Skrylnyk, S. (2026). Metacognitive regulation as supervisory control in simultaneous interpreting assessment. *Current Trends in Translation Teaching and Learning E, 13.*
https://doi.org/10.51287/cttle20262

Metacognitive regulation as supervisory control in simultaneous interpreting assessment

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Abstract

This article examines metacognitive regulation as a higher-order supervisory control mechanism in English–Ukrainian simultaneous interpreting (SI). Drawing on a mixed design that combines corpus-based analysis of institutional and crisis-relevant English–Ukrainian SI (2014–2025) with a training experiment involving MA-level interpreting students, the study focuses on the observable regulatory behaviour of interpreters in various linguistic and cognitive situations. Regulation is operationalised through four indicators: ear–voice span (EVS) recovery dynamics, repair timing and severity, trigger-aligned compression, and pragmatic recalibration. In English–Ukrainian SI, the direction-specific demands on regulation are both structural (syntactic normalisation, ellipsis resolution, segmentation at clause boundaries) and pragmatic (recalibration of stance and agency, which can prevent escalation while preserving propositional content). The results indicate that what characterises effective SI performance is the speed of stabilisation after overload triggers such as speech-rate spikes, information density, syntactic packing, and pragmatic risk; uniformly low processing lag and low error rates are weak proxies for it. The empirical analysis is based on the coding of 169 trigger-centred episodes, annotated for temporal coordination (EVS re-centring), repair behaviour, compression or restructuring, and pragmatic recalibration. The training experiment further indicates that metacognitive instruction is associated with improvements in regulatory decision-making, resulting in clearer output, higher precision, and reduced cognitive strain. The findings support a process-oriented view of SI competence and have direct implications for interpreter training, assessment, and technology-mediated interpreting environments.

Keywords: metacognitive regulation, cognitive function, simultaneous interpreting, corpus-based interpreting studies, interpreting quality assessment.

1. Introduction

The performance stability of simultaneous interpreting depends on the interpreter's capacity to monitor ongoing processing, detect emerging overload, and implement timely strategic adjustments before local disruptions escalate into systemic breakdown. This article treats that capacity as metacognitive regulation: a higher-order supervisory layer that coordinates core cognitive mechanisms (attention, inhibition, working memory, and monitoring) and becomes particularly salient under fluctuating task demands.

Research in interpreting cognition has predominantly modelled the task through constraints and trade-offs, including limited processing capacity, time pressure, dual-task coordination, and competition between source- and target-language representations (Gile, 2009; Seeber, 2017). These accounts clarify why interpreting performance is vulnerable to breakdown. They often under-specify, however, the

mechanism through which interpreters actively manage instability when constraints intensify, especially where the input varies rapidly in informational density, pragmatics, and affective load. In practice, this means deciding whether to compress, segment, or recalibrate stance before a local difficulty escalates.

Evidence from interpreting studies suggests that what distinguishes expert performance is discriminating control over when to depart from default rendering routines, alongside more efficient routine processing. Under increased information density, experienced interpreters more readily employ controlled compression, redundancy reduction, and segmentation adjustments; under pragmatic risk, they recalibrate force and stance; under heightened emotional salience, they suppress contagion effects and stabilise delivery while preserving communicative intent. Such patterns have been reported across work on temporal coordination, self-repair behaviour, and strategic reformulation (Dong et al., 2018; Efklides, 2017; Plevoets & Defrancq, 2016; Seeber, 2017; Setton & Dawrant, 2016). Greater capacity alone does not account for them. They point to a supervisory process that evaluates the adequacy of current processing and authorises targeted intervention.

In cognitive psychology, metacognitive regulation is commonly defined as the set of monitoring and control operations that track cognitive activity, evaluate task success, and adjust strategy selection under conditions of uncertainty or rising difficulty (Bhandari & Badre, 2018; Dong & Li, 2020; Dunlosky & Metcalfe, 2009; Efklides, 2017). In a time-critical domain such as simultaneous interpreting, regulation is expected to be rapid, selective, and only partially accessible to explicit introspection. It nevertheless leaves behavioural traces. In interpreting, these traces can be observed in systematic shifts in ear–voice span (EVS) management, repair profiles, and the timing of strategic compression or reformulation, particularly when task demands cross a stability threshold.

Findings from bilingualism research converge with this view by treating supervisory monitoring and adaptive control as distinct from inhibition in a narrow sense. Contemporary accounts of bilingual control give a central place to higher-level mechanisms that evaluate conflict, effort, and contextual demands and then modulate lower-level language control accordingly (Abutalebi & Green, 2016; Costa & Sebastián-Gallés, 2014). Neurocognitive studies of interpreters suggest that expertise involves a stronger engagement of monitoring and adaptive control networks. Especially relevant is the analysis of conditions that require the flexible reallocation of effort and robust performance evaluation (Babcock & Vallesi, 2017; Becker et al., 2016; Hervais-Adelman et al., 2015). This evidence supports the plausibility of a supervisory layer that operates above routine executive control, although it does not directly measure the metacognitive conditions.

Interpreting-specific frameworks in cognitive translation studies reinforce the same idea. Situated and expertise-oriented approaches show that interpreter

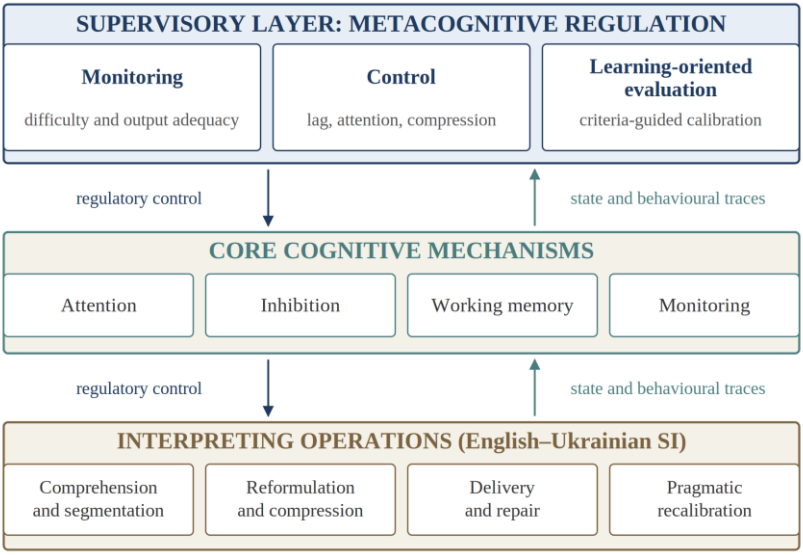
performance is shaped by professional norms, contextual constraints, and goal-directed decision-making, and not by automatic linguistic transformation alone (Alonso-Bacigalupe, 2010; Alonso-Bacigalupe & Romero-Fresco, 2024; Babcock & Vallesi, 2015, 2017; Becker et al., 2016; Muñoz Martín, 2016; Pym, 2013). Within this perspective, monitoring and self-regulation belong to the core of expert action: interpreters continuously evaluate whether preserving lexical detail, rhetorical force, or pragmatic safety best serves the communicative purpose under current processing conditions.

Metacognitive regulation is therefore better modelled as threshold-driven and context-sensitive than as continuous reflection. Under stable conditions, automatised routines dominate. When destabilising factors appear (speech-rate spikes, terminological clustering, topic shifts, emotionally charged content), interpreters shift toward more controlled processing and rebalance priorities: coherence over completeness, stability over stylistic mimicry, pragmatic appropriateness over lexical symmetry. Such shifts are especially visible in crisis and high-stakes institutional settings, where the cost of an unregulated error extends beyond linguistic distortion to pragmatic and ethical misalignment (Albl-Mikasa, 2023; Albl-Mikasa & Tiselius, 2021; Defrancq & Fantinuoli, 2021; Valdeón, 2023).

Training research suggests that metacognitive regulation is a distinct aspect of an interpreter's competence. Studies in interpreter training show that instruction targeting self-monitoring, effort awareness, and deliberate strategy improves the quality scores and also the performance stability: reduced volatility in temporal measures, fewer disruptions, and more solid recovery patterns after the overload (Becker et al., 2016; Magnifico & Defrancq, 2019; Salaets & Brône, 2023). These outcomes are difficult to explain without assuming a supervisory process that governs the deployment of lower-level skills under changing demands.

These strands justify modelling metacognitive regulation as a higher-order layer in simultaneous interpreting (see Figure 1). It monitors the adequacy of ongoing processing, detects emerging instability, and initiates strategic interventions that protect communicative function under constraint. Incorporating this layer lets cognitive accounts of expertise explain resilience, adaptability, and pragmatic-ethical control in real-world interpreting, and not efficiency alone.

