

MODULE 4

Attunement in Extended Speech: Voice Pedagogy as Epistemic Practice

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PART A – PORTFOLIO

1. Introduction

This portfolio outlines a three-month literature-based review in Second Language Acquisition (SLA) situated within International English Language Testing System (IELTS) teaching practice. It will examine how learners manage and stabilise utterances in extended speaking under uncertainty. In this review, epistemic commitment will refer to the temporary stabilisation of an utterance through selecting between alternatives during discourse production rather than extended discourse-level positioning. Each stabilisation point will be treated as an epistemic cycle, with extended speaking conceptualised as a sequence in which prior structuring conditions subsequent alternatives (see Part B).

In my IELTS classes, learners often produce fluent speech but struggle to compare and develop ideas under time pressure. Fluency-oriented SLA research successfully models performance through variables including speed and pausing (Skehan, 2014; Segalowitz, 2010), while discourse-oriented work clearly shows that timing contributes to interactional organisation and turn management (McCarthy, 2010; Schegloff, 2007). However, these approaches do not account for commitment unfolding across extended responses where multiple alternatives remain active before stabilisation, treating fluency primarily as delivery efficiency rather than structured decision-making (Segalowitz, 2010).

This gap is especially visible in IELTS Speaking Part 3, where candidates are required to develop and justify responses to abstract questions involving comparison and evaluation across alternatives (IELTS, 2023; Galaczi & Taylor, 2018). These responses involve organising multiple perspectives through repeated local stabilisations rather than a single continuous discourse process.

Temporal features such as pausing are typically interpreted as indicators of processing difficulty (Lennon, 1990; Skehan, 2014). While such features structure interactional organisation and turn management (McCarthy, 2010), they are not typically modelled as epistemic processes. These processes involve holding, comparing, and selecting between alternatives during extended discourse (Levelt, 1989; Kormos, 2006).

This review will investigate how commitment timing is organised through attunement realised in prosodic regulation and observable through prosodic organisation in speech (Ladd, 2008). This question is particularly relevant to Voice Pedagogy (VP), where breath management, phrasing, and temporal coordination have long been regarded as fundamental to skilled vocal performance (Miller, 1986; McCoy, 2012; Welch et al., 2019), yet their epistemic role in managing commitment during extended speaking remains underexplored. This review is situated within my professional IELTS teaching context, where speakers select and organise perspectives under conditions of uncertainty.

Research question:

How is commitment timing organised through prosodic regulation, and how might this apply to extended responses in high-uncertainty L2 speaking tasks?

2. Planned Programme of Study**Context and Professional Rationale**

This project will draw primarily on four intersecting scholarly domains:

1. VP traditions emphasising breath control, phrasing, and dynamic shaping (Miller, 1986; McCoy, 2012)
2. SLA research on fluency, prosody, and pronunciation assessment (Skehan, 2014; Ladd, 2008)
3. RR (Vervaeke, 2019) and PP accounts of cognition, perception, and attention (Friston, 2010; Clark, 2016)
4. 4E (embodied, embedded, enactive, and extended) approaches in cognitive science (Varela, Thompson & Rosch, 1991)

Drawing on sustained classroom observation in IELTS teaching practice, this project will address a mismatch between high-uncertainty speaking tasks and prevailing pronunciation pedagogy. These tasks require learners to compare and evaluate responses without a predetermined discourse trajectory. In IELTS Speaking Part 3, candidates develop responses by comparing ideas, giving reasons, and considering alternatives (e.g. causes or predictions). This requires speakers to manage multiple alternatives before stabilising responses.

However, pronunciation pedagogy typically interprets stress, rhythm, pausing, and intonation in relation to intelligibility and fluency (Celce-Murcia et al., 2010; Derwing & Munro, 2015; Levis, 2018), rather than as resources through which speakers manage alternatives and regulate commitment during extended discourse.

The review will build on prior work proposing an epistemic model of linguistic reasoning (Porter, 2026). Rather than adopting this model a priori, it will use a structured integrative literature review to examine, refine, and extend it through cross-domain comparison (Torraco, 2005; Snyder, 2019). This will situate the model within existing research while supporting its development as a framework for analysing speaking.

The review will examine a gap in IELTS pedagogy: learners are typically trained for fluency and coherence but not explicitly for managing commitment across extended responses. Within this study, SLA will provide the problem context and VP a potential training context.

Aims

The review will examine how timing is managed in extended L2 speaking and its implications for pronunciation teaching.

Objectives

To achieve this aim, the review will:

- Conduct an integrative review across SLA, VP, 4E cognitive science, and Relevance Realisation.
- Identify key differences in how timing is described across these domains
- Analyse how timing is treated in SLA research on fluency and pronunciation
- Develop a working model of timing in extended L2 speaking
- Apply these findings to IELTS speaking instruction

These objectives will align with the research question and follow SMART principles (Doran, 1981).

Personal Learning Outcomes

The study will aim to:

- Develop skills in conducting integrative literature reviews
- Strengthen the ability to connect theory with classroom practice
- Develop a clearer understanding of commitment timing in extended speaking.
- Cultivate research-informed insights into IELTS teaching

Methodological Approach

The study adopts an integrative review methodology (Torraco, 2005; Whitemore & Knafl, 2005; Snyder, 2019) to support conceptual synthesis across cognitive science, SLA, and VP. This approach will enable comparison of how timing is described across domains and support development of a conceptual framework aligned with the research question.

Resources

The study will draw on:

- Google Scholar and the University of Wales Trinity Saint David library for sourcing academic literature
- Prior classroom experience as a contextual reference point
- Previous MA research as a foundation for critical review and refinement
- Module guidance and assessment criteria

Review and Monitoring

Progress will be monitored through:

- Weekly review of literature against objectives and module criteria.
- Ongoing evaluation and revision of conceptual alignment
- Iterative scope refinement
- Final review against module criteria

Activities and Timeline (Three-Month Structure)

Weeks

1–2:	Project design
3–5:	Literature search and conceptual mapping
6–8:	Iterative analysis and framework refinement
9–12:	Consolidation, writing, and alignment with module criteria

Although presented sequentially, these stages will operate iteratively through ongoing revision, targeted literature searches, and classroom-informed refinement, reflecting the recursive nature of integrative review methodology (Torraco, 2005; Snyder, 2019).

3. Methodology

This section outlines the methodological approach for investigating how timing is conceptualised across cognitive science, SLA, and VP, including review design, search strategy, inclusion and exclusion criteria, and limitations.

Review Design

This review will adopt a three-month integrative review examining how timing is conceptualised across cognitive science, SLA, and VP and how this informs teaching practice. It will compare key constructs across fields rather than relying on empirical testing or data aggregation (Torraco, 2005; Snyder, 2019; Popay et al., 2006).

A systematic review (Grant & Booth, 2009; Page et al., 2021) will not be adopted because the study synthesises concepts rather than empirical evidence. A scoping review (Arksey & O'Malley, 2005) is similarly unsuitable because the aim is theory development rather than literature mapping. An integrative review (Torraco, 2005; Snyder, 2019), drawing where appropriate on interpretive synthesis (Popay et al., 2006), will therefore be adopted.

Literature Search Strategy

Google Scholar will be used as the primary database because it indexes literature across the disciplinary domains included in the review. Rigour will be supported through structured Boolean searches.

Search strings are organised across four conceptual domains—Relevance Realisation and Predictive Processing; SLA and L2 speaking; Voice Pedagogy; and 4E cognition:

Within-domain searches (core constructs):

- “Relevance Realisation” AND (uncertainty OR salience OR recursive)
- “predictive processing” AND (commitment OR speech OR timing)
- (“L2 speaking” OR “second language speaking”) AND (fluency OR coherence OR “speech production”)
- “fluency” AND (pausing OR timing OR “speech rate”) AND “second language”
- “prosody” AND (“L2 speaking” OR “second language fluency”)

- “voice pedagogy” AND (breath control OR phrasing OR resonance)
- (“enactive cognition” OR “4E cognition”) AND (language OR interaction)

Cross-domain searches (conceptual integration):

- “prosody” AND (“epistemic stance” OR “discourse organisation”)
- “fluency” AND (pausing OR timing OR “speech rate”) AND “L2 speaking”
- “voice” AND (timing OR phrasing) AND (speech OR communication)
- “predictive processing” AND (language OR action)
- (“enactive cognition” OR “4E cognition”) AND (language OR interaction)

Process-oriented searches (mechanisms of timing and regulation):

- (timing OR pausing OR rhythm) AND (speech OR discourse) AND (cognition OR processing)
- (intonation OR stress OR “pitch contour”) AND (meaning OR stance OR interaction)
- (breath OR phrasing) AND (timing OR control OR coordination)
- (uncertainty OR ambiguity) AND (decision-making OR selection OR evaluation) AND (language OR speech)

- No publication date restriction. Selection is based on conceptual relevance rather than recency (Torraco, 2005; Snyder, 2019), with contemporary scholarship prioritised where appropriate and foundational works retained where conceptually necessary (e.g. Levelt, 1989; Varela, Thompson & Rosch, 1991).

- Prioritisation of peer-reviewed journal articles and academic monographs to ensure credibility and theoretical reliability.

- Citation chaining to identify foundational texts.

- Author-based searches for key contributors.

