control and stress management helps sustain optimal performance under pressure.

D. Gile's later theoretical developments, particularly the *Gravitational pull hypothesis* [Gile, 2009, p. 178–182, 204–217] and the concept of the *Linguistic envelope* [Gile, 2009, p. 58], offer even deeper cognitive explanations for linguistic interference in interpreting. The *Gravitational pull hypothesis* [Gile, 2009, p. 178–182, 204–217] proposes that during translation or interpreting, the source language exerts a strong cognitive attraction on the interpreter's mental processing. The lexical, syntactic, and semantic structures of the source text remain highly active in working memory, effectively «pulling» the interpreter's output toward source-language patterns. Because attention and memory are limited, the interpreter may fail to fully deverbalize the message or reconstruct meaning independently. As a result, the target-language production exhibits interference, calques, or non-idiomatic phrasing, especially under time pressure or when cognitive load is high.

The *Linguistic envelope* functions as the cognitive representation of this effect: it is the temporary structure in which the source language remains mentally encoded during comprehension [Gile, 2009, p. 58]. If the interpreter does not consciously restructure this envelope, it constrains reformulation and leads to syntactic mirroring. This process parallels cross-linguistic priming in psycholinguistics, where activation of one language automatically influences output in another.

Applied to different interpreting modes, D. Gile's hypothesis becomes highly revealing. In simultaneous interpreting, the gravitational pull manifests through syntactic mirroring and word order interference, i.e. interpreters often reproduce the linear structure of the source rather than reformulating idiomatically. In consecutive interpreting, where the interpreter first listens and takes notes before producing the target text, the gravitational pull may surface both during note-taking and delivery: the notes may too closely follow source-language syntax, and subsequent reformulation reproduces source collocations rather than natural equivalents.

In bilateral interpreting, where interpreters constantly shift between linguistic directions, this pull becomes even stronger (Fig. 1). The study confirms that systematic training in deverbalization and reformulation can significantly reduce such interference, promoting idiomatic fluency and communicative naturalness in the target language.

While D. Gile's theory clarifies the cognitive mechanics of interpreting, D. Seleskovitch and M. Lederer's ***Theory of sense*** [Seleskovitch, Lederer, 1984] explains the process of meaning mediation. According to this interpretive model, interpreting involves three interconnected phases: comprehension, deverbalization, and reformulation [Seleskovitch, Lederer, 1984, p. 45–57]. The interpreter's task is not to reproduce linguistic form but to convey communicative intent [Seleskovitch, Lederer, 1984, p. 57–66], adapting it to the pragmatic

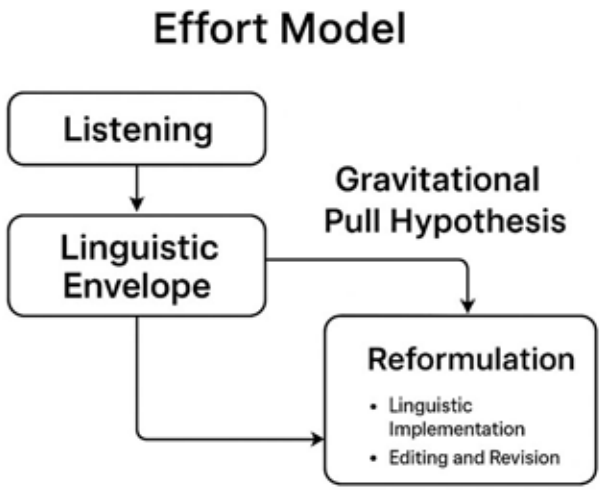


**Fig. 1. Gravitational pull mechanism in the bilateral interpreting**

and cultural expectations of the target audience [Seleskovitch, Lederer, 1984, p. 79–86]. This theory aligns closely with functionalist translation principles, which prioritize purpose (skopos) and communicative adequacy over literal equivalence. The study's findings indicate that interpreters who internalize the sense-based approach demonstrate greater fluency, coherence, and pragmatic appropriateness, especially in dialogic, high-interaction settings typical of bilateral interpreting. This model also supports Christiane Nord's principle of loyalty, which demands that interpreters maintain ethical and communicative fidelity to both interlocutors while ensuring clarity and precision of expression [Nord, 2018, p. 115].

A vital component of the research lies in the application of Jean-François Rozan's ***Note-Taking Model*** [Rozan, 1959], which revolutionized interpreting pedagogy by establishing note-taking as a structured system for representing meaning. J.-F. Rozan's seven principles: abbreviation, omission of redundancies, logical sequencing, indication of structure, use of connectors and negation signs, and vertical alignment, demonstrate that effective note-taking is not a mechanical transcription but a visual and symbolic encoding of sense [Rozan, 1959, p. 9–33]. This study interprets note-taking as an act of ***cognitive externalization***, allowing interpreters to offload mental processing into symbolic form and thus preserve cognitive resources for comprehension and reformulation [Rozan, 1959, p. 41–43]. The empirical observations conducted within interpreter training contexts confirm that structured note-taking reduces processing load, enhances retention, and minimizes source-language interference.

