



**ADVANCING INTROSPECTIVE LEADERSHIP:
POLYVAGAL THEORY, SELF-REGULATION,
AND LEADER-MEMBER EXCHANGE QUALITY**

Geoffrey A. Vanderpal

For PhD by Existing Published or Creative Works

A thesis submitted in partial fulfilment of the
requirements of the University of Sunderland
for the degree of PhD by Existing Published or Creative Works

July 2026

Abstract

Leadership theory has long treated introspection, autonomic self-regulation, and relational dynamics as separate domains, leaving practitioners without a unified framework that connects what happens inside a leader to what happens between a leader and those they lead. Distinct from empirical studies relying on primary data collection, this thesis employs a non-empirical, commentary-based synthesis methodology to construct a novel theoretical framework. The research gap informs the objective of the thesis, which is to establish a comprehensive neuro-relational model of introspective leadership that integrates Polyvagal Theory (PVT) and Leader-Member Exchange (LMX) theory. A further gap exists in that dominant leadership models, including servant, authentic, and transformational frameworks, neglect physiological dimensions in favour of follower outcomes and internalised behaviour. The resulting model connects relational effectiveness with a leader's internal self-regulation system, establishing a neurobiological framework upon which decision-making can be anchored. The systematic review yielded a final peer-reviewed corpus of 43 scholarly sources, selected through PRISMA-guided screening and synthesised using a GIOIA-informed commentary approach. The commentary-based synthesis conceptualises introspective leadership as an integration of reflective self-awareness, autonomic self-regulation, and dyadic trust processes expressed through leader–member exchanges. The model draws on LMX to define relational outcomes, including mutual influence, trust, and safety, while PVT provides the biological mechanism through which neuroception of safety and emotional regulation operates. Model development was guided by criteria of logical coherence, explanatory power, parsimony, and heuristic value. The neuro-relational model's principal contribution is integrating organisational leadership with neurobiological science, thereby offering a biologically-informed framework that can inform inclusive leadership practice, trauma-aware organisational responses, and ethical conduct. The model creates a recursive feedback loop informed by relationships, reflection, and physiology. Ultimately,

this thesis advances the proposition that leadership effectiveness is substantially contingent upon a leader's capacity for autonomic self-regulation, which shapes the quality and reliability of trust-centred leader–member exchange.

Keywords: Introspective Leadership, Polyvagal Theory, Leader-Member Exchange (LMX), Autonomic Self-Regulation, Neuroception, Non-empirical Synthesis, Theory Building

Acknowledgements

I wish to express my sincere gratitude to my academic supervisor at the University of Sunderland for their guidance, critical engagement, and encouragement throughout this doctoral journey. Their constructive feedback has been invaluable in sharpening the theoretical contribution of this work.

I am deeply grateful to my co-author and colleague, R. Brazie, whose intellectual partnership across six prior publications formed the empirical and conceptual foundation upon which this thesis is built. Our collaborative scholarship over more than five years has been a source of both rigour and inspiration.

I would also like to acknowledge the scholars whose foundational work on Polyvagal Theory, Leader-Member Exchange theory, and introspective leadership has made this synthesis possible. This thesis stands on the shoulders of their contributions.

Finally, my heartfelt thanks go to my family and professional colleagues for their patience, support, and belief in the value of this work throughout the years of its development.

Table of Contents

Abstract.....	ii
Acknowledgements.....	iv
List of Figures.....	vi
List of Tables.....	vii
List of Abbreviations.....	vii
Chapter 1: Introduction.....	1
1.1 <i>Background: The Modern Leadership Imperative.....</i>	<i>1</i>
1.2 <i>The Theoretical Gap: Integrating Mind, Body, and Relationship.....</i>	<i>3</i>
1.3 <i>Statement of the Problem.....</i>	<i>6</i>
1.4 <i>Purpose of the Study and Research Questions.....</i>	<i>8</i>
1.5 <i>Significance of the Study.....</i>	<i>11</i>
1.6 <i>The Structure of the Thesis.....</i>	<i>13</i>
1.7 <i>Thesis Submission Format: PhD by Prior Publication.....</i>	<i>15</i>
1.8 <i>Chapter Summary.....</i>	<i>17</i>
Chapter 2: Literature Review.....	18
2.1 <i>Introduction.....</i>	<i>18</i>
2.2 <i>Methodological Approach to Literature Selection (PRISMA-Guided, GIOIA-Informed)</i>	<i>19</i>
2.2.1 <i>Search Strategy.....</i>	<i>19</i>
2.2.2 <i>Search Terms.....</i>	<i>20</i>
2.2.3 <i>Inclusion and Exclusion Criteria.....</i>	<i>21</i>
2.2.4 <i>Search Execution and Final Corpus.....</i>	<i>23</i>
2.3 <i>The Rise of Introspective Leadership: A Call for Internal Clarity.....</i>	<i>30</i>
2.4 <i>The Neurobiology of Safety and Connection: A Polyvagal Perspective.....</i>	<i>32</i>
2.5 <i>The Relational Core of Leadership: Leader-Member Exchange (LMX) Theory.....</i>	<i>36</i>
2.6 <i>Synthesising the Silos: Towards a Neuro-Relational Model of Leadership.....</i>	<i>39</i>
2.6.1 <i>The Established Link: Introspection and LMX (Pillar 1 + Pillar 3).....</i>	<i>40</i>
2.6.2 <i>The Missing Mechanism: Neurobiology and Relational Dynamics (Pillar 