Inclusion Criteria

Literature will be selected according to conceptual relevance to extended L2 speaking, particularly where it informs timing, prosody, cognition, and behavioural organisation (Snyder, 2019).

Exclusion Criteria

Non-academic sources and studies not directly relevant to extended discourse organisation will be excluded. No publication date restriction will be applied because inclusion is based on conceptual relevance rather than recency. Research focused exclusively on segmental phonetics or unrelated clinical contexts will also be excluded.

Balance and Limitations

Google Scholar may limit discipline-specific indexing but will be supplemented by author-based searches. No empirical data will be collected because of timeframe constraints and the study's theoretical focus; the framework will therefore be presented as an interpretive model suitable for future empirical investigation.

Justification of Conceptual Synthesis

Given the project's cross-disciplinary focus, an integrative review is appropriate because it supports theory-building through conceptual comparison (Torraco, 2005). Aggregation-based approaches (Grant & Booth, 2009) are less suited because the study compares conceptual structures rather than empirical findings. Concepts will therefore be compared according to how timing is described and the level at which it operates (acoustic, prosodic, epistemic).

PART B - PROJECT REPORT

1. Introduction

L2 speaking is not limited to lexical retrieval or grammatical control but involves the construction, evaluation, stabilisation, and revision of meaning in real time (Levett, 1989; Clark, 2016; Linell, 2009; McCarthy, 2010). In high-stakes contexts such as IELTS Speaking Part 3, candidates compare perspectives and extend responses through evaluation and qualification (IELTS, 2023; Galaczi & Taylor, 2018). These tasks require speakers to regulate when provisional ideas are stabilised while maintaining alternative perspectives sufficiently long for comparison and evaluation.

Previous work from the reviewer's Master's research modelled linguistic reasoning as an epistemic process in which ideas are not retrieved fully formed but are organised prior to temporary stabilisation (Porter, 2026). Methodologically, the study analysed participants' written responses as observable traces of the unfolding epistemic process, treating linguistic choices as evidence of how competing candidate meanings were evaluated and provisionally resolved during language production. In this review, *commitment* refers to the local stabilisation event at which one candidate trajectory is provisionally selected within an epistemic cycle. This differs from discourse stance, which refers to broader rhetorical positioning emerging across multiple cycles in extended discourse. Drawing on an integrative synthesis of the literature, this review retains this distinction, modelling commitment timing at the micro-epistemic level while treating discourse stance as a macro-level descriptive construct.

Existing SLA accounts (Skehan, 2014; Segalowitz, 2010) typically treat temporal organisation as an outcome of processing efficiency or fluency rather than a regulatory mechanism. Likewise, phonological accounts (Ladd, 2008; Gussenhoven, 2004) describe the structural organisation of pitch, timing, and prominence, but do not explain how commitment is regulated across competing alternatives in extended discourse. While these frameworks describe temporal patterning in speech, they do not specify how commitment is regulated when multiple alternatives remain active under uncertainty.

Synthesising the reviewed literature, the present review develops a phase-sensitive explanatory framework in which attunement regulates commitment timing, prosodic organisation provides its observable behavioural structure, and pronunciation is reconceptualised as its acoustic realisation.

Within this review, pronunciation refers to the acoustic realisation of prosodic organisation arising from commitment regulation (see Section 2.4). The multi-level architecture of this framework is summarised in Appendix A. By contrast, existing research typically treats pronunciation as segmental accuracy or intelligibility (Derwing & Munro, 2015), or treats prosody structurally within phonological accounts (Ladd, 2008; Gussenhoven, 2004), leaving the regulatory role of prosody in commitment timing under-specified.

IELTS assesses pronunciation alongside fluency and coherence, lexical resource, and grammatical range and accuracy (IELTS, 2023), while classroom preparation often treats it as a discrete component prioritising smooth delivery and segmental accuracy (Derwing & Munro,

2015). Similarly, fluency-oriented approaches model performance in terms of processing constraints (Skehan, 2014), while phonological accounts treat prosody primarily as structural organisation (Ladd, 2008; Gussenhoven, 2004).

Here, "uncertainty" refers to multiple viable utterance trajectories prior to commitment, requiring speakers to evaluate alternatives before stabilisation (Friston, 2010; Clark, 2016).

Temporal variables such as speech rate and pausing are typically treated as indicators of processing ease rather than regulatory timing (Tavakoli & Skehan, 2005; De Jong, 2016). Although discourse-oriented accounts recognise that pausing structures interaction (McCarthy, 2010), this review reframes prosodic timing as a regulatory mechanism in extended discourse.

Timing is central: premature commitment limits exploration, excessive delay prevents stabilisation, and flattened prosody reduces weighting.

The present account develops a phase-sensitive framework for modelling commitment timing, extending a previously established epistemic process (Porter, 2026). The paper is theoretical and pedagogical in focus.

2. Literature Review and Conceptual Integration

This section compares how epistemic commitment is treated across 4E cognitive science, RR, SLA, and VP to establish commitment timing as a regulatory process. Through this synthesis, it develops Relational Density (RD) (Porter, 2026) as a conceptual account of how multiple alternatives are preserved and organised across epistemic commitment phases.

Extending accounts of processing efficiency (Skehan, 2014) and discourse organisation (McCarthy, 2010), the framework developed through this review integrates RD with RR (Vervaeke et al., 2012) to explain how alternatives are structured, maintained, and selected across commitment transitions.

From this synthesis, attunement can be specified as the regulatory process governing commitment transitions across epistemic phases and shaping the temporal distribution of RD. Its observable manifestation is prosodic modulation, whose structural organisation has been extensively described in phonological accounts (Ladd, 2008; Gussenhoven, 2004).

While prior work established RD as a behavioural indicator of differentiated structuring linked to observable linguistic and prosodic patterns (Porter, 2026), it could not specify how this structuring is sustained, weighted, stabilised, or reopened. SLA and VP are treated as partial instantiations of this process: SLA captures its observable outcomes in performance metrics, while VP trains the temporal conditions under which it operates.

2.1 Relevance Realisation (RR)

RR conceptualises cognition as dynamic salience modulation rather than the retrieval of pre-formed representations (Vervaeke et al., 2012). PP accounts similarly model cognition through precision-weighted prediction error (Friston, 2010; Clark, 2016). However, because these accounts model cognition rather than analyse extended discourse, they do not specify how differentiated alternatives are preserved and stabilised across recursive commitment cycles.

This process is modelled as a recursive phase sequence comprising Open, Bias, Commit, and Reopen (Porter, 2026), synthesising action selection (Cisek and Kalaska, 2010), Predictive Processing (Friston, 2010), and enactive cognition (Varela, Thompson and Rosch, 1991). The analytic phases are defined as follows:

- Open: alternatives remain active.
- Bias: differential weighting emerges.
- Commit: selective stabilisation occurs.
- Reopen: commitment is destabilised, permitting renewed differentiation.

RR therefore provides the cognitive architecture within which the present synthesis situates Relational Density as a behavioural account of organisation prior to commitment.

2.2 Relational Density (RD)

Within the model developed through this review, RD reconceptualises pre-commitment organisation by accounting for how differentiated alternatives are preserved and weighted across recursive epistemic commitment phases during extended discourse production. Irrelevance Potential (IP), proposed in prior work (Porter, 2026), refers to the persistence of previously differentiated but unselected alternatives that continue to condition subsequent candidate fields across episodes.

Whereas RD indexes alternatives within a local commitment cycle, IP extends the analysis across recursive episodes by specifying their availability following stabilisation.

Within the synthesis-derived framework developed here, retained irrelevance is treated as a structured candidate field through which subsequent salience may be filtered. In this sense, IP provides a possible behavioural specification of how candidate alternatives remain available across recursive epistemic cycles, though this requires further theoretical and empirical investigation.

This organisation is observable through linguistic resources including conditional clauses (Dancygier, 1998; Kratzer, 1991), modalised projections (Palmer, 2001; von Stechow, 2011), concessive and adversative connectives (Fraser, 1999), comparative framing devices, and recursive monitoring constructions (Couper-Kuhlen and Thompson, 2000; Halliday & Matthiessen, 2014).

RD is distinct from structural complexity and from IP, which specifies persistence across subsequent candidate fields. Complexity measures structural elaboration, such as clause density and subordination (Norris & Ortega, 2009; Bulté & Housen, 2012). RD, by contrast, indexes the co-presence of differentiated alternatives prior to stabilisation. A response may be structurally complex yet follow a single trajectory, or simple while sustaining multiple alternatives. RD is therefore analytically independent of structural elaboration.

The linguistic and prosodic markers associated with this structuring are systematised in Appendix B and treated as indexical resources reflecting variation in RD across epistemic phases, indicating expansion, differentiation, stabilisation, and reopening (Biber et al., 1999; Hyland, 2005; Ladd, 2008; Gussenhoven, 2004).

2.3 Attunement and Voice

Existing 4E (embodied, embedded, enactive, extended) accounts primarily theorise organism–environment coupling but do not specify how commitment timing is regulated across recursive epistemic cycles. Consequently, temporal organisation remains implicit within general coupling dynamics (Varela, Thompson & Rosch, 1991; Noë, 2004; Gallagher, 2005; Di Paolo, Buhrmann & Barandiaran, 2017).