Figure 1. Metacognitive regulation as a supervisory layer coordinating core cognitive mechanisms and interpreting operations in English–Ukrainian simultaneous interpreting.



2. Metacognitive regulation as a control layer in simultaneous interpreting

Metacognitive regulation (MR) can be treated as a higher-order layer that *supervises* real-time interpreting. In simultaneous interpreting (SI), the interpreter has to coordinate comprehension, reformulation, and delivery under time pressure; the crucial point is that these processes do not simply run in parallel, but must be *kept in balance* moment by moment. The literature on attentional control in interpreting already frames SI as a task where language control and processing control are coupled and dynamically adjusted (Dong & Li, 2020). What metacognitive regulation adds is the mechanism that decides *when* to tighten control (e.g., shorten lag, simplify output), *when* to release it (e.g., expand and refine), and *how* to diagnose emerging errors early enough to prevent cascading breakdowns.

In the present study, the construct is specified for English–Ukrainian simultaneous interpreting, a direction that often requires early regulation because English information packaging and stance marking do not map neatly onto Ukrainian target norms. In English–Ukrainian SI, pragmatic force, agency, and evaluative framing frequently demand rapid supervisory decisions: the interpreter may preserve propositional content but adjust formulation (e.g., mitigation, de-

agentivisation, controlled generalisation) to maintain institutional appropriateness and prevent avoidable repair cascades. This language-pair specificity is integrated into the MR pipeline and the episode-based scoring logic outlined below.

A useful way to operationalise this layer is to link it to the interpreter's ability to form rapid internal judgements about (a) current processing difficulty, (b) output adequacy, and (c) risk of overload, and then to translate these judgements into concrete action. Empirically, this is reflected in the fact that interpreters rarely maintain a stable EVS across a speech; EVS fluctuates with delivery type, speech rate, directionality, sentence position, and interpreter experience (Janikowski & Chmiel, 2025). Corpus-based work likewise shows that EVS is shaped by multiple predictors (Collard & Defrancq, 2019a) and that it in turn predicts disfluency, alongside source delivery rate (Collard & Defrancq, 2019b), which indicates that lag is part of a managed response to changing task demands and not a passive consequence of processing. From a metacognitive perspective, EVS becomes a *control parameter*: it is adjusted when the interpreter senses that the comprehension buffer is at risk, or when output planning needs more time for a difficult segment.

This control logic becomes clearer when EVS is viewed together with repair behaviour. Self-repair in SI works as a visible trace of monitoring, in which the interpreter interrupts the stream to restore alignment with intended meaning, norms, or audience expectations (Magnifico & Defrancq, 2019). Repairs often appear at those points where the interpreter's internal evaluation detects a mismatch between planned and produced output. Monitoring therefore extends beyond noticing errors after the fact to deciding whether an error is *worth fixing now*, given the cost of disruption. That decision is deeply SI-specific: repairing too much can destabilise fluency, but repairing too little may degrade accuracy and pragmatic adequacy. The fact that repairs are patterned and analysable suggests that they are governed by controllable criteria (Magnifico & Defrancq, 2019).

Recent methodological advances allow us to measure temporal control on a large scale. Automated and semi-automated techniques for measuring EVS help researchers observe micro-fluctuations across extended samples and reduce the time required for manual annotation (Guo & Han, 2024). Studies in corpus analytics and interpreting technology further illustrate the application of automatic alignment in ascertaining décalage and correlating it with delivery conditions and disfluency indicators (Stewart et al., 2018). Because temporal coordination can now be measured more precisely, metacognitive regulation can be examined empirically and not only theoretically. These tools make it possible to analyse it as a series of choices made over time.

Multimodal evidence strengthens the argument that metacognitive regulation is a genuine higher-order layer. When input is multimodal rather than purely auditory, interpreters must allocate attention across channels and decide what deserves

priority under stress. Work using ear–eye–voice span measures shows that professionals maintain more stable patterns under increased speech rate, which points to more efficient resource management and better cross-modal attention control (Yang et al., 2025). Attention allocation matters for metacognition because it can be managed strategically once the interpreter has a reliable sense of what is happening in their own processing. Interpreters frequently report subjective indicators of approaching overload, which can be reframed in research terms as metacognitive access to internal cues (e.g., rising effort, falling confidence, reduced planning horizon) that trigger compensatory strategies.

Training research increasingly reports that these supervisory skills develop through structured reflection and self-assessment, and not only through additional practice hours. Metacognitive self-perception has been analysed as a component of interpreting competence that shapes how trainees understand their strengths, diagnose weaknesses, and select strategies under pressure (Fernández Bravo, 2019). Moving from perception to intervention, a recent study shows that standards-based self-assessment can change students' metacognitive strategy use and interpreting performance, which supports the claim that metacognition is trainable and causally relevant (Mei & Yang, 2026). In these approaches metacognition is a practical mechanism that improves decision quality in the planning, monitoring, and evaluation phases of performance, which SI compresses into seconds.

This is also where the technology shift becomes theoretically meaningful. Remote and platform-based interpreting conditions create new sources of load and uncertainty, which can make it harder for interpreters to monitor factors such as room acoustics, boothmate coordination, and stable visual access. Studies of video-based interpreting platforms have reported significant changes in interpreters' experiences, including cognitive load and wellbeing issues, which indicates that interpreters modify regulatory strategies when environmental feedback diminishes or intensifies (Salaets & Brône, 2023). Studies of cognitive load in distance and remote interpreting also show how task configuration can increase the load and change the choices interpreters have to make (Zhu & Aryadoust, 2022). Under such conditions, metacognitive regulation is even more critical. When the environment is less predictable, interpreters have to rely more on their own monitoring and more on purposefully controlling the pace, lag, and repair.

These findings collectively substantiate the classification of metacognitive regulation as a higher-order layer comprising three interrelated functions in SI:

- Monitoring: rapid internal evaluation of difficulty and output adequacy, reflected in patterned use of EVS adjustments and selective repair (Janikowski & Chmiel, 2025; Magnifico & Defrancq, 2019).

- Control: deliberate modulation of temporal coordination (lag), attention allocation, and compression/expansion decisions as task demands shift (Collard & Defrancq, 2019a; Dong & Li, 2020; Yang et al., 2025).
- Learning-oriented evaluation: post-task and in-task calibration through self-assessment frameworks that make monitoring criteria explicit and actionable, especially in training settings (Fernández Bravo, 2019; Mei & Yang, 2026).

This framing also resolves a recurring limitation in SI models that describe constraints well but remain underspecified about *how* interpreters steer their performance in real time. If EVS, repair behaviour, and cross-modal attention measures are treated as observable outcomes of an underlying supervisory system, then metacognitive regulation can be modelled as the mechanism that links internal judgements to external performance adjustments, and can be targeted directly in interpreter education, including under remote and technology-mediated conditions (Guo & Han, 2024; Salaets & Brône, 2023; Stewart et al., 2018).

2.1. Defining metacognitive regulation (MR)

Metacognitive regulation in simultaneous interpreting should not be conflated with general awareness, reflection, or post hoc self-evaluation. Awareness refers to the interpreter's conscious access to task states; regulation denotes online supervisory decisions that actively modify processing trajectories under time pressure (Dong & Li, 2020). Nor is regulation equivalent to experience or automaticity: expert performance may remain unstable if supervisory control fails to intervene at critical moments (Gile, 2009; Seeber, 2017). In this study, metacognitive regulation is therefore treated as functionally defined control, observable through its effects on timing, repair behaviour, and reformulation choices rather than through introspective reports. This is also why the layer is labelled *supervisory control* and not *monitoring*. Monitoring names the evaluative half of the construct, the running assessment of processing difficulty and output adequacy, but not the half that acts: the selection and timing of an intervention once a discrepancy has been detected. Both halves are required for the episode logic developed below, in which an episode is counted only where detection is followed by an intervention and a stabilisation signature (Sections 2.8–2.9).

2.2. Why an episode-based logic is required

Global averages such as mean EVS or overall error rates obscure the dynamics through which stability is maintained in simultaneous interpreting. Interpreting performance is known to fluctuate locally in response to discourse-specific pressures, including speech-rate acceleration, information density, and pragmatic risk (Janikowski & Chmiel, 2025; Plevoets & Defrancq, 2016). An episode-based

logic makes it possible to isolate moments of destabilisation and to examine how interpreters respond to them, instead of averaging those responses away. This approach aligns with recent methodological work arguing that recovery dynamics and short-term adjustments are more diagnostic of expertise than global means (Guo & Han, 2024).