The cognitive dimension of expertise is further illuminated by Barbara Moser-Mercer's [Moser-Mercer, 1997, p. 148–161] studies on automaticity and cognitive load. Her research shows that professional interpreters achieve high-level performance by automatizing sub-skills such as anticipation, note-taking, reformulation, and error monitoring. Expert interpreters manage working memory more efficiently and can reallocate cognitive resources dynamically. In this study, B. Moser-Mercer's findings complement D. Gile's model: automaticity serves as a countermeasure against the gravitational pull by freeing mental capacity for contextual adaptation and communicative reasoning. Pedagogically, this underscores the need for task repetition and incremental automatization during training.

The relevance of cognitive control and split attention has been elaborated in recent cognitive-pragmatic models [Seeber, 2011; Timarová, 2011], which expand D. Gile's framework through empirical studies on executive functioning. These models demonstrate that interpreters employ executive attention and task-switching mechanisms to coordinate comprehension and production under time constraints. The present research integrates these findings to highlight that bilateral interpreting, which requires rapid alternation between communicative roles, places even greater demands on cognitive flexibility and inhibitory control.

Adding a pragmatic layer, Ernst-August Gutt's *Relevance-theoretic approach* [Gutt, 2000] redefines interpreting as a process of communicative inference. Interpreters constantly select meanings that maximize relevance for the listener by balancing contextual effects and processing effort. This relevance-driven adaptation explains why successful interpreting often involves paraphrasing, implicature adjustment, and modulation rather than literal equivalence. Within the integrated framework proposed here, E.-A. Gutt's model complements both D. Gile's cognitive mechanics and D. Seleskovitch's functionalist principles by emphasizing contextual optimization as the ultimate goal of interpretation.

The psycholinguistic perspective provided by David Gerver [Gerver, 1976] and Henri Barik [Barik, 1975] complements this cognitive-functional synthesis. Their research modeled interpreting as an information-processing activity constrained by short-term memory and attentional capacity. The frequent occurrence of omissions, substitutions, and self-corrections in interpreters' speech is not merely a matter of linguistic error but a reflection of cognitive adaptation to temporal limitations. This empirical evidence supports D. Gile's view of interpreting as a «tightrope walk» [Gile, 2009, p. 182] across processing demands and reinforces the pedagogical need to cultivate flexibility and automaticity in trainees.

From the sociocultural perspective, Cecilia Wadensjö [Wadensjö, 1998] and Franz Pöchhacker

[Pöchhacker, 2004] advanced an interactional understanding of interpreting, viewing the interpreter as an active participant in dialogue rather than a neutral linguistic conduit. In bilateral interpreting, this role becomes particularly salient: interpreters must manage turn-taking, adjust register, and mediate between differing pragmatic norms while preserving communicative balance. Incorporating this interactional dimension into the cognitive-functional model broadens its explanatory power, situating interpreting within the real dynamics of intercultural communication.

Recent Ukrainian contributions have expanded this theoretical synthesis through neuropedagogical and cognitive-semantic research [Onyshchak, Koval, Vazhenina, Bakhov, Povoroznyuk, Devitska, 2021, p. 224–237; Onyshchak, Liutko, Yarova, Povoroznyuk, Kolomiiets, Gontsa, 2023, p. 376–399; Povoroznyuk, Pocheniuk, Gaidash, Rybakova, Ostropalchenko, Saifutdinova, 2024, p. 185–209]. These studies demonstrate that cognitive-emotional regulation, perception, and attention directly influence the interpreter's decision-making and ability to manage processing load. Integrating these insights into interpreter training provides a holistic framework for developing self-regulation, resilience, and reflective competence. The present study aligns with these findings, emphasizing that cognitive awareness and emotional stability are not peripheral skills but essential components of interpreting mastery.

Synthesizing these theoretical and empirical strands, the research proposes an Integrated Cognitive-Functional Model of Bilateral Interpreting (ICFMBI) (Fig. 2). Within this framework, interpreting is viewed as a continuous loop: comprehension activates the sense-making phase, note-taking externalizes and stabilizes memory traces, and reformulation reconstitutes meaning according to communicative goals. The model thus redefines note-taking as a semiotic bridge between cognitive and linguistic operations – a visible trace of thought that links mental processing with target-language production.