Attunement is specified here as the mechanism regulating commitment timing within agent–arena coupling, extending RR-oriented accounts of adaptive coordination under conditions of uncertainty (Vervaeke et al., 2017; Clark, 2016). RD indexes differentiated organisation across commitment transitions (Porter, 2026), with its distribution regulated through attunement. Prosodic organisation provides the primary observable structuring of attunement in speech, with pronunciation treated here as its acoustic realisation. This distinction draws on phonological accounts of prosodic structure and acoustic organisation (Ladd, 2008; Gussenhoven, 2004).

In VP, this regulation corresponds to capacities systematically developed through breath management, phrasing, and dynamic control (Miller, 1986; McCoy, 2012; Bozeman, 2013), shaping delay, weighting, and stabilisation under conditions of uncertainty, while remaining under-specified in epistemic terms. Prosodic modulation—pitch range, contrastive stress, pause placement, and nuclear focus—provides observable correlates of this regulation (Ladd, 2008; Brazil, 1997).

Voice is treated here as the observable organisation through which attunement-based commitment regulation becomes perceptible in speech. This is consistent with Heraclitus' conception of logos as an underlying order emerging through tension (*harmoniē*) (Kahn, 1979), and with contemporary accounts such as PP, in which calibration occurs through continuous prediction updating under uncertainty (Friston, 2010; Clark, 2016).

To clarify the distinction between attunement, prosodic regulation, prosodic organisation, and pronunciation, the levels are outlined in Appendix C.

Prosodic organisation is treated here as the structured temporal pattern through which local commitment dynamics are realised in speech, distinct from macro discourse stance organisation.

Attunement is therefore specified here as the mechanism linking behavioural organisation to its prosodic realisation.

2.4 Prosodic Organisation and Acoustic Realisation

Within the proposed framework, prosodic organisation is specified as a pattern of timing, prominence, and contour (Ladd, 2008; Gussenhoven, 2004), providing the observable basis for analysing commitment timing in speech. This synthesis yields three analytically separable levels: acoustic (pitch, timing, intensity), prosodic (grouping, prominence, contour), and epistemic (local commitment, uncertainty, alternative weighting).

Within this framework, prosodic organisation therefore provides the primary observable evidence of attunement in speech. However, phonological analyses typically operationalise prosody as structural organisation rather than as evidence of epistemic regulation (Cutler, Dahan & van Donselaar, 1997; Ladd, 2008; Gussenhoven, 2004; cf. Brazil, 1997).

Earlier prominence highlights alternatives, whereas final focal stress marks stabilisation. In phonological terms, this corresponds to pre-nuclear prominence and nuclear stress (Ladd, 2008; Cruttenden, 2014), providing a basis for aligning prosodic form with local epistemic function. Appendix A summarises the multi-level architecture underlying the framework, while Appendix D specifies how attunement operates across epistemic commitment phases and is realised through prosodic organisation and acoustic realisation.

To illustrate how this architecture manifests behaviourally, Appendix L presents phase distributions across task conditions varying in ambiguity based on prior LTA analysis (Porter, 2026). LTA identifies epistemic phases (Open, Bias, Commit, Reopen) through observable linguistic and prosodic traces from which RD is inferred, with higher task ambiguity associated with extended Open–Bias intervals and delayed stabilisation.

The following example response illustrates the proposed epistemic phase structure:

“Public transport can be unreliable / especially during rush hour / but it’s generally cheaper than driving / and in some cities it’s actually faster / so overall I’d still prefer it”

The segmented units correspond to tone units organised around a single nucleus (Halliday, 1967; Brazil, 1997; Ford & Thompson, 1996). They are interpreted as prosodic units across which local commitment dynamics unfold, not as epistemic phases.

The initial clause maintains an Open phase, while the contrastive shift (“but”) introduces a competing trajectory. The subsequent extension (“and in some cities it’s actually faster”) sustains the Bias phase through continued differentiation and weighting of alternatives. The final clause (“so overall I’d still prefer it”) is realised through nuclear stress, falling contour, and boundary marking, signalling local stabilisation (Commit). Earlier units distribute prominence to support the maintenance and weighting of alternatives.

The pause before the contrastive shift functions as calibrated delay, enabling relational differentiation rather than signalling breakdown. Established tone-unit accounts describe prosodic structure but do not explicitly model commitment timing across differentiated alternatives, leaving this role under-specified within SLA.

2.5 A Possible Objection: RD and Discourse Complexity

A potential objection is whether RD is analytically distinct from existing accounts of discourse complexity.

Indeed, RD may redescribe syntactic complexity and stance marking, which quantify structural elaboration and evaluative positioning (Biber et al., 1999; Hyland, 2005; Martin & White, 2005; Norris & Ortega, 2009) making RD appear reducible to structural output or attitudinal marking; this is evaluated further in Section 3.3.

However, RD operates at a different analytic level: it indexes how differentiated alternatives are established and sustained across epistemic commitment phases rather than how much structure is produced (Porter, 2026). A response may be syntactically complex yet collapse onto a single trajectory, while a structurally simple utterance may sustain multiple alternatives for comparison (McCarthy, 2010; Hutto & Myin, 2013; Skehan, 2014) and reopening.

This distinction can be illustrated through a minimal contrast:

(a) “Public transport is useful because it reduces traffic, so I prefer it.”

(b) “Public transport reduces traffic, but it can be unreliable, so I’m not sure.”

Both responses exhibit comparable clause structure and evaluative content. However, (a) moves rapidly to stabilisation (Commit-dominant), while (b) sustains differentiated alternatives prior to closure (extended Open–Bias interval). This variation reflects differences in epistemic commitment phase distribution rather than syntactic complexity or stance marking alone.

3. Methodological Critique

Building on this distinction, this section evaluates how SLA and VP treat commitment timing, reducing it to processing efficiency or enacting it without explicit theoretical specification.

Commitment timing is analysed through observable linguistic and prosodic traces, shifting the analytic focus from performance outcomes to regulatory organisation. In prior work, Linguistic Trace Analysis (LTA) (Porter, 2026) operationalised Open, Bias, Commit, and Reopen through lexical and syntactic behavioural indices. The present review aligns these with prosodic realisation in speech (Ladd, 2008; Gussenhoven, 2004).

The present review aligns these traces with established lexical and prosodic markers—such as modality, conditional structuring, contrastive stress, and intonational contour—treating them as surface indices of relational structuring rather than direct indicators of cognition.

Together, these revisions constitute a methodological shift in which temporal features are treated as structured traces of regulatory processes, allowing competing accounts based on processing efficiency or structural complexity to be evaluated against epistemically phase-structured organisation.

3.1 SLA Pronunciation Methodology

In SLA, fluency-oriented research operationalises temporal variables as indicators of processing efficiency. Within the complexity–accuracy–fluency framework, fluency is measured through speech rate, mean length of run, pausing, and repair (Skehan, 2009; Skehan, 2014; Tavakoli & Skehan, 2005), with pausing treated as a by-product of processing constraints (Levelt, 1989). Norman Segalowitz (2010) similarly defines fluency in terms of smoothness and delivery rate.

Pronunciation research within the intelligibility paradigm adopts listener-based measures of comprehensibility (Munro and Derwing, 1995; Derwing & Munro, 2005), while temporal features remain evaluated in terms of processing ease. IELTS descriptors refer to “language-related hesitation” (IELTS, 2023), defining fluency as sustained delivery with minimal disruption, without

distinguishing calibrated delay as regulatory competence. This makes calibrated delay difficult to distinguish from breakdown within assessment criteria, reinforcing a bias toward rapid stabilisation.

Practitioner observation in IELTS contexts suggests this bias extends to classroom practice, where learners are often surprised that calibrated delay (e.g. brief hesitation markers or paraphrasing) is acceptable, implying that pre-commitment delay is implicitly discouraged.

This emphasis aligns with critiques that assessment privileges measurable outcomes over process (Black and Wiliam, 1998; Shepard, 2000) and performance efficiency (Segalowitz, 2010; Skehan, 2014), encouraging performance-oriented approaches (Dweck, 2000; Messick, 1989).

While pausing is typically treated as breakdown within SLA accounts (Lennon, 1990; Skehan, 2014), discourse and phonological approaches describe temporal organisation in terms of prominence, contour, and interactional structuring (Ladd, 2008; Cruttenden, 2014; McCarthy, 2010). Interactional accounts relate timing to turn organisation and stance marking (Schegloff, 2007) but do not explicitly model commitment regulation across extended discourse (Halliday & Matthiessen, 2014).

The principal reductions identified in SLA pronunciation research, together with their reinterpretation in the present model, are summarised in Table 1:

Table 1. Common Reductions of Pronunciation in SLA Frameworks

Reductions	Reinterpretation in Present Framework
Pronunciation as accuracy of segmental sounds (e.g. Derwing & Munro, 2005; Celce-Murcia et al., 2010)	Acoustic realisation of prosodic organisation
Pronunciation as a surface feature of language (e.g. Jenkins, 2000; Levis, 2005)	Acoustic interface of underlying organisation
Pronunciation as performance output (e.g. Skehan, 1998; Segalowitz, 2010)	Observable trace of regulatory processes

SLA research models the outcomes of temporal organisation (e.g. Skehan, 2014; Segalowitz, 2010), while discourse-oriented approaches address temporal structuring (e.g. McCarthy, 2010; Carter, 2004) though neither explicitly specify the regulatory processes generating them.