2.3. Rationale for the selected indicators

The indicator set used in this study combines temporal, behavioural, and pragmatic dimensions in order to capture regulation as a multi-layered process. EVS dynamics index temporal coordination and buffering control, while repair timing and severity reflect monitoring decisions and cost management under pressure (Magnifico & Defrancq, 2019; Seeber, 2017). Controlled compression provides evidence of strategic load reduction that preserves communicative function, as distinct from random omission (Muñoz Martín, 2016; Pym, 2013). Pragmatic recalibration, finally, captures regulation at the discourse level, where interpreters adjust stance, agency, or evidential framing to maintain institutional appropriateness (House, 2015). Together the four indicators allow regulation to be observed directly in behaviour, without recourse to composite indices or introspective measures.

2.4. English–Ukrainian as a high-yield language pair for studying regulation

The English–Ukrainian direction offers particularly rich conditions for observing metacognitive regulation because pragmatic and syntactic asymmetries often require rapid supervisory decisions. The three micro-episodes below are transcribed from the corpus. Each is identified by speaker, event and date. Source wording follows the primary institutional record in each case (the verbatim transcript of the United States Congress, the audio record of the United Nations media library, or the issuing institution's published text of the statement), and the target rendition is reproduced as delivered, with the double slash (//) marking a prosodic boundary in the ELAN annotation. Ukrainian is not a working language at any of the institutions concerned, so the target renditions analysed here are not institutional booth output; their provenance is specified in Section 4.2. An ellipsis inside the quotation marks of a source segment indicates that the excerpt begins or ends inside a longer sentence.

Micro-episode 1. Evaluation and attribution under institutional pressure

Source: Josep Borrell, High Representative of the European Union, statement to the extraordinary meeting of the OSCE Permanent Council, 24 February 2022.

EN (source): “These are among the darkest hours for Europe since World War II. The European Union condemns in the strongest possible terms the invasion of Ukraine by armed forces of the Russian Federation. We demand President Putin to cease Russian military operations immediately and unconditionally withdraw all forces and military equipment from the entire territory of Ukraine.”

UK (target, as delivered): «Це одні з найтемніших часів для Європи… // з часів Другої світової війни. // Європейський Союз… найрішучішим чином засуджує… // вторгнення в Україну збройних сил Російської Федерації. // Ми вимагаємо від президента Путіна… // негайно припинити російські військові дії… // та беззастережно вивести всі війська і військову техніку… // з усієї території України.»

Regulatory point: the source contains a non-canonical complementation pattern (“demand somebody to do something”), which has no direct Ukrainian equivalent. The interpreter re-encodes it with the standard Ukrainian government pattern (вимагати від когось + infinitive), and so resolves a structural mismatch without altering illocutionary force. The three-sentence source is redistributed across eight delivery units, so that each clause boundary coincides with a prosodic break.

Micro-episode 2. Information packaging (fronted temporal predicate and embedded quotation)

Source: Petro Poroshenko, President of Ukraine, address to a joint meeting of the United States Congress, 18 September 2014.

EN (source): “And it is time for all the people of goodwill to rephrase John Kennedy’s words from over 50 years ago: ‘I am a Crimean Tatar’—and there is nothing that would make me give up my freedom.”

UK (target, as delivered): «Настав час для всіх людей доброї волі… // перефразувати слова Джона Кеннеді… сказані понад п’ятдесят років тому: // “Я — кримський татарин”… // і немає нічого… що змусило б мене відмовитися від своєї свободи.»

Regulatory point: the English impersonal construction (“It is time for X to Y”) is rendered with a fronted perfective predicate (настав час), which preserves the rhetorical emphasis while avoiding a clause-initial expletive that Ukrainian does not license. The embedded quotation is isolated in its own delivery unit, which protects the citation boundary under time pressure.

Micro-episode 3. Ellipsis resolution in a contrastive predication

Source: Petro Poroshenko, general debate of the seventy-second session of the United Nations General Assembly, 20 September 2017.

EN (source): “Russia is not a contributor to the international security, but its biggest threat.”

UK (target, as delivered): «Росія не є гарантом міжнародної безпеки… // вона є її найбільшою загрозою.»

Regulatory point: the English antithesis relies on gapping, with the copula elided in the second conjunct. Ukrainian tolerates such gapping far less readily in formal oral delivery, and the interpreter resolves the ellipsis by restoring an explicit subject and copula (вона є) in a separate delivery unit. The intervention adds no propositional content; it converts a compressed source structure into two fully specified predications.

English institutional discourse frequently encodes stance, evaluation, and agency in compact forms that cannot be transferred into Ukrainian without risking pragmatic escalation or loss of appropriateness. Interpreters must therefore choose between literal rendering and controlled recalibration (e.g., mitigation, de-agentivisation, generalisation) under severe time constraints. These conditions create recurrent trigger zones in which regulatory intervention becomes both visible and consequential, which makes English–Ukrainian SI a high-yield setting for modelling regulation as an online control process (House, 2015; Setton & Dawrant, 2016).

2.5. Data structure and sampling logic

To capture metacognitive regulation as online supervision, the dataset should preserve temporal and contextual variability. The recommended design is a time-aligned corpus of source speeches and their target renditions, sampled across (i) rate bands, (ii) density bands, and (iii) discourse types (institutional, diplomatic, crisis-related), because MR is expected to surface primarily under shifting demands (Salaets & Brône, 2023; Zhu & Aryadoust, 2022). The unit of analysis is the event window around a destabilising moment (see Section 2.7), not the full speech, since regulation is episodic and threshold-driven.

2.6. Transcription, time alignment, and segmentation

The core requirement is time-coded alignment between source and target streams. Transcripts are produced with consistent conventions for pauses, truncations, and overt repairs; both channels are then aligned to enable EVS estimation and local timing measures (Guo & Han, 2024; Stewart et al., 2018).

Segmentation is performed on two levels:

- Macro-segmentation into discourse phases (opening framing, argumentation, enumerations, closure), because regulatory demands often cluster in predictable rhetorical zones.
- Micro-segmentation into short, analytically stable units (e.g., clause-sized or idea-unit segments), which is necessary for modelling EVS fluctuation and local repairs without smoothing away the dynamics (Janikowski & Chmiel, 2025; Magnifico & Defrancq, 2019).

Segmentation must be *consistent across annotators*, otherwise annotation variability may be misinterpreted as regulatory behaviour.

2.7. Trigger definition

MR episodes are identified by the presence of triggers, that is, detectable stressors that increase the probability of instability. Triggers should be operationalised in advance and coded explicitly. A workable trigger set includes:

- Rate spikes: local increases in words-per-minute within a sliding window (Zhu & Aryadoust, 2022).
- Terminological clustering: short stretches with high density of domain terms (institutional or technical).
- Syntactic packing: segments with embedded clauses or long pre-modified noun phrases, which are known to influence EVS and production stability (Collard & Defrancq, 2019a; Janikowski & Chmiel, 2025).
- Pragmatic risk markers: accusations, demands, categorical attributions, face-threatening formulations, that is, items that typically invite mitigation or stance recalibration in institutional settings (Salaets & Brône, 2023).
- Platform-related disturbance (for remote settings): audio delay, unstable video access, or reduced environmental cues, because such conditions reshape monitoring reliability and reported cognitive strain (Salaets & Brône, 2023; Zhu & Aryadoust, 2022).

Triggers function as selection criteria for identifying locations where regulation is most likely to occur, and are not explanatory variables in the analysis.

2.8. Intervention coding: what counts as regulatory action

Within each trigger window, annotators code whether the interpreter produces an intervention, understood as a structured adjustment that plausibly reflects supervisory control. For MR modelling, interventions are coded in four categories.

Operationally, an item is coded as a regulatory intervention only when three diagnostic criteria are met: (i) the intervention is temporally aligned with an identified trigger window; (ii) it preserves the propositional core, that is, it does not constitute accidental omission or content distortion; and (iii) it is followed by a stabilisation signature in the post-trigger window. Items failing any criterion are excluded from the regulation count.

(A) EVS re-timing.

Not mean EVS alone, but *patterned shifts* in lag that coincide with triggers and are followed by re-stabilisation. Automated EVS methods are useful here because they capture micro-variation more reliably across larger datasets (Guo & Han, 2024).

(B) Repair management.

Repairs are coded by type and timing: early micro-adjustments versus late disruptive repairs. The assumption is that repair *profiles* reveal monitoring and control choices, not that *more repair is worse* (Magnifico & Defrancq, 2019).

(C) Controlled compression and restructuring.

Compression is coded as an intentional load-management move when it aligns with triggers and preserves propositional structure. This includes summarising, generalisation, and omission-with-compensation patterns. Controlled compression is distinguished from accidental omission by the three criteria above (trigger alignment, propositional preservation, post-event stabilisation).

(D) Pragmatic recalibration.