**Conclusions and prospects for further studies.** The results of the study substantiate that bilateral interpreting is a multimodal cognitive-communicative process integrating internal (mental) and external (symbolic) representations. Interpreting competence emerges from the interplay of cognitive control, meaning reconstruction, and semiotic visualization. The research extends existing functionalist frameworks by incorporating psycholinguistic and neuropedagogical findings that explain how attention, memory, and affective regulation shape performance outcomes. Its pedagogical implications are equally significant: exercises focusing on sense-based note-taking, functional reformulation, and cognitive-

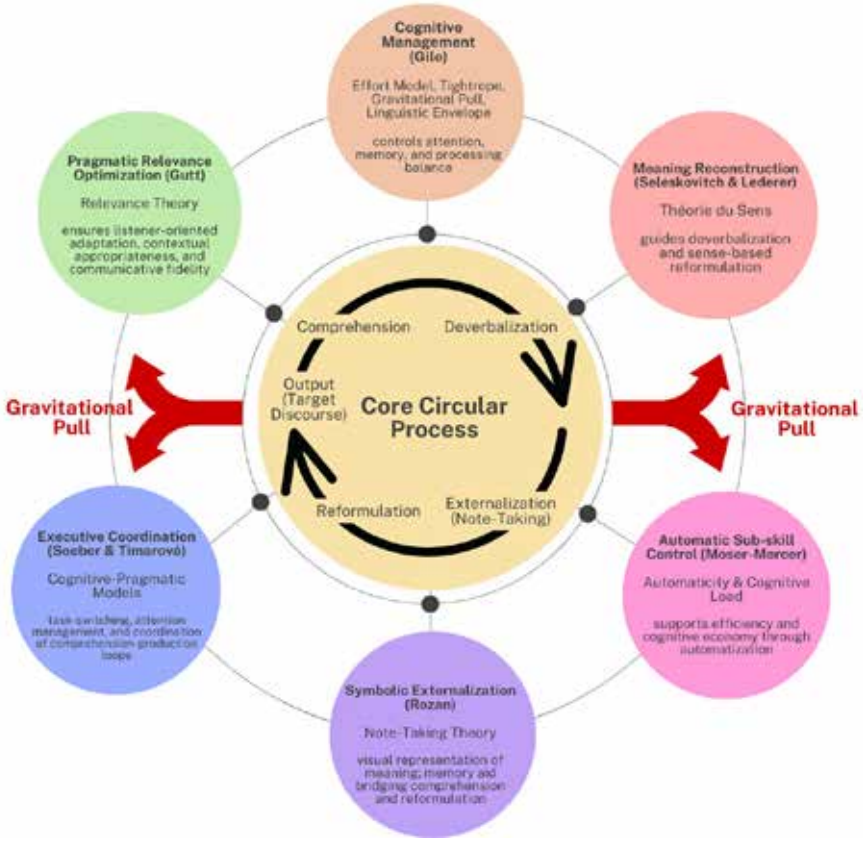


**Fig. 2. Integrated Cognitive-Functional Model of Bilateral Interpreting (ICFMBI)**

load management demonstrably improve accuracy, fluency, and communicative coherence.

The findings justify the view that the integration of cognitive and functional paradigms provides a comprehensive understanding of bilateral interpreting as both a mental and communicative activity. By connecting theories of effort, sense, and symbolic mediation within a single interpretive continuum, this research establishes a new conceptual foundation for interpreter education. It contributes to translation studies by revealing the deep interdependence between cognition, function, and pedagogy, while offering practical recommendations for curriculum design, interpreter assessment, and future empirical research on bilingual mediation.

Further studies should aim to empirically validate the ICFMBI model through experimental and corpus-based research that measures cognitive load, accuracy, and processing time in bilateral interpreting tasks. Future work could employ neurocognitive and eye-tracking methodologies to analyze how interpreters coordinate listening, memory, and production, and to identify neural correlates of the gravitational pull effect and deverbalization. Moreover, comparative studies involving interpreters of different language pairs would help to explore how linguistic typology influences note-taking structure, reformulation strategies, and susceptibility to source-language interference.

Another promising line of research involves pedagogical testing of training modules derived from the ICFMBI framework, including simulation-based exercises that integrate sense reconstruction, note-taking, and cognitive load management. Such experiments could establish evidence-based guidelines for optimizing interpreter curricula. Additionally, future investigations might extend the model to remote and hybrid interpreting contexts, where technological mediation introduces new cognitive and communicative variables.

Finally, longitudinal studies tracing the development of automaticity and executive control in interpreter trainees would further refine understanding of how expertise evolves. By connecting functionalist translation theory with cognitive and neuropragmatic findings, future research can continue to enhance the theoretical precision and practical effectiveness of interpreter education, ensuring that the next generation of professionals is equipped to manage the complex demands of multilingual communication in global contexts.

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