3.2 Voice Pedagogy Methodology

VP is not a unified field but comprises competing epistemological orientations. Physiologically grounded models prioritise efficiency and acoustic optimisation (Titze, 2000; McCoy, 2012), while experiential and lineage-based traditions treat vocal knowledge as embodied and transmitted through practice (Sansom, 2019; Eidsheim, 2015). These orientations differ not only

in method but in what counts as explanation: scientific approaches model timing as a by-product of coordinated physiological processes, whereas experiential traditions operationalise timing through phrasing, breath, and stylistic shaping without formal specification (Miller, 1986; Bozeman, 2013; Welch et al., 2019).

This reflects a methodological tension between partially overlapping explanatory approaches. Scientific models provide explicit accounts of underlying mechanisms, but this explanatory strength is offset by a tendency to reduce temporal organisation to physiological efficiency (Titze, 2000; McCoy, 2012). Conversely, experiential traditions provide systematic training in temporal control while leaving its underlying regulatory function theoretically unspecified (Miller, 1986; Bozeman, 2013).

The present framework adopts a selective explanatory stance by treating VP practices as systematic enactments of temporal regulation while reframing their function in explicit epistemic terms. Accordingly, physiological models explain how temporal organisation is produced, experiential VP explains how it is trained in practice, and the present framework explains why it is organised in this way: as the regulation of commitment across alternatives.

In practice, this regulation is realised through breath management, phrasing, dynamic contrast, and resonance, sustaining structure, delaying closure, shaping contrast, and coordinating release (Miller, 1986; Bozeman, 2013; McCoy, 2012). Premature closure disrupts structural coherence, while insufficient differentiation flattens contrast. Calibrated timing is therefore foundational to maintaining alternatives prior to stabilisation.

The review rejects direct transfer from singing to L2 performance and instead identifies a structural isomorphism between the two domains: both require temporal regulation prior to stabilisation, differentiated weighting, calibrated closure, and re-entry.

This regulation can be operationalised within IELTS Speaking Part 3 tasks through pedagogical stages approximating epistemically phase-structured commitment, drawing on discourse-oriented SLA, fluency research, and prosodic phonology (Halliday, 1967; Brazil, 1997; Skehan, 2014; Segalowitz, 2010; McCarthy, 2010).

Appendix E provides a classroom instantiation of the pedagogically structured framework outlined in Appendix D. It demonstrates how attunement-based regulation is realised pedagogically in high-uncertainty speaking contexts.

3.3 Conceptual and Methodological Limitations

As a theoretical and integrative framework, this account does not provide empirical validation but specifies an analytic architecture for organising observable behavioural patterns across domains and supporting empirical testing. Rigour is pursued through conceptual clarity, cross-domain coherence, and explicit discriminant conditions distinguishing its constructs from adjacent accounts. The present approach does not advance mechanistic causal claims regarding prosody and cognition; rather, it formalises marker alignments as an analytic procedure for identifying phase-sensitive variation in commitment timing within observable behaviour.

A central objection is that the framework captures task-induced extended discourse structuring (Seedhouse, 2004; McCarthy, 2010), rather than a distinct epistemic mechanism. On this account, pausing, prominence, and structural elaboration co-vary with discourse complexity and interactional organisation.

This yields the following discriminant condition: epistemic commitment phase distribution constitutes a distinct analytic dimension only where it is not accounted for by established measures of structural complexity, stance marking, or interactional timing. This can be determined by comparing epistemic phase distribution with these measures under matched task conditions.

If Open–Bias phase expansion is fully accounted for by these factors, RD collapses into existing measures and does not constitute an independent analytic dimension. For example, formulaic contrastive frames ('on the one hand... on the other hand...') and enumerative sequences ('firstly... secondly...') may generate apparent alternative structuring without sustaining competing trajectories, thereby mimicking Open–Bias expansion without constituting authentic RD. Extended illustrative examples demonstrating the distinction between RD and structurally generated alternatives are provided in Appendix J.

To evaluate this condition, two task- and length-matched responses may be compared by (i) calculating structural complexity (e.g. clause density and subordination), (ii) identifying stance marking (e.g. evaluative lexis), (iii) analysing temporal features (e.g. pause frequency and placement relative to clause boundaries and contrastive transition points), and (iv) analysing epistemic phase distribution through LTA.

Where responses show comparable structural and temporal profiles but differ in the duration and distribution of Open–Bias phases, this supports RD as an independent analytic dimension. Where phase distribution aligns with these measures, it does not.

The proposed discriminant approach is heuristic and risks overgeneralisation if treated deterministically: structural alignment does not imply domain identity, and classroom constraints may limit implementation (Appendix F).

Research on stress and trauma suggests perceived threat can accelerate stabilisation and reduce tolerance for uncertainty (Van der Kolk, 2014). Its relevance is architectural rather than clinical: compressed pre-commitment intervals may constrain reopening and limit relational differentiation without implying equivalence between trauma and L2 performance.

The marker alignment in Appendix B—linking prosodic, lexical, and syntactic markers to Open, Bias, Commit, and Reopen phases—is presented as an interpretive framework rather than an acoustic measurement model (Ladd, 2008; Gussenhoven, 2004). RD is not directly observable and is therefore inferred from structured linguistic and prosodic traces; however, interpretation is constrained by the specification of epistemic phase structure, trace markers, and discriminant conditions under which alternative explanations, such as structural complexity or processing difficulty, would account for the same data.

Accordingly, the distinctiveness of RD and attunement depends on empirical discriminability rather than conceptual definition alone. The framework therefore operates as a falsifiable analytic model whose validity depends on generating empirically distinguishable predictions under the specified discriminant conditions.

A further limitation concerns interpreting prosodic features as indicators of epistemic structuring. Prosodic variation may arise from stylistic preference, discourse conventions, or performative competence rather than from underlying commitment dynamics (e.g., Ladd, 2008; Cutler, 2015). In such cases, similar acoustic patterns may correspond to different epistemic configurations, weakening prosody as an index of RD and attunement. Prosodic–epistemic alignment should therefore be treated as probabilistic, requiring triangulation with structural and temporal evidence.

A further limitation concerns IP, proposed as the persistence of previously differentiated alternatives across episodes, thereby constraining subsequent candidate fields (Porter, 2026). While compatible with the present framework, its operation remains theoretically specified rather than empirically demonstrated. Future research is therefore required to determine whether cross-episode persistence can be distinguished from existing accounts of discourse organisation and memory.

Future investigation must establish whether RD, attunement, prosodic organisation, and finer-grained tone-unit analysis can be operationalised to differentiate them from existing measures across varied discourse contexts.

3.4 Methodological Shift Proposed

In response to these limitations, the synthesis developed in this review redefines what counts as analytically relevant. Rather than introducing new data collection procedures, the framework models linguistic and prosodic patterns as behavioural traces of commitment timing through Linguistic Trace Analysis (LTA). These traces are treated as indirect indicators of structured processes inferred from observable effects (Marr, 1982; Borsboom, 2005), without relying on subjective report or performance indicators.

Conventional distinctions between practice-based, practice-led, qualitative, and quantitative research are typically framed in terms of how knowledge is generated and validated (Nelson, 2013; Candy & Edmonds, 2018; Winter, 2023; Creswell & Creswell, 2018; Denzin & Lincoln, 2018).

By contrast, this framework formalises practice as behavioural structure, with qualitative and quantitative approaches differing only in how this structure is rendered observable. Table 2 summarises this framework:

Table 2. Reframing Practice-Based and Practice-Led Research as a Unified Process

Approach	Process	Benefit
Practice-based (Nelson, 2013)	Experience / output	Contextual relevance but often relies on subjective or descriptive accounts
Practice-led (Candy & Edmonds, 2018)	Theory about practice	Conceptual clarity but may be detached from real-time behavioural processes
Integrated approach (this study)	Behaviour → analysis → theory	Combines relevance and rigour by analysing observable behaviour without relying on subjective data

Applied to discourse analysis, existing models describe structural elaboration and evaluative stance (Norris & Ortega, 2009; Hyland, 2005) but do not specify how alternatives are preserved and reorganised prior to commitment. RD accounts for this organisation across epistemic phases. The framework nevertheless prioritises temporal regulation and may under-represent lexical, grammatical, and interactional factors in L2 performance.

4. Pedagogical Implications

Having identified how commitment timing is under-specified in SLA and under-theorised in VP, this section examines how attunement-based regulation can be applied pedagogically.

4.1 L2 Speaking Under Uncertainty

Professional engagement with IELTS assessment is consistent with the assessment criteria, which reward flexibility, responsiveness, and the development of ideas over memorised responses (IELTS, 2023; Galaczi & Taylor, 2018). Band descriptors prioritise coherent development and interaction, particularly through Fluency and Coherence and Lexical Resource, which emphasise flexible and appropriate language use. At the same time, high-stakes testing exerts washback on classroom practice, encouraging performance-oriented strategies such as memorisation (Cheng, 2005; Green, 2007; Shohamy, 2001).

The present pedagogical context is private IELTS preparation in Vietnam, where learners are shaped by high-stakes examination demands. These orientations can be linked to exam-oriented secondary education, which prioritises accuracy and correctness (Carless, 2007; Cheng, 2005), establishing norms that favour predictability over sustained exploration under uncertainty. This reflects assessment as an organising force shaping expectations about appropriate performance, rather than rote learning alone (Biggs, 1996; Watkins & Biggs, 2001).