Mitigation, de-agentivisation, evidential hedging, and stance softening are coded when they occur under pragmatic-risk triggers and function as stabilising adaptations, especially in institutional registers (Salaets & Brône, 2023). Pragmatic recalibration is distinguished from ordinary rephrasing by its alignment with a pragmatic-risk trigger and its discourse-level function (force mitigation, agency shift, or evidential framing) rather than mere lexical substitution.

2.9. Stabilisation criterion and MR episode boundaries

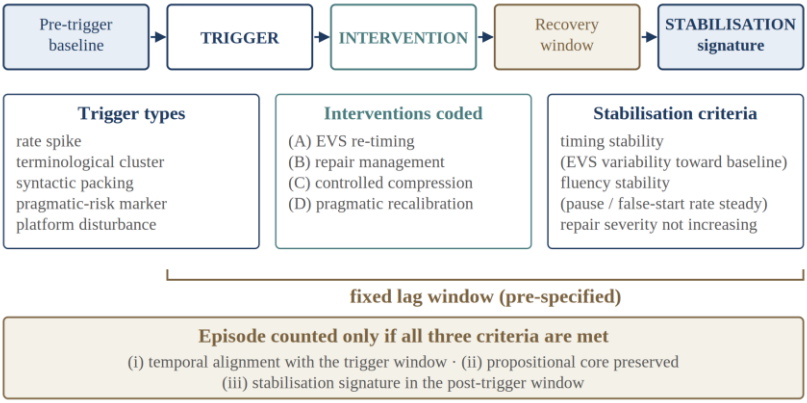
An MR episode is only counted when an intervention is followed by stabilisation within a pre-specified lag window (see Figure 2). Stabilisation is operationalised as a return to a baseline band on at least two dimensions:

- timing stability (EVS variability returning toward baseline), and

- fluency stability (pause/false start rate not escalating), with repair severity not increasing.

This is important methodologically. Without a stabilisation criterion, ordinary performance fluctuation may be mislabelled as regulation.

Figure 2. Episode-based operationalisation of metacognitive regulation in English–Ukrainian SI: triggers elicit regulatory interventions that are validated through stabilisation signatures within a fixed lag window.



2.10. Reliability and statistical modelling

Because MR coding involves judgement (especially for pragmatic recalibration and controlled compression), the pipeline must include reliability checks. A standard approach is double-coding a subset of the data and reporting agreement for categorical decisions (e.g., intervention present/absent; intervention type), alongside consistency for continuous measures (e.g., EVS estimates). Work that operationalises repairs as norm-related behaviour in SI shows why reliability checks are essential: the interpretation of repair depends heavily on coding discipline (Magnifico & Defrancq, 2019). Inter-coder agreement was established on a double-coded subset (≥ 20%) of episodes using Cohen's κ, with disagreements reconciled by codebook-guided discussion; the coefficient itself is reported with the inferential analysis and is not presented here (see Section 4.9).

For analysis, MR indicators are best modelled with multilevel designs (segments nested in interpreters, nested in texts), because both interpreter-specific and text-specific variance are substantial in EVS-related phenomena (Collard & Defrancq, 2019a; Janikowski & Chmiel, 2025). Where event windows are used, event-based

modelling can estimate which triggers predict which interventions, and which interventions most strongly predict stabilisation.

To show how the MR logic maps onto English–Ukrainian SI, we present three transcribed episodes from the corpus, following the conventions set out in Section 2.4. Source wording has been checked against the primary record in each case: the verbatim transcript of the United States Congress, the audio record of the United Nations media library, or the issuing institution's published text of the statement. All three source speeches were delivered in English; segments whose English text is a translation of a speech delivered in another language are excluded (see Section 4.2).

Example 1. Parenthetical insertion and enumeration under evaluative load

Source: Joseph R. Biden, Vice-President of the United States, address to the fifty-first Munich Security Conference, 7 February 2015.

EN (source): "We have seen, as much as we would not like to see, increased repression at home, including the barbarous practice of using psychiatric institutions to quell dissent, silencing of the mothers of soldiers deployed in Ukraine; …"

UK (target, as delivered): «Ми бачимо… як би нам не хотілося цього бачити… // посилення репресій всередині країни… // включаючи варварську практику… використання психіатричних закладів… для придушення інакодумства… // та змушування до мовчання матерів солдатів… відправлених в Україну.»

Regulatory point: the parenthetical is retained in situ, neither deferred nor dropped, and the first two members of the enumeration that follows are distributed across three delivery units, with internal breaks inside the longest constituent; the excerpt is cut at the third semicolon, and the remaining members of the list are not analysed here. The evaluative lexis (barbarous / варварський) is transferred without attenuation, so the intervention here is temporal and structural, not pragmatic.

Example 2. Gerund chain under agentive accusation

Source: Petro Poroshenko, general debate of the seventy-second session of the United Nations General Assembly, 20 September 2017.

EN (source): "Stealing other nation's land, kidnapping people, conducting hidden war, downing civilian aircraft, spreading lies globally; is this a kind of behavior we expect from a permanent Security Council member?"

UK (target, as delivered): «Захоплення земель інших держав… // викрадення людей… // ведення прихованої війни… // збиття цивільних літаків… //

поширення брехні по всьому світу… // чи саме такої поведінки ми очікуємо… // від постійного члена Ради Безпеки?»

Regulatory point: each English gerund is rendered by a deverbal noun (захоплення, викрадення, ведення, збиття, поширення). The categorial shift is systematic across all five members of the chain and is the standard Ukrainian equivalent of gerundial enumeration; it also leaves the agent unexpressed, so that the accusation is conveyed without the interpreter attributing it to a named actor. Each member occupies its own delivery unit, which stabilises the parallel structure across a five-part list. This passage immediately precedes the sentence analysed as Micro-episode 3; the two are treated as separate episodes because they present distinct trigger types (enumerative packing under accusation, and gapping in a contrastive predication) and are separated by a prosodic boundary in the annotation.

Example 3. Syntactic packing with a delayed passive predicate

Source: Petro Poroshenko, address to a joint meeting of the United States Congress, 18 September 2014.

EN (source): "… Ukraine gave up the third largest nuclear potential in exchange for security assurance and was stabbed in the back by one of the countries who gave her that assurance."

UK (target, as delivered): «Україна відмовилася від третього за потужністю ядерного арсеналу… // в обмін на гарантії безпеки… // і отримала удар у спину… // від однієї з країн, яка ці гарантії надала.»

Regulatory point: the English passive with a postposed agent phrase and a following relative clause is restructured as an active predication (отримала удар у спину), which allows the agent phrase to be appended without a clause-level restart. The relative clause is reordered so that the verb reaches the end of the unit, matching Ukrainian information flow. Segmentation into four units keeps each syntactic commitment short. The excerpt begins after the matrix clause that introduces the complement in the source (I just want to call your attention to the fact that…).

These episodes illustrate a practical point: in SI, metacognitive regulation often appears as small, timely interventions that prevent destabilisation from propagating across segments.

Two observations follow from the transcribed material. It comprises six episodes drawn from four speech events, and illustrates the repertoire without being representative of the coded set. First, the interventions documented here are predominantly structural: syntactic normalisation, ellipsis resolution, categorial shift, and consistent segmentation at clause boundaries. Propositional content and

illocutionary force are preserved in every case, including under categorical accusation and high-valence evaluation. Second, regulation is visible primarily in the placement of delivery boundaries: the interpreter breaks the stream before long or structurally committed constituents rather than inside them. Claims about pragmatic recalibration in the present study therefore rest on the coded episode set as a whole, and not on these illustrative transcripts, in which force-modifying interventions do not occur.

3. Research questions and hypotheses

This study examines metacognitive regulation as a higher-order supervisory mechanism in English–Ukrainian simultaneous interpreting. Contemporary cognitive accounts increasingly describe interpreting as a form of controlled multitasking in which language control and processing control must be coordinated online (Dong & Li, 2020). The evidence base on cognitive load and timing behaviour in SI suggests that stability cannot be reduced to capacity alone: temporal parameters fluctuate systematically with discourse and interpreter factors (Janikowski & Chmiel, 2025; Plevoets & Defrancq, 2016), working memory relationships are variable across studies and moderators (Mellinger & Hanson, 2019), and neurocognitive data indicate strong engagement of domain-general control networks during SI (Babcock & Vallesi, 2017; Hervais-Adelman et al., 2015).

At the same time, interpreting studies increasingly provide tools for measuring regulation-relevant behaviour at scale. Automated EVS estimation enables the modelling of fine-grained recovery dynamics, without recourse to coarse averages (Guo & Han, 2024; Stewart et al., 2018). Repair behaviour can be treated as a monitoring-relevant trace and not as a purely error-driven event, especially when coded by timing and disruption (Magnifico & Defrancq, 2019). Technology-mediated settings such as distance and remote interpreting, finally, show how changes in task ecology can intensify cognitive load and alter monitoring conditions, which makes internal regulation more consequential (Salaets & Brône, 2023; Zhu & Aryadoust, 2022).