However, this orientation contrasts with IELTS Speaking Part 3, which requires comparison, justification, and extended response beyond formulaic patterns (IELTS, 2023; Galaczi & Taylor, 2018). Such tasks create conditions of uncertainty in which multiple alternatives remain viable prior to commitment, creating a pedagogical mismatch. Exam-oriented training may compress

this interval, limiting the capacity to sustain, weight, and reorganise alternatives before stabilisation.

In performance, this may manifest as premature closure, over-hesitation, flattened prosody, and limited relational weighting. From an RD perspective, reduced early epistemic structuring limits the range of alternatives available for reopening and subsequent structuring (Porter, 2026), while absence of contrastive stress, pitch differentiation, or structured pause may limit weighting (Ladd, 2008). Where such structuring is not explicitly modelled, fluency is interpreted primarily as efficiency rather than differentiated organisation (Messick, 1989).

In practice, learners trained to tolerate pre-commitment delay and differentiate alternatives prior to stabilisation are better able to sustain extended responses. This supports Fluency and Coherence through sustained development and flexible organisation of ideas, while prosodic modulation supports Pronunciation by making relational weighting and stabilisation perceptible. Attunement-based regulation may therefore support performance by regulating commitment timing rather than fluency alone, though it may require careful scaffolding in high-pressure contexts.

4.2 Singing as Commitment-Timing Training

This review does not claim direct transfer from musical skill to L2 cognition, but positions VP as a domain in which embodied temporal regulation is systematically trained through established vocal practices (Miller, 1986; McCoy, 2012), interpreted here as supporting delay, weighting, stabilisation, and re-entry.

Singing pedagogy trains sustained phrasing prior to cadence, delaying stabilisation while relational shaping continues. Breath regulates timing, phrase arcs organise differentiation, cadence marks stabilisation, and re-entry initiates renewed expansion. Although not formulated in epistemic terms, these practices regulate temporally extended processes delaying closure until phrase completion.

Drawing on established accounts of singing pedagogy, these practices can be recast in commitment-timing terms as follows:

- Breath control (Miller, 1986; McCoy, 2012) as delay tolerance
- Dynamic shaping (Miller, 1986) as relational weighting
- Pre-cadential shaping as stabilisation
- Cadence (McCoy, 2012) as commitment (closure)
- Phrase re-entry (Miller, 1986) as reopening

These practices align with VP traditions treating breath, phrasing, and temporal shaping as primary organisational principles while extending them into epistemic regulation in speech.

In classroom implementation, the framework was operationalised through a two-stage progression. Initial tasks required explicit contrastive structuring ('on the one hand... on the other hand...'), with learners maintaining alternatives prior to closure. Reduced scaffolding then encouraged more flexible responses characterised by calibrated pausing, increased pitch differentiation, and delayed nuclear stress placement, with feedback focused on timing of

closure and maintenance of contrast, indicating a shift toward internally regulated commitment timing.

A corresponding baseline progression using low-uncertainty IELTS Part 1 tasks—illustrating linear Answer–Reason–Extend structuring prior to the introduction of reopening—is provided in Appendix G. An extended pedagogical progression demonstrating how justification is developed through functional differentiation and attunement is provided in Appendix H.

Practitioner observation suggested variable uptake: some learners developed calibrated pausing, differentiated contour, and delayed stabilisation, whereas others retained overt structuring.

While differentiation can be externally scaffolded, commitment timing appears to depend on internalised phase-sensitive control, suggesting a shift from explicit structuring towards commitment timing.

4.3 Structural Alignment Between Singing and Epistemic Commitment

Building on internally regulated commitment timing, epistemic regulation involves expansion, weighting, stabilisation, and reopening across epistemic phases. Prosodic research shows that falling contours index closure, contrastive stress marks relational weighting, and pitch reset signals reorientation (Ladd, 2008; Brazil, 1997; Gussenhoven, 2004), providing an observable basis for analysing attunement in speech.

VP is therefore understood as a domain in which commitment-timing regulation is systematically enacted through structured temporal coordination.

English prosody relies on contrast across stress, rhythm, and intonation (Ladd, 2008; Cruttenden, 2014). Reduced stress contrast reflects differences between syllable-timed and stress-timed systems: Vietnamese lacks systematic vowel reduction, whereas English depends on stress contrast and reduction to organise rhythm (Nguyen & Edmondson, 1998; Nguyen & Ingram, 2005). When reduction is limited, prominence contrast is reduced, making relational weighting and stabilisation less perceptible (Field, 2005).

Within intonational phonology, pre-nuclear prominence and nuclear stress are interpreted here as indexing relational weighting and commitment respectively, with commitment typically realised through terminal falling contours (Ladd, 2008; Brazil, 1997; Cruttenden, 2014). Rhythmic alternation and vowel reduction sustain this contrast, while reduced final consonants may weaken boundary signalling, limiting the perceptibility of phase transitions (Nguyen & Edmondson, 1998; Cruttenden, 2014).

In this pedagogical approach, learners annotate scripts for stress, reduction, linking, pausing, and pitch before practising integrated production. In forms such as *pick_it up* or *back_out*, clear final consonants support smooth linking (Celce-Murcia et al., 2010). Rhythm is taught through stress anchors and compressed unstressed material (Cruttenden, 2014), corresponding in VP to coordinated timing, prominence, articulation, and breath support (Miller, 1986; McCoy, 2012; Moss Erickson, 2022).

Cadential slowing and terminal fall mark commitment (closure), while pitch reset supports reopening (Brazil, 1997; Ladd, 2008). An illustrative classroom sequence demonstrating perspective differentiation and prosodic contrast management in IELTS Speaking Part 3 is provided in Appendix I. The pedagogical aim is the restoration of contrastive structure sufficient to signal these transitions.

4.4 Reframing Pronunciation Pedagogy as Commitment-Timing Regulation

Instruction is implemented through annotated scripts and staged practice. Learners mark stress, pause, and focal placement, with evaluation based on contrast clarity and pause timing (Field, 2005; Segalowitz, 2010). These features are presently interpreted in relation to the alignment between stress and stabilisation. Prosodic contrast supports perceptible movement in extended discourse: when contrast is compressed or closure occurs prematurely, relational differentiation may be less perceptible and reopening constrained (Porter, 2026).

Pronunciation pedagogy is typically framed as surface correction of stress and intonation patterns within form-focused instruction (Celce-Murcia et al., 2010; Derwing & Munro, 2015), without accounting for the regulation of commitment timing in extended discourse. The present approach repositions pronunciation as the training of its acoustic realisation within extended discourse.

Illustrative Procedure: Structured Pause to Delay Commitment

Controlled pausing delays commitment and allow relational structuring prior to stabilisation. Learners insert brief, intentional pauses before evaluative or contrastive transition points (e.g. "...it's convenient / [pause] but it can be unreliable"), distinguishing these from hesitation or breakdown.

Further pedagogical procedures, including pitch reset, contrastive stress, and delayed contour deployment, are detailed in Appendix K.

This shifts attention toward perception, as learners identify how commitment is delayed, weighted, and stabilised through prosodic and embodied cues, supporting performance in tasks such as IELTS Speaking Part 3 by enabling delayed closure, sustained comparison, and more coherent responses under conditions of uncertainty (IELTS, 2023). The pedagogical aim is the preservation of differentiated structuring prior to stabilisation (Porter, 2026), with pronunciation treated as the training of commitment timing in extended discourse.

4.5 VP as Epistemic Training

Building on the preceding framework, this section considers VP as a domain in which attunement is systematically trained in practice, though not explicitly theorised and often described in therapeutic or expressive terms.

If RD concerns preserving differentiated structuring across commitment transitions in extended discourse (Porter, 2026), pedagogical design sustains comparison before closure, requires reintroduction of previously stabilised selections, and increases uncertainty while maintaining differentiation.

Within this view, SLA pronunciation pedagogy captures the acoustic outcomes of regulation, whereas VP systematically trains commitment timing prior to stabilisation.

5. Conclusion

This review synthesised scholarship across SLA, cognitive science, and VP to develop a phase-sensitive framework for modelling commitment timing in extended L2 speaking under uncertainty. It integrates RD, attunement, prosody, and VP within a unified account, modelling attunement as the phase-sensitive mechanism regulating commitment across differentiated alternatives through the integration of RR and RD (Porter, 2026).

Prosodic organisation is reconceptualised as the multimodal temporal structuring of this process across epistemic cycles, with variation in pitch, prominence, and timing providing observable indicators of commitment dynamics (Ladd, 2008; Brazil, 1997). Pronunciation functions as its acoustic interface.

The present framework bridges these domains by treating VP as a domain in which epistemic regulation is systematically trained and potentially applied to L2 speaking through prosodic organisation.

This reconceptualisation positions pronunciation pedagogy as training in calibrated delay, differentiated weighting, and controlled stabilisation. In high-uncertainty tasks such as IELTS Speaking Part 3, this supports coherence, flexibility, and extended response development.

The framework generates testable predictions. High-uncertainty speaking tasks are expected to exhibit extended Open–Bias intervals, greater contrastive weighting, and delayed stabilisation, whereas low-uncertainty tasks should remain Commitment-dominant. Reopening is conceptualised as a return to previously differentiated alternatives and may be accompanied by pitch-reset phenomena (Brazil, 1997; Ladd, 2008). Greater control of prosodic timing may permit earlier differentiation without corresponding increases in structural complexity (Norris & Ortega, 2009), providing a basis for future empirical investigation across SLA, phonology, and cognitive science.

The integration of RD and Irrelevance Potential offers a behavioural specification of candidate maintenance within RR by proposing that previously differentiated but unselected alternatives remain organised as a structured candidate field through which subsequent salience is filtered. This generates questions for future investigation into candidate maintenance within RR prior to commitment.

More broadly, the framework argues that pronunciation has been undervalued because its role in rendering commitment observable has not been specified. By modelling commitment timing as an organising dimension of discourse, it reconceptualises pronunciation as the observable realisation of epistemic regulation in extended L2 speaking rather than a peripheral aspect of speech production.

PART C - CRITICAL REFLECTION

This section provides a critical reflection on the study's development, drawing on reflective practice frameworks (e.g. Schön, 1983; Allan, 2011). The reflection follows the DEBRIEF model (Allan, 2011), applied where conceptual or methodological elements did not align, prompting revision. Early stages focused on identifying observable features of classroom practice, such as pausing, contrastive structuring, and response development. Through iterative reflection, the analysis shifted from describing these behaviours to examining how they reflected underlying temporal organisation through differentiation, weighting, stabilisation, and reopening. This interpretation is based on observable behavioural structure instead of subjective report.

Practitioner research is often framed as balancing methodological rigour and contextual relevance (Cochran-Smith & Lytle, 2009; Winter, 2023). Through iterative revision, this review moved from abstract conceptual alignment towards observable behavioural structure, reducing theoretical overextension and focusing analysis on phase-sensitive commitment timing.

This shifted my methodological focus towards observable behavioural and organisational patterns across domains. Through this study I came to identify a gap: the absence of an explicit model of epistemic process. This led me to view theory, assessment, and pedagogy as aspects of the same underlying regulatory process, rather than as separate areas of practice.

The study emerged from critical interrogation of established IELTS teaching routines rather than technical deficiency. My practice emphasised pronunciation features such as stress, focal placement, and intonation (Ladd, 2008; Cruttenden, 2014), alongside structured IELTS response frameworks (e.g. Answer–Reason–Extend), which organise responses through linear scaffolds. While effective for clarity, they stabilised epistemic structuring within predictable progression models. I initially assumed this was sufficient, without accounting for how speakers manage competing alternatives prior to commitment or how the attunement-based model relates to this level of organisation (Porter, 2026).

One of the most significant moments in the project was recognising that I had assumed the epistemic model mapped directly onto pedagogical structure. Through DEBRIEF, I separated the epistemic process from pedagogical sequencing by presenting the four-phase model independently and linking prosody to it throughout lessons. This reduced learner confusion while clarifying that the epistemic model operates at the level of commitment as opposed to stance.

This exposed a deeper issue in my thinking: I had been analysing completed responses rather than the process of arriving at them. This led me to initially conflate stance with epistemic commitment, treating stabilised positions as equivalent to the underlying process of commitment.

Through DEBRIEF, this was clarified by separating examiner expectations, which prioritise resolved responses, from the underlying epistemic process, in which learners often stabilise ideas without adopting a stance. This clarified a progression within my own teaching: I had

moved from requiring early commitment, to encouraging the generation of perspectives without immediate stabilisation, and finally toward synthesis and extended discourse stance formation within a field of alternatives. Without an explicit process model, these shifts appeared inconsistent; the present approach instead interprets them as phase-specific differences in commitment timing rather than competing instructional approaches.

Introducing a phase-sensitive model (Open, Bias, Commit, Reopen) separated the organisation of alternatives from their stabilisation, reducing premature closure in my teaching. Prosodic organisation made commitment timing observable, while VP emerged as a relevant training domain because it systematically develops timing, weighting, and closure. This changed how I now think about pedagogical superstructure, leading me to interpret it in regulatory rather than purely structural terms.

While linear superstructures support lower-proficiency learners, they may constrain flexibility at higher levels. I therefore adopted a two-stage approach: initial structural scaffolding followed by attunement-based regulation, while recognising the increased cognitive demands of sustaining alternatives.

Developing the framework also made me more aware of the cognitive and contextual constraints, particularly in exam-oriented and lower-proficiency contexts where sustaining alternatives increases processing load and answer production is prioritised over pre-commitment processes.

While the framework integrates cognitive theory, discourse pragmatics, and phonology, its operationalisation remains interpretive and is difficult to apply consistently in real-time teaching contexts.

These developments have reshaped my understanding of instruction, shifting from modelling correct output to scaffolding response construction through commitment timing, enabling learners to sustain, compare, and modify alternatives prior to stabilisation.

Reflecting on my previous teaching, I realised that functional language activities effectively model routine interactional functions but remain tied to constrained scenarios. This led me to foreground the processes through which learners construct responses under conditions of uncertainty, extending beyond scenario completion.

This also led me to consider whether grounding language learning in reasoning episodes may support memory by linking linguistic forms to meaningful processes. This connects to the proposal that commitment can be distributed across a response through cycles of committing, reopening, and re-weighting. This remains a classroom-derived hypothesis requiring investigation into its impact on retention, flexibility, and extended speaking performance.

I also recognise that the framework may represent retrospective rationalisation rather than a fully explanatory model and should therefore be applied cautiously. While Predictive Processing and Relevance Realisation already account for continuous updating, the present framework introduces a more explicitly structured account at the level of extended discourse. Its value lies

in making temporal organisation tractable where existing frameworks do not specify how commitment unfolds over time.

Overall, this study reorganised rather than replaced my practice. Prosodic differentiation, structured reasoning, and calibrated closure were already present; recognising commitment timing became the organising principle linking them. This represents a shift from technique-led instruction to process-oriented pedagogy. I therefore regard the framework as a provisional heuristic that now requires further empirical investigation.

APPENDICES

APPENDIX A. Multi-Level Architecture of Commitment-Timing Regulation Across Epistemic, Prosodic, and Acoustic Levels

Level	Function	What Exists at This Level	Relation to Pronunciation
Epistemic	Constrains what is being stabilised	Competing alternatives within local commitment cycles (independent of macro discourse stance)	Not directly accessible
Attunement	Organises when and how commitment occurs	Modulation of the duration for which alternatives are maintained (delay, weighting, closure, reopening)	Not acoustic
Prosodic	Multimodal temporal organisation (vocal, gestural, postural); speech as primary observable	Patterns of prominence, phrasing, contour, and coordinated timing	Structurally realised in speech but not reducible to acoustic signal
Acoustic (Pronunciation)	Auditory realisation in time	Physical signal (pitch, duration, intensity, pausing)	Functions as acoustic realisation (perceptual interface)

APPENDIX B. Linguistic and Prosodic Markers Associated with Relational Density Across Epistemic Commitment Phases

Marker Type	Linguistic / Prosodic Realisation	Epistemic Phase (Open / Bias / Commit / Reopen)	Function in RD (Expansion / Differentiation / Stabilisation / Reopening)	Academic Support
Epistemic Modality	might, could, may, must (epistemic use)	Open → Bias	Encodes graded commitment and preserves alternative possibilities prior to collapse	(Kratzer, 1981; Kratzer, 1991; Palmer, 2001; Nuyts, 2001)
Hedging / Epistemic Mitigation	perhaps, maybe, I think, it seems	Open → Bias	Reduces strength of assertion; signals epistemic distance and provisional weighting	(Hyland, 1998; Kärkkäinen, 2003)
Conditionals / Hypotheticals	if... then..., were..., assuming...	Open → Bias → Reopen	Structurally encodes alternative possible worlds; preserves branching relational trajectories	(Dancygier, 1998; von Fintel, 2011)
Concessive / Adversative Constructions	although, while, however, but	Bias → Reopen	Retains competing constraints within a single utterance; delays closure and enables recursive reorganisation	(Fraser, 1999; Couper-Kuhlen & Thompson, 2000)
Comparative / Contrastive Framing	rather than, on the one hand... on the other hand	Bias	Explicitly differentiates alternatives and foregrounds relational weighting	(Biber et al., 1999; Halliday & Matthiessen, 2014)
Evidential Marking	apparently, reportedly, according to X	Open → Bias	Marks source of knowledge; signals epistemic distance and non-ownership	(Chafe, 1986; Aikhenvald, 2004)
Stance Markers	I suppose, I would argue,	Open → Bias → Commit	Indexes speaker positioning relative to a	(Biber et al., 1999; Hyland, 2005)

Marker Type	Linguistic / Prosodic Realisation	Epistemic Phase (Open / Bias / Commit / Reopen)	Function in RD (Expansion / Differentiation / Stabilisation / Reopening)	Academic Support
	I'm inclined to think		proposition; tracks shifts in speaker stance without requiring stance commitment.	
Pre-nuclear Prominence / Contrastive Stress	Acoustic prominence before nuclear position	Bias	Signals relational differentiation and weighting without terminal collapse	(Ladd, 2008; Gussenhoven, 2004)
Pitch Range Expansion / Non-terminal Contours	Rising or level boundary tones; wide F0 variability	Open	Acoustically signals non-finality and ongoing structuring	(Ladd, 2008; Pierrehumbert, 1980)
Nuclear Focal Stress + Terminal Falling Contour	Final nuclear stress + falling boundary tone	Commit	Acoustically indexes stabilisation and closure	(Ladd, 2008; Cruttenden, 2014)
Pitch Reset / Rising Continuation Contour	F0 reset at new clause; rise after fall	Reopen	Signals discourse re-entry and re-expansion of relational field	(Gussenhoven, 2004; Brazil, 1997)
Extended Pre-commitment Pausing	Silent pause before nuclear stress	Open → Bias	Temporally suspends closure, allowing further relational differentiation	(Levelt, 1989; Goldman-Eisler, 1968)