Within English–Ukrainian SI, the need for supervision is often amplified by direction-specific demands: English stance marking, agency attribution, and evaluative force frequently require rapid decisions in Ukrainian rendering to preserve communicative intent and institutional appropriateness. This study therefore treats metacognitive regulation as an episode-based phenomenon: it becomes visible when the interpreter detects destabilisation (a trigger), initiates a structured intervention, and restores stability.

3.1. Research questions

RQ1. In English–Ukrainian SI, does metacognitive regulation (operationalised via event-based indicators: EVS recovery dynamics, repair timing/severity, trigger-aligned compression, and pragmatic recalibration) predict interpreting quality and stability under fluctuating task demands?

RQ2. Which trigger types (speech-rate spikes, information/terminological density, syntactic packing, pragmatic-risk markers, and, where applicable, platform disturbance) most reliably elicit regulatory interventions in English–Ukrainian SI?

RQ3. Is metacognitive regulation in English–Ukrainian SI primarily associated with recovery dynamics (rapid stabilisation after perturbation) rather than with global averages (e.g., mean EVS) or raw error counts?

RQ4 (training-oriented). Do metacognitive pedagogical interventions (e.g., criteria-based or standards-based self-assessment) strengthen regulatory signatures in English–Ukrainian SI (earlier interventions, less disruptive repairs, faster stabilisation)?

3.2. Hypotheses

H1. The indicator set (EVS recovery, repair profile, trigger-aligned compression, pragmatic recalibration) will explain unique variance in expert-rated quality and stability outcomes in English–Ukrainian SI beyond baseline timing and fluency measures (e.g., mean EVS, overall pause rate), with the strongest effects in trigger-rich segments (Dong & Li, 2020; Mellinger & Hanson, 2016).

H2 (trigger–intervention specificity). Trigger types will show differentiated mappings to interventions:

H2a: Rate spikes and syntactic packing will preferentially predict EVS re-timing and controlled compression, because time pressure forces the reallocation of planning and buffering resources (Guo & Han, 2024; Janikowski & Chmiel, 2025).

H2b: Density and terminological clustering will preferentially predict structured reordering and condensation, which protect propositional coherence while reducing production burden (Plevoets & Defrancq, 2016; Stewart et al., 2018).

H2c: Pragmatic-risk markers will preferentially predict pragmatic recalibration (e.g., mitigation, de-agentivisation, evidential neutralisation), especially in English–Ukrainian SI where stance and agency often require explicit restructuring.

H3 (stability and recovery). Stronger regulatory signatures will be associated with faster post-trigger recovery, operationalised as reduced EVS volatility and

fewer late disruptive repairs following trigger windows (Janikowski & Chmiel, 2025; Magnifico & Defrancq, 2019).

H4 (sensitivity to metacognitive training). Participants receiving structured metacognitive training (e.g., standards-based self-assessment) will demonstrate stronger regulatory signatures: earlier trigger detection, more selective repair profiles, more effective trigger-aligned compression, and improved stabilisation. This expectation follows interpreting-specific work conceptualising metacognition as a trainable component of interpreting competence (Fernández Bravo, 2019) and recent evidence that standards-based self-assessment can improve metacognitive strategy use and interpreting performance (Mei & Yang, 2026).

3.3. Practical and applied relevance for English–Ukrainian SI

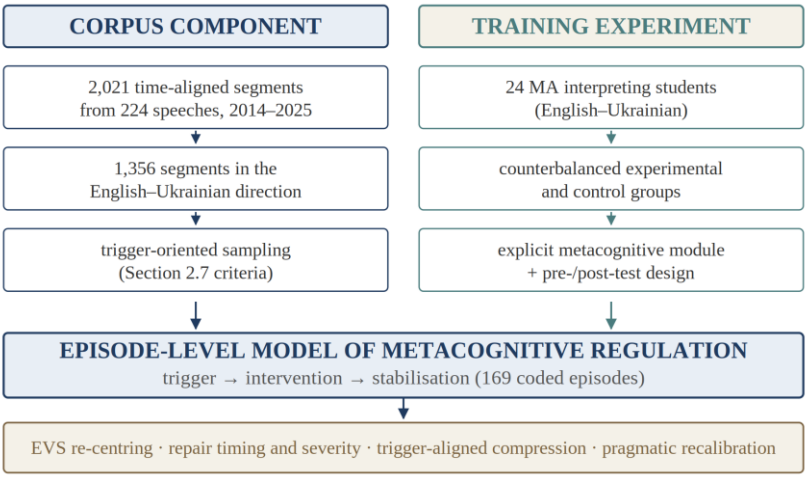
These research questions have applied consequences. If the proposed indicator set reliably captures how interpreters stabilise performance under pressure, it can support (a) diagnostic feedback in training, (b) profile-based coaching, and (c) evidence-informed adaptation for technology-mediated interpreting settings (Salaets & Brône, 2023; Zhu & Aryadoust, 2022). The English–Ukrainian focus adds applied value because direction-specific pragmatic and structural differences can be modelled as trigger conditions that systematically recruit regulation, instead of being treated as idiosyncratic difficulty.

4. Method

4.1. Design overview

The study used a mixed design combining (a) a corpus-based component of English–Ukrainian simultaneous interpreting (henceforth English–Ukrainian SI) in institutional and crisis-relevant discourse, and (b) a training experiment with MA-level interpreting students (see Figure 3). The corpus component was used to model trigger–intervention–stabilisation patterns in ecologically valid settings, while the experimental component was used to test whether metacognitive instruction strengthens regulatory signatures under controlled conditions. The analytic unit was a trigger-centred episode window (pre-trigger → trigger → recovery), with 169 episodes identified and coded across the corpus. This logic follows current methodological recommendations to integrate naturalistic performance data with training-based evidence when modelling cognitive mechanisms in interpreting (Fantinuoli, 2018; Mellinger & Hanson, 2016; O'Brien & Mellinger, 2025).

Figure 3. Mixed design (English–Ukrainian SI): corpus-based evidence of regulation signatures combined with a training experiment targeting metacognitive monitoring and strategy switching.



4.2. Corpus component: data scope and sampling

The corpus comprises 2,021 time-aligned segments drawn from 224 speeches delivered between 2014 and 2025, distributed across five discourse types: diplomatic and security communication (UN- and NATO-related institutional settings), parliamentary discourse, economic and institutional events, humanitarian statements, and military-security addresses. Of these segments, 1,356 are in the English–Ukrainian direction. Segments were retained for analysis only where the source speech was demonstrably delivered in English, the source wording was verified against the primary institutional record, and a simultaneous Ukrainian rendition was available in time-aligned ELAN annotation; segments whose English text proved to be a written translation of a speech delivered in another language were excluded, as were written communiqués for which no interpreted delivery exists. Ukrainian is not a working language at any of the institutions from which the source speeches are drawn, so the Ukrainian renditions are not institutional booth output. They are simultaneous renditions produced for Ukrainian-language broadcast coverage of the events concerned, and are therefore media-booth performances. This is a boundary condition on the corpus: working conditions, monitoring cues and audience expectations in media simultaneous interpreting differ from those in a conference booth, and the findings are framed accordingly. The corpus was stratified by year, genre, and communicative setting to capture variability in rate, density, and pragmatic risk. This stratification is essential because temporal measures such as lag

(EVS) are known to vary with text properties, delivery conditions, and interpreter-specific factors, and do not remain constant across a speech (Plevoets & Defrancq, 2016; Seeber, 2017; Setton & Dawrant, 2016).

From the full corpus, an analytic subcorpus was sampled for intensive annotation. Sampling was trigger-oriented: segments were selected to include high-probability destabilisation conditions (rate spikes, terminological clustering, syntactic packing, pragmatic-risk markers), because metacognitive regulation is expected to be most visible in those windows (Gile, 2009; Seeber, 2017). The unit of analysis is the episode window (see Section 4.8), not the whole speech. The analytic subcorpus was drawn from the English–Ukrainian segments by applying the trigger criteria set out in Section 2.7; of the windows so identified, 169 yielded a complete trigger–intervention–stabilisation record and constitute the coded episode set analysed below.

4.3. Experimental component: participants

Twenty-four (n = 24) MA students of interpreting participated (English–Ukrainian; 18 female, 6 male; age range 21–28, M = 23.4), typically in the first and second year of study, with proficiency spanning B2–C2 (CEFR). Participants were assigned to experimental and control groups in a counterbalanced manner. They were trained within a regular SI course framework and assessed in pre-/post-test conditions. This participant profile reflects common designs in interpreter training research, in which cognitive skills are examined as trainable mechanisms (Bernardini et al., 2016; Moser-Mercer, 2015; Sandrelli, 2015).