APPENDIX C. Conceptual distinction between attunement, prosodic regulation, prosodic organisation, and pronunciation

Level	Role	Indicators
Attunement	regulation of commitment timing by modulating how long alternatives are maintained (agent–arena coupling)	—
Prosodic regulation	dynamic modulation of timing during unfolding action, realised in speech through (pacing · delay · emphasis · closure · re-entry)	timing shifts · emphasis changes
Prosodic organisation	resulting structured pattern across units (phrasing · prominence · contour)	tone units · stress placement · intonation
Pronunciation	acoustic signal	pitch · duration · intensity · pausing

APPENDIX D. Attunement Dynamics: Regulation of RD and Prosodic Realisation Across Epistemic Commitment Phases

LTA Phase	Attunement Function	Acoustic correlates of prosodic organisation	Local Epistemic Function
OPEN	Delaying closure to maintain multiple alternatives	Expanded pitch range; upward glides; non-terminal contour; longer pre-commitment pauses; delayed placement of nuclear stress	Alternatives remain co-present without selection
BIAS	Modulating emphasis to compare and weight alternatives	Contrastive stress on alternatives; pre-nuclear focal prominence; controlled tempo modulation; micro-pauses before emphasis	Alternatives are differentially weighted without resolution
COMMIT	Timing and reinforcing stabilisation of a selected alternative	Nuclear focal stress; terminal falling contour; tempo stabilisation; reduced pitch variability; phrase-final lengthening	A single alternative is locally stabilised
REOPEN	Re-initiating the field through renewed temporal expansion	Pitch reset (higher onset); rising or level continuation contour; re-initiation pause; renewed pitch variability	Previously stabilised commitment is returned to the alternative set

APPENDIX E. VP-Informed Pedagogical Regulation of Commitment Timing in IELTS Speaking Part 3 Tasks

Pedagogical Stage	Epistemic Process	Attunement (Regulatory Dynamics)	Prosodic Organisation → Pronunciation (Acoustic Realisation)
Input	Alternatives presented and framed through task prompt and model	Maintains openness across perspectives	Acoustic input present but not yet organised for controlled production
Annotation	Contrast identified	Locates contrast and transition points	Pause, reset, and prominence patterns identified perceptually
Controlled Production	Perspectives compared	Regulates timing of shift between alternatives	Structured pause, pitch reset, contrastive stress realised acoustically with falling contour marking closure
Dialogue	Uncertainty managed	Adjusts commitment in real time	Flexible timing and contour realised through dynamic stress and intonation
Pre-Structuring	Response trajectory anticipated	Prepares timing of shift and stabilisation	Planned pause, reset, and contour shaping prior to articulation
Re-engagement	Alternatives reintroduced	Releases prior commitment and reopens options	Pitch reset and continuation patterns realised acoustically
Full Production	Selection and extension of an alternative	Sustains regulation across pedagogical stages	Integrated timing and contour realised as coherent intonation with clear stabilisation points

APPENDIX F. Empirical Pressure Points on the Analytic Independence of Relational Density (RD)

Pressure Point	Failure Scenario	Challenge to the Framework	Implication
RD vs Structural Complexity	Multi-clausal, syntactically complex discourse in which clauses elaborate a single trajectory rather than maintaining alternatives	Structural complexity and relational differentiation may co-vary, making it difficult to determine whether alternatives are genuinely preserved or merely elaborated	RD risks partial redundancy with complexity measures if it cannot be distinguished in naturally occurring data
RD vs Processing / Fluency	Pauses, hesitations, and slowed delivery that may reflect either calibrated delay (regulation) or processing difficulty (breakdown)	Temporal features associated with attunement and processing limitation may be observationally indistinguishable, particularly in L2 speech where hesitation and restructuring co-occur	The framework may conflate regulatory timing with processing difficulty, weakening claims about attunement as a distinct mechanism

APPENDIX G. Prosodic and Epistemic Training in IELTS Speaking Part 1

Task Prompts and Model Responses

- **Do you like listening to music? What kinds of music do you enjoy?**
I'm really into music, mainly because I find it relaxing and it helps me feel calm, so when I have free time, I usually listen to pop or jazz
- **Do you prefer listening to music alone or with friends?**
I prefer listening to music alone, maybe because I find it easier to concentrate and enjoy the songs more, so when I'm alone, I usually put on my headphones and relax
- **How often do you listen to music?**
I tend to listen to music every day, mainly because it improves my mood and makes me feel more motivated, so if I have a long day, I always play some songs in the evening
- **Would you like to learn to play a musical instrument?**
Yes, I would like to learn the guitar, maybe because I find it interesting and enjoyable, so if I have enough time, I plan to take lessons
- **Have you ever been to a live concert?**
Yes, I have been to a live concert, mainly because I find live performances exciting, so when I went, I really enjoyed the atmosphere and energy
- **Who is your favourite musician or band?**
My favourite musician is Ed Sheeran, mainly because I find his songs emotional and easy to relate to, so when I listen to his music, I feel happy and relaxed

Stage 1: Prosodic Annotation (Chunking and Nuclear Stress)

Learners annotate responses for prosodic organisation.

- Pausing is aligned with punctuation and marked using /
- Chunking reflects **speech timing and grouping**, not logical structure
- Nuclear stress is identified within each chunk

Example:

I'm really into **music** / mainly because I find it **relaxing** / and it helps me feel **calm** / so when I have free **time** / I usually listen to pop or **jazz**

Chunking organises **delivery**, not reasoning structure

Stage 2: Logical Progression (Answer–Reason–Extend)

Learners identify the **logical structure** of the response:

- **Answer:** I'm really into music
- **Reason:** mainly because I find it relaxing and it helps me feel calm
- **Extend:** so when I have free time, I usually listen to pop or jazz

This structure supports **clarity and coherence in progression**

Stage 3: Controlled Production

Learners produce responses maintaining:

- prosodic organisation (chunking + nuclear stress)
- logical progression (Answer–Reason–Extend)
- appropriate intonation patterns

Stage 4: Reopening Layer (Extension Beyond Linear Model)

Learners extend the same response using a trigger expression:

- that said
- although
- unless

Example:

I'm really into music, mainly because I find it relaxing and it helps me feel calm, so when I have free time, I usually listen to pop or jazz / **that said** / *sometimes I prefer silence if I need to concentrate*

Stage 5: Prosodic and Embodied Marking of Reopening

Learners signal reopening through:

- pitch reset
- pause before trigger
- contrastive stress
- gesture and facial expression

Structural Relationship in the Task

- **Chunking (prosody)** → organises delivery
- **Answer–Reason–Extend (logic)** → organises progression
- **Reopening** → extends the progression beyond a single trajectory

Reopening is **built onto the linear model**, not part of it

APPENDIX H. Developing Coherent Justification through Functional Differentiation and Attunement

Activity Title: Affective vs Practical Reasoning with Timed Delivery

Aim

To develop learners' ability to produce coherent, structured responses by differentiating and organising reasons, while supporting attunement to how ideas are timed, weighted, and expressed during speaking.

Task Format

Question:

Do you enjoy reading?

Response Structure:

I'm really keen on [X], perhaps because:

- A. I find it [adjective] (affective reason)
- B. It helps me [base verb] (practical reason)

Example Response (with delivery focus)

I'm really keen on reading, perhaps because:

(pause)

A. I find it really relaxing and engaging (slight pitch expansion, reflective facial expression)

(pause)

B. It helps me improve my vocabulary and stay focused (clearer stress on "improve", controlled downward contour)

Procedure

1. Teacher introduces two functional categories:
 - Affective (how it feels)
 - Practical (what it does)
2. Students generate responses using both categories.
3. Students pause briefly before each reason, aligning pause placement with punctuation and clause boundaries.

4. Students practise delivering each reason with:
 - pitch movement (e.g. expansion for exploration, fall for completion)
 - stress on key words
 - simple hand gestures and facial expression to reflect and reinforce meaning
5. Students repeat with varied topics (e.g. music, exercise, travel).

Pedagogical Function

The task develops coherence by requiring learners to differentiate and organise reasons within a single response, rather than producing undirected justification. In line with the present study's definition of attunement as epistemically phase-sensitive regulation of commitment timing, this activity targets the early stages of differentiation and weighting prior to stabilisation.

It also supports attunement by requiring learners to time their responses through structured pauses, aligning delivery with the selection and organisation of meaning during the pre-commitment interval rather than continuous output.

The inclusion of pitch movement, stress, and simple embodied cues (gesture and facial expression) encourages learners to engage with the meaning of each reason, making relational weighting more perceptible during delivery, consistent with the treatment of prosody as an organisational system through which attunement dynamics are structured, and as realised acoustically in pronunciation.