4.4. Training and task structure (experimental component)

Training was delivered in intensive SI practice cycles with consistent time pressure (short interpreting blocks separated by brief breaks) and repeated exposure to institutional and crisis-relevant discourse. The pedagogical intervention added an explicit metacognitive module: trainees received structured prompts and criteria for monitoring overload, diagnosing risk points, and switching strategies (e.g., controlled compression, EVS re-timing, pragmatic recalibration) instead of relying exclusively on error-based feedback. This aligns with work arguing that expertise development in interpreting is shaped by deliberate monitoring routines and goal-directed regulation (Muñoz Martín, 2016; O'Brien & Mellinger, 2025; Risku, 2002).

4.5. Materials (corpus and experiment)

Speech materials are English-language institutional and public addresses relevant to English–Ukrainian SI practice (political/diplomatic speeches, press statements, crisis briefings). Materials were balanced by:

— speech rate (categorised into low/medium/high bands),

— terminological density (low/medium/high),

— syntactic complexity (lower vs higher packing),

— pragmatic risk (neutral vs confrontational vs diplomatically sensitive),

— emotional salience (neutral vs affectively loaded).

Such balancing is necessary because rate, density, and pragmatic risk can jointly increase processing costs and modify delivery patterns (Defrancq & Fantinuoli, 2021; Korpal, 2017; Seeber, 2017).

4.6. Recording, transcription, and alignment

All experimental performances were audio-recorded and transcribed; corpus recordings were transcribed where needed. Transcripts were time-aligned to the audio to enable lag estimation and event-level annotation. Alignment and annotation were conducted with a tier-based tool suitable for time-coded linguistic data (e.g., ELAN; Wittenburg et al., 2006).

Segmentation was applied on two levels:

— macro-level: discourse phases (openings, argumentation, enumerations, closures),

— micro-level: clause/idea units, used for EVS estimation, repair coding, and trigger detection.

This two-level segmentation reduces the risk of conflating discourse structure with cognitive regulation effects (Plevoets & Defrancq, 2016; Setton & Dawrant, 2016).

4.7. Measures: timing, repairs, compression, pragmatic recalibration

The study operationalises metacognitive regulation using the four indicator families introduced in Sections 2.3 and 2.8, retaining the same labels (A)–(D):

(A) EVS re-timing. EVS is operationalised as the time lag between source onset and target onset at aligned segment boundaries. In addition to mean EVS, the analysis focused on EVS variability and post-trigger re-centring, because regulation is expected to appear as a stabilisation response and not as a static average (Seeber, 2017).

(B) Repair management. Repairs were coded by type and timing: false starts, restarts, substitutions, and late vs early repairs. The logic is that repairs reflect monitoring and control choices, and not only error frequency (Magnifico & Defrancq, 2019).

(C) Controlled compression and restructuring. Compression was coded as structured reduction (generalisation, summarising, re-ordering) and distinguished from accidental omission. Compression episodes counted as regulation-relevant only when aligned with triggers and followed by stabilisation (Muñoz Martín, 2016; Pym, 2013).

(D) Pragmatic recalibration. Pragmatic interventions include mitigation, de-agentivisation, evidential hedging, and stance moderation, where they preserve propositional meaning but reduce institutional risk. This component is particularly relevant for English–Ukrainian SI, where agency and evaluative force often require explicit reformulation to maintain appropriateness (House, 2015; Kádár & Haugh, 2013).

4.8. Trigger detection and MR episode definition

Metacognitive regulation is treated as event-based. An MR episode is defined when three elements co-occur:

— a coded trigger (rate spike, density cluster, syntactic packing, pragmatic-risk marker; and, where relevant, platform disturbance),

— a coded intervention (EVS re-timing, repair management, controlled compression, pragmatic recalibration),

— a stabilisation signature within a fixed lag window (return toward baseline bands for timing and fluency).

This structure follows the assumption that regulation is threshold-sensitive and becomes observable when routine processing is challenged (Gile, 2009; Seeber, 2017).

4.9. Quality assessment and rater protocol

Quality was assessed by three independent raters (two professional interpreters and one university lecturer in interpreting studies), all with at least five years of English–Ukrainian SI experience, using a scale aligned with professional training priorities (semantic accuracy, terminological adequacy, pragmatic appropriateness, delivery). Raters worked from written descriptors and anchor examples. Inter-rater agreement was calculated using Cohen's κ, and disagreements were reconciled by codebook-guided discussion. This approach is consistent with interpreting

assessment practices used in training research and competence-oriented programmes (Moser-Mercer, 2015; Pöchhacker, 2016).

4.10. Statistical analysis plan

Given the nested structure of the data (segments within interpreters, interpreters within texts/conditions), the analysis plan specifies multilevel modelling. Episode-level models are specified to test (i) which triggers predict interventions, and (ii) which interventions predict stabilisation. Predictive models are specified to test whether the indicator set (EVS recovery dynamics, repair timing/severity, trigger-aligned compression, pragmatic recalibration) explains variance in quality and stability measures beyond baseline timing averages, using within-interpreter comparisons across trigger and non-trigger windows (Mellinger & Hanson, 2016).

To accommodate the nested structure of the dataset (episodes within interpreters, interpreters within tasks), the quantitative summary is descriptive and model-guided; it is not confirmatory hypothesis testing. The primary outcome is episode stabilisation (binary: stabilised vs not stabilised within the predefined lag window), with EVS re-centring, repair timing/severity, compression/restructuring, and pragmatic recalibration entered as episode-level predictors. Where modelling is reported, mixed-effects logistic (for stabilisation) and mixed-effects linear models (for continuous timing measures) are used with random intercepts for interpreter and speech/task, and fixed effects for trigger type. The present paper reports the descriptive episode-level layer only (Section 5.4). Model estimates, which would be given as β or odds ratios with 95% confidence intervals, are not presented here; the results reported below are accordingly to be read as descriptive associations within the observed episode set (N = 169), and not as effect estimates or causal claims. Inter-rater agreement for categorical codes was established as described in Section 4.9. All analyses are reproducible from the coded episode sheet and time-stamped alignment files.

4.11. Ethics

Participants in the experimental component provided informed consent, and recordings were anonymised. The corpus component draws on public addresses by public officials in institutional settings, and speakers are therefore identified by name, event and date, as required for source verification. Interpreters are not identified: their output is reported under anonymised codes, and no individual performance is attributable to a named professional. Corpus materials are handled in accordance with the rights and usage constraints attaching to the original broadcasts and institutional records.

5. Results

Note. In this paper we report results at the level of observable indicators (EVS dynamics, repair profiles, trigger-aligned compression, and pragmatic recalibration). We do not introduce a composite index.

Across the English–Ukrainian corpus, temporal coordination became more stable over time, and this stabilisation was not uniform across genres. The strongest shifts clustered in high-pressure institutional and crisis-adjacent settings, where interpreters faced dense content, rapid delivery, and pragmatic risk. This pattern is consistent with the long-standing claim that expertise in SI is expressed as adaptive control and not as a single global parameter (Gile, 2009; Seeber, 2017; Setton & Dawrant, 2016).

EVS dynamics. Mean EVS showed a downward shift across the 2014–2025 span, and in later-year samples EVS tended to re-centre faster after perturbations (rate spikes, packed noun phrases, enumerations). These year-on-year comparisons are descriptive and are confounded by changes in speaker, genre and interpreting arrangement across the period; they are reported as a trend in the material, not as evidence of development within interpreters. The more informative result concerns EVS volatility around triggers. Interpreters did not simply minimise EVS; they used it as a control parameter, expanding slightly when needed and then returning to a stable band. This interpretation matches recent work treating EVS as a context-sensitive variable shaped by multiple predictors and not as a fixed individual trait (Dong & Li, 2020; Janikowski & Chmiel, 2025; Plevoets & Defrancq, 2016).

Repair profiles. Repair behaviour shifted in a direction that is best described as selective monitoring. Later samples contained fewer disruptive late repairs (repairs that break syntactic commitments and restart long stretches) and more early micro-adjustments that preserve delivery continuity. That distribution matters because repair carries information about monitoring decisions under time pressure (Magnifico & Defrancq, 2019). In trigger windows, interpreters with more stable performance tended to avoid repair cascades by choosing earlier, cheaper corrections or by rerouting the plan before committing to a high-cost structure.

Trigger-aligned compression. Compression became more targeted rather than more frequent: concentrated in predictable overload zones (dense noun phrases, triadic lists, embedded clauses), and often followed by immediate fluency stabilisation (lower pause pressure; fewer late repairs). In SI, compression counts as a regulatory move when it is trigger-driven and function-preserving; random shortening does not (Muñoz Martín, 2016; Pym, 2013).