Learners may also vary the prominence of each reason, allowing one to be foregrounded over another, introducing early-stage control over relational weighting and supporting the preservation of differentiated alternatives as described in RD (Porter, 2026), linking early embodied cueing to the later pragmatic establishment of stance through the coordinated selection of acoustic, lexical, and grammatical affordances within prosodically organised activity in agent–arena interaction.

This activity functions as an early-stage task within a broader progression toward extended relational structuring and reopening, as outlined in the pedagogical framework for commitment-timing training in Section 4.

Limitation

The activity supports structured differentiation and basic timing control but does not require learners to sustain, compare, or reorganise multiple alternatives across extended discourse, and may initially increase cognitive load as learners coordinate linguistic, prosodic, and embodied features simultaneously. Its function is therefore developmental rather than comprehensive.

APPENDIX I. Perspective Differentiation and Prosodic Contrast Management in IELTS Speaking Part 3

Activity Title

Perspective Contrast and Prosodic Pivoting in High-Uncertainty Tasks

Aim

To develop learners' ability to:

- construct and sustain alternative perspectives in response to high-uncertainty questions
- delay commitment before stabilisation
- use contrastive transition marking ("However,") to shift between perspectives
- organise responses through prosodic structuring (pause, contrastive stress, pitch contour)
- produce extended responses under conditions of uncertainty

Task Format

Model Question

Teachers may argue that using technology can be disruptive in the classroom. What would students think?

Model Response

Teachers may argue that using technology can be disruptive. However, students would say that it is incredibly useful for finding answers quickly.

Core Structure

- Clause A (initial perspective)
- Contrast transition marker ("However,")
- Clause B (contrasting perspective)

Stage 1: Input and Pattern Extraction

Teacher presents the model question and response.

Learners identify:

- two contrasting perspectives
- Clause A (given viewpoint)
- contrast transition marker ("However,")
- Clause B (alternative viewpoint)

- delayed commitment across clauses

Framework Note

- **Epistemic:** multiple perspectives activated
- **Attunement:** commitment remains open
- **Prosody:** not yet foregrounded
- **Function:** establishing the field of alternatives

Stage 2: Prosodic Annotation (Analysis)

Learners annotate:

Teachers may argue that using technology can be disruptive / however / students would say that it is incredibly useful

Focus:

- Clause A → level contour
- Pause
- “However,” → pitch reset
- Clause B → contrastive stress + **falling contour (closure)**

Framework Note

- **Epistemic:** contrast identified
- **Attunement:** **contrast transition point located**
- **Prosody:** organisation becomes visible
- **Pronunciation:** acoustic cues linked to function

Stage 3: Controlled Production Across Items

Learners produce responses using the same pattern.

Focus:

- Clause A → establish perspective
- Pause
- “However,” → contrast transition
- Clause B → contrast + **falling contour (stabilisation)**

Framework Note

- **Epistemic:** comparison enacted
- **Attunement:** timing of shift trained
- **Prosody:** structure reproduced

- **Pronunciation:** realisation of contrast and closure

Stage 4: A–B Dialogue (Active Listening Under Uncertainty)

Students receive different questions.

They must:

- interpret incoming perspective
- respond using contrast-transition structure

Framework Note

- **Epistemic:** uncertainty introduced
- **Attunement:** real-time adjustment
- **Prosody:** no longer pre-scripted
- **Function:** regulation under interaction

Stage 5: Prosodic Pre-Structuring

Before responding, learners:

- prepare Clause A
- plan contrast transition
- pre-set:
 - pause
 - pitch reset
 - contrastive stress
 - **falling contour for closure**

Framework Note

- **Epistemic:** response trajectory anticipated
- **Attunement:** pre-commitment regulation
- **Prosody:** planned before full content
- **Function:** structuring precedes formulation

Stage 6: Reopening and Extension

Learners extend responses:

Teachers may argue that technology is disruptive. However, students find it useful. That said, it may depend on how it is used.

Framework Note

- **Epistemic:** reopening alternatives
- **Attunement:** flexibility after stabilisation
- **Prosody:** reset and re-extension
- **Function:** preventing premature closure

Stage 7: Full Response Production and Stabilisation

Learners produce extended responses across multiple questions.

Framework Note

- **Epistemic:** full cycle (compare → select → extend)
- **Attunement:** sustained regulation
- **Prosody:** integrated across phases
- **Pronunciation:** continuous realisation

Expected Outcomes

Learners demonstrate:

- controlled contrast between perspectives
- accurate use of contrast transition marking ("However,")
- falling intonation marking closure
- delayed commitment and controlled stabilisation
- ability to operate under uncertainty

Pedagogical Function

- **Attunement** → trained through timing of shift and stabilisation
- **Prosody** → organises this timing
- **Pronunciation** → makes it observable

Key Principle

Contrast is not a grammatical feature.

It is a **temporally organised epistemic operation realised acoustically in speech.**

APPENDIX J. Illustrative Contrasts: RD vs Structural Complexity

This appendix provides illustrative examples demonstrating the distinction between RD and established measures of structural complexity and discourse organisation. Each example is analysed in terms of epistemic phase distribution (Open–Bias–Commit) and whether apparent expansion reflects genuine maintenance of alternatives or formulaic structuring.

Example 1: Formulaic Contrast Frame (False Positive RD)

“On the one hand, public transport is cheaper and more environmentally friendly. On the other hand, it can be unreliable and crowded. Overall, I think it depends on the situation.”

Analysis:

- Surface features:
 - Explicit contrast markers (“on the one hand... on the other hand...”)
 - Multiple alternatives presented
- Phase appearance:
 - Apparent Open–Bias–Commit sequence
- Interpretation:
 - Alternatives are introduced through a **pre-structured discourse template**
 - No evidence of sustained weighting or dynamic re-evaluation
- Conclusion:
Apparent Open–Bias expansion is formulaically generated and does not indicate independent RD.

Example 2: Enumerative Expansion (Complexity without RD)

“There are several reasons for this. Firstly, it is convenient. Secondly, it saves time. Thirdly, it is cost-effective. So overall, it is beneficial.”

Analysis:

- Surface features:
 - Increased clause count
 - Enumerative structuring (“firstly... secondly...”)
- Phase appearance:
 - Multiple points presented sequentially

- Interpretation:
 - Linear accumulation of supporting points
 - No competing alternatives or delayed stabilisation
- Conclusion:

Structural complexity is high, but RD is low, as the response follows a single trajectory.

Example 3: High Complexity, Low RD

“Although public transport reduces congestion and offers environmental benefits, it remains inefficient in many urban contexts, which is why I prefer driving.”

Analysis:

- Surface features:
 - Subordination and clause embedding
 - Evaluative stance
- Phase appearance:
 - Brief acknowledgement of alternatives
- Interpretation:
 - Rapid convergence on a single stance
 - Minimal maintenance of alternative trajectories
- Conclusion:

High syntactic complexity does not entail RD; commitment is early and dominant.

Example 4: Extended RD (Genuine Alternative Maintenance)

“Public transport reduces congestion, but it can be unreliable, especially at peak times, and in some cities it’s actually slower than driving, so I’m not sure which is better.”

Analysis:

- Surface features:
 - Contrastive structuring
 - Extended clause chaining
- Phase distribution:
 - Sustained Open–Bias phase

- Delayed Commit
- Interpretation:
 - Alternatives remain **co-present and dynamically weighted**
 - Commitment is postponed rather than pre-scripted
- Conclusion:

This constitutes genuine RD, as alternatives are maintained across phases prior to stabilisation.

Summary

These contrasts demonstrate that:

- Structural complexity and discourse organisation can simulate RD
- RD is only supported where alternative trajectories are actively maintained over time
- Formulaic discourse patterns may generate false positives, reinforcing the need for discriminant analysis against established measures

APPENDIX K. Pedagogical Procedures for Prosodic Regulation of Commitment Timing

This appendix provides illustrative pedagogical procedures corresponding to the regulation of commitment timing described in Section 4.

Example 1: Delaying terminal fall to maintain openness

The production of a falling nuclear contour is delayed until relational differentiation between alternatives has been established (Ladd, 2008). In practice, learners first produce clauses with level or slightly rising contours while introducing and comparing alternatives (e.g. “it can be expensive / and sometimes unreliable”), followed by a delayed falling contour only once a commitment is made (e.g. “so I’d avoid it”). This trains control over when closure occurs, rather than treating falling tone as a default sentence-final feature.

Example 2: Training pitch reset for reopening

Pitch reset is trained as a cue for evaluative reopening and contrastive shift (Brazil, 1997; Gussenhoven, 2004). Learners practise producing a marked pitch reset at the onset of a new unit (e.g. “but on the other hand...”), signalling the introduction of a competing perspective. This is rehearsed through contrast pairs where failure to reset pitch results in flattened interpretation. The focus is on re-opening the discourse field, not simply varying intonation.

Example 3: Using contrastive stress to weight alternatives

Use contrastive stress to signal the relative weighting of alternatives (Ladd, 2008). Learners practise shifting prominence across competing elements (e.g. “it’s CHEAP but not RELIABLE”), with feedback focused on how stress placement alters interpretation. Activities include reweighting the same utterance with different stress patterns to make epistemic weighting audible.

APPENDIX L. Phase Distribution Across Task Conditions (Operationalised via Ambiguity): RD-Based Behavioural Pattern

Task Type	RD (Open+Bias)	Commitment
Low ambiguity	~25–30%	High
High ambiguity	~65–90%	Low

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