The results reported below are based on the analysis of 169 coded trigger-centred episodes, which constitute the empirical basis for the frequency snapshot and qualitative patterns discussed.

5.1. Pragmatic recalibration in English–Ukrainian

The coded episode set contains recurring cases in which interpreters reduce pragmatic escalation while maintaining propositional content, especially with evaluative judgements, categorical attributions, and agentive accusations. The transcribed episodes reproduced in Section 2 illustrate the structural side of the repertoire; the evidence for pragmatic recalibration in this section rests on the coded set as a whole. In English–Ukrainian SI, this is not merely a matter of stylistic preference. It works as a stabilising intervention that reduces the likelihood of late repairs, buys planning time, and maintains institutional appropriateness. The pragmatic literature helps explain why such recalibration is not peripheral in institutional speech: stance, agency, and face-management carry interactional consequences, and interpreters often regulate them under pressure (Dong & Li, 2020; House, 2015; Kádár & Haugh, 2013).

Table 1 integrates episode-level observations across the English–Ukrainian corpus, aligning temporal coordination (EVS), repair behaviour, compression strategies, and pragmatic adjustment within recurrent trigger conditions.

Skrylnyk, S. (2026). Metacognitive regulation as supervisory control in simultaneous interpreting assessment. *Current Trends in Translation Teaching and Learning E, 13.*
https://doi.org/10.51287/cttle20262

Table 1. Episode-level coordination of regulatory indicators in English–Ukrainian simultaneous interpreting.

de trigger	**al EN–UKR risk**	**behaviour**	**r behaviour**	**pression / ıcturing**	**natic adjustment**	**isation signature**
h-rate spike	ssing lag ulation	pike; rapid re- ng	micro-repair	egmentation	al stance preserved	nuous delivery
nological clustering	al overload	lightly extended	r avoidance	ive compression	tional equivalence	ed pause pressure
atic stance / agency	f escalation or over- tion	tabilised via pacing	r delayed or essed	nal compression	ation / de- visation	atic coherence
–aspectual exity	nitment / temporal gnment	drift; controlled nent	ntive repair	tual restructuring	al commitment ng	cy recovery
ric density	acy risk	orary EVS own	acy-driven repair	ural framing (“of …”)	al factual tone	prevention
ctic packing	yntactic itment	drift; re-alignment	segmentation	e splitting	e–rheme reordering	ery stabilised
thetical insertions	ory load increase	buffered	r suppression	risation	nation prioritisation	start cascade
rm disturbance te SI)	uncertainty	naintained rvatively	r suppressed	/ minimal	risk formulation	nuity maintained

The table shows that stabilisation comes from coordinated adjustments across timing, repair management, structural compression, and pragmatic recalibration, and not from optimising any single parameter. This alignment explains why global averages such as mean EVS or overall error rates fail to capture performance stability in English–Ukrainian simultaneous interpreting.

5.2. Experimental results: effects of metacognitive training on English–Ukrainian SI performance

The training component tested whether making monitoring criteria explicit changes how trainees manage instability during SI. The clearest improvements were in how trainees recovered when the input became difficult, and not in the flawlessness of the output. Findings reported in this section refer to the experimental subsample (n = 24) and are presented as associations rather than causal effects; further replication with larger samples is required.

Quality outcomes. Post-training performance was associated with descriptive gains in clarity and precision, alongside a marked reduction in perceived and behavioural indicators of cognitive strain. This pattern aligns with the broader claim in interpreter education research that improvement is often expressed as stability and control rather than as a simple reduction of all errors (Moser-Mercer, 2015; Setton & Dawrant, 2016).

Temporal control and recovery. After training, participants displayed tighter temporal coordination within trigger windows and faster return to baseline after perturbations. This result fits the view that attentional control in SI involves online calibration of effort and timing, and not merely speed (Dong & Li, 2020; Seeber, 2017). It also echoes methodological work arguing that fine-grained EVS measurement is needed to capture regulation, because global means can hide recovery dynamics (Guo & Han, 2024).

Repairs as regulated behaviour. The most interpretable shift was qualitative: trainees reduced disruptive late repairs and relied more on early micro-corrections or pre-emptive rerouting (e.g., abandoning a risky syntactic plan early). In line with Magnifico and Defrancq (2019), repair here works as an indicator of monitoring strategy under constraint, and not as a count of mistakes.

Compression and pragmatic decision-making. Training effects were most visible in two families of interventions:

— trigger-aligned compression (students learned when to condense without damaging the propositional core);

— pragmatic recalibration in SI (mitigation, controlled stance, de-agentivisation in institutionally sensitive segments).

Both changes point to supervisory decision-making: the trainee manages risk and effort while maintaining communicative function (Muñoz Martín, 2016; Risku, 2002).

5.3. Projected implications from the combined evidence (what the results support)

The corpus and experimental results together support three claims that can be tested and extended in future work:

— Metacognitive regulation is observable in English–Ukrainian SI through converging behavioural traces: EVS recovery patterns, repair timing, trigger-aligned compression, and pragmatic recalibration.

— Regulation is episodic, becoming most visible in trigger windows; this is why event-based modelling is methodologically appropriate for SI (Guo & Han, 2024; Janikowski & Chmiel, 2025).

— Regulation is trainable, and training effects appear first in stability and recovery rather than in uniform accuracy gains, which matches competence-oriented approaches to interpreter education (Moser-Mercer, 2015; Setton & Dawrant, 2016).

5.4. Frequency snapshot

To complement the episode-level qualitative analysis, a minimal frequency summary was compiled across the coded episode set. The analytic unit was a trigger-centred episode window (pre-trigger → trigger → recovery), annotated for (1) EVS destabilisation and re-centring, (2) repair behaviour (timing and cascade risk), (3) compression or restructuring, and (4) pragmatic recalibration. Across 169 coded episodes, stabilisation was most consistently associated with coordinated adjustments across multiple indicators, and not with isolated parameter optimisation. Table 2 is a transparency layer showing how often episode-level regulatory patterns recur across the dataset; it is not an outcome metric.

Table 2. Frequency snapshot of indicator co-occurrence across 169 coded trigger-centred episodes (English–Ukrainian SI).

ıtor (episode-level coding)	**t (n)**	**episodes**
lestabilisation observed (spike or drift)		
e-centring within recovery window		
epair initiated (micro- or self-repair)		

ıtor (episode-level coding)	**t (n)**	**episodes**
r cascade avoided (no restart chain)		
ression / restructuring applied		
ıatic recalibration (stance/agency, mitigation, framing)		
currence: EVS adjustment + compression		
currence: EVS adjustment + repair		
currence: compression + pragmatic recalibration		

The frequency snapshot indicates that episode stabilisation in English–Ukrainian simultaneous interpreting is typically achieved through coordinated adjustments across timing, repair management, and restructuring. This supports the central claim that metacognitive regulation operates as a supervisory layer aligning multiple local interventions.

6. Discussion

The study's main contribution is a clearer explanatory link between observable behaviour and online control in simultaneous interpreting. Classic and contemporary accounts describe SI as a coordination problem under severe capacity constraints (Gile, 2009; Seeber, 2017). More recent modelling explicitly distinguishes language control from processing control, and argues that interpreting depends on attentional control over both systems, deployed dynamically under time pressure (Dong & Li, 2020). The present indicator-level results fit that trajectory: they suggest that stability is achieved through trigger-sensitive regulation, that is, through timely adjustments in temporal coordination, repair management, and reformulation choices, rather than through uniformly lower lag or uniformly fewer errors.

Two main implications follow.

First, EVS should be treated as a control variable, not a static trait. The corpus patterns and experimental shifts are better explained by *recovery dynamics* (how quickly timing returns to a stable band after perturbation) than by mean EVS alone. This view aligns with evidence that EVS fluctuates systematically with text- and interpreter-specific predictors and individual variation (Janikowski & Chmiel, 2025) and with methodological developments that make such micro-dynamics measurable at scale (Guo & Han, 2024; Stewart et al., 2018).

Second, repairs should not be treated solely as errors. When analysed by timing and disruption cost, repairs become traces of monitoring and control decisions. The shift from late disruptive repairs to earlier micro-corrections is consistent with a

normative and functional interpretation of self-repair in SI (Magnifico & Defrancq, 2019). This strengthens the case for treating repair profiles as regulation-relevant data.

This direction foregrounds regulation because interpreters frequently encounter compact English stance-marking and agency attribution that cannot be mirrored in Ukrainian without pragmatic side-effects. In institutional discourse, compact evaluative and agentive formulations such as superlative condemnation formulae, categorical predications and agentive gerund chains can force the interpreter to decide, within seconds, whether to keep the force, mitigate it, shift agency, or adjust evidential framing. The corpus-based evidence that pragmatic recalibration clusters around pragmatic-risk triggers suggests that such choices are not incidental; they work as stability-preserving interventions.

Pragmatics-oriented work makes a compatible point: meaning in institutional communication is inseparable from illocutionary force, stance, and interpersonal evaluation, all of which must be actively managed at the discourse level in translation and interpreting (House, 2015). Current work treating (im)politeness and interpersonal evaluation as emergent and context-sensitive rather than lexically fixed helps explain why interpreters may legitimately tone down formulations while keeping propositional content (Haugh, 2021).

In practical terms, English–Ukrainian SI offers observable episodes where regulation is especially likely: mitigation under face-threatening moves, de-agentivisation under accusation, controlled generalisation under density, and early rerouting under syntactic packing. These are the sites where training and assessment can be made more diagnostic.

6.1. Stability management

The experimental component suggests that metacognitive interventions primarily improve how trainees manage instability during SI, and not only their end-state accuracy. This pattern is consistent with competence-oriented accounts of interpreter development, in which improvements often manifest as better strategic control and smoother recovery (Setton & Dawrant, 2016).

In this case, the training effects (descriptive gains in clarity and precision and a marked reduction in cognitive load indicators within the experimental subsample, n = 24) fit a regulation-based interpretation: trainees appear to learn *when* to compress, *when* to avoid high-cost repairs, and *how* to preserve communicative function under time pressure. This finding is also in line with recent interpreting pedagogy research showing that standards-based self-assessment can alter metacognitive strategy use and improve interpreting performance (Mei & Yang, 2026). Metacognition in SI is

therefore best operationalised as criteria-guided decision-making under constraint, and not as abstract introspection.

6.2. Technology-mediated SI as a stress test for regulation

Distance and remote SI provide a natural stress test because they can degrade external monitoring cues and add additional sources of cognitive load. A synthetic review of cognitive load in distance interpreting shows how task configuration and measurement choices shape observed load effects and performance outcomes (Zhu & Aryadoust, 2022). At the experiential and workplace level, interpreters report altered control, fatigue, and coordination challenges on video-based interpreting platforms (Salaets & Brône, 2023). When such conditions are present, regulation should become more salient: interpreters may rely more on internal monitoring, earlier compression, and stricter repair discipline to prevent cascades.

This also suggests a methodological point: regulation effects are likely to be underestimated if studies rely only on global scores. Trigger-window analysis (rate spikes, dense segments, pragmatic-risk zones) is more likely to capture the mechanisms that make SI resilient, especially in technology-mediated settings. These findings also delineate a boundary for technology-assisted interpreting: while automation may support timing and terminology, episode-level regulatory decisions remain fundamentally human-centred (Mellinger & Hanson, 2025).

6.3. Limitations and future directions

Five main limitations should be acknowledged.

- Directionality and generalisability. The results are anchored in English–Ukrainian SI. While many mechanisms should generalise, the pragmatic-risk profile and reformulation demands may differ across language pairs and institutional cultures.
- Operational boundaries. Indicator-level operationalisation improves testability, but some coding decisions (e.g., controlled vs accidental compression; pragmatic recalibration) still require well-defined annotation protocols and reliability checks. The approach remains robust only when annotation criteria are explicit and replicable (Magnifico & Defrancq, 2019).
- Mechanism-level inference. Behavioural indicators support a regulation interpretation, but they do not directly measure internal monitoring states. Future work can triangulate with process measures (fine-grained EVS estimation, automated alignment, multimodal timing) and validated cognitive-load instruments in distance settings (Guo & Han, 2024; Zhu & Aryadoust, 2022).
- Corpus provenance. The Ukrainian renditions are media-booth performances, because Ukrainian is not a working language at the institutions from which the source speeches are drawn (Section 4.2). Working conditions, monitoring cues and

audience expectations differ between the two settings, and the extent to which the regulatory patterns reported here transfer to conference-booth work remains an open question.

- Illustrative coverage. The transcribed episodes reproduced in Section 2 are drawn from four speech events and document structural interventions. Pragmatic recalibration is therefore supported by the coded frequencies but not by reproduced transcript evidence, and this asymmetry should be resolved in future reporting.

Regulatory interventions generally stabilise performance, but they may also introduce trade-offs, such as pragmatic over-mitigation or information loss under extreme time pressure.

7. Conclusion

This article examined metacognitive regulation as an episode-level supervisory process in English–Ukrainian simultaneous interpreting, focusing on how interpreters stabilise delivery when local destabilisation is detected. The analysis suggests that regulatory success shows up in timely, trigger-sensitive coordination across several observable dimensions: temporal adjustment (EVS re-centring), repair management, compression or restructuring, and pragmatic recalibration. Uniformly low processing lag and minimal repairs are poor indicators of it. In English–Ukrainian SI, these adjustments are particularly consequential in stance- and agency-sensitive segments, where pragmatic choices can preserve institutional force while preventing escalation or misattribution.

Across 169 coded episodes, the frequency snapshot indicates that stabilisation most often coincides with coordinated indicator patterns and not with isolated parameter optimisation. EVS destabilisation is a defining feature of the trigger-centred episode window, while EVS re-centring within the recovery window occurs in a substantial majority of episodes. Compression or restructuring and repair behaviour also recur frequently, and pragmatic recalibration clusters in episodes with elevated pragmatic risk. Co-occurrence patterns further support the interpretation that timing adjustment tends to operate in combination with restructuring and, in many cases, with repair management, and not as a standalone stabilising mechanism. These frequencies are reported as a transparency layer for recurrence and alignment, not as composite performance scores or causal evidence.

7.1. From a research perspective

The episode-based approach outlined here enables more accurate modelling of regulatory behaviour across language pairs and interpreting modalities, without relying on composite indices or global averages. Specifically:

- SI models should incorporate recovery dynamics as a core outcome variable, alongside accuracy and mean timing measures (Dong & Li, 2020; Janikowski & Chmiel, 2025).
- EVS research benefits from automated and semi-automated approaches that allow analysis at scale and preserve micro-variation (Guo & Han, 2024; Stewart et al., 2018).
- Repair research should distinguish between costly late repairs and early micro-adjustments, since they imply different monitoring strategies (Magnifico & Defrancq, 2019).

7.2. From a theoretical perspective

The findings contribute to current cognitive models of simultaneous interpreting by specifying where regulation becomes observable. Metacognitive regulation does not appear as constant monitoring but as episodic intervention triggered by local destabilisation. This helps explain why mean EVS or total error counts often fail to differentiate stable expert performance from unstable delivery: what matters is not how low EVS is on average, but how efficiently interpreters re-centre timing and limit repair cost once overload is detected. The episode-based framework proposed here thus offers a concrete bridge between abstract notions of monitoring and empirically observable behaviour.

The English–Ukrainian language pair provides a particularly revealing testing ground for this framework. Recurrent asymmetries in stance marking, agency attribution, and evaluative force create pragmatic risk zones in which literal transfer can destabilise delivery or escalate institutional meaning. The coded occurrence of mitigation, de-agentivisation, and controlled generalisation in 45% of episodes is consistent with pragmatic recalibration functioning as a regulatory resource, although this indicator is the one least directly illustrated by the transcribed material and warrants targeted replication. Discourse-level control therefore belongs in cognitive accounts of interpreting, especially for language pairs with strong pragmatic and syntactic mismatches.

The pedagogical implications are direct. Interpreter training can benefit from shifting feedback away from undifferentiated accuracy judgements toward regulation-oriented diagnostics, which involve identifying triggers, evaluating intervention choices, and assessing recovery quality. The training evidence reported here suggests that metacognitive instruction strengthens precisely these capacities, leading to clearer output, higher precision, and reduced cognitive strain. Such an approach is compatible with both on-site and technology-mediated interpreting, where external monitoring cues may be degraded and internal regulation becomes more consequential.

7.3. Implications for English–Ukrainian interpreter training

- Feedback should be organised around regulatory decisions ("What was the trigger?", "Which intervention did you choose?", "Did it stabilise output?"), and not only around error lists.
- Training can explicitly target pragmatic-risk handling in English–Ukrainian SI (mitigation, agency management, evidential framing) as a stability mechanism, and not merely as a matter of style.
- Technology-mediated SI amplifies the need for internal regulation and should be treated as a context where trigger-window patterns are especially informative (Salaets & Brône, 2023; Zhu & Aryadoust, 2022).

Future research could extend the episode-based approach to other language pairs, integrate automated timing measures at scale, and explore how regulatory patterns evolve across expertise levels and interpreting modalities. This article has argued that metacognitive regulation in simultaneous interpreting is best understood as event-driven supervisory control. By making regulatory decisions and recovery dynamics analytically visible, the proposed framework offers both a theoretical refinement and a practical tool for research and training in interpreting studies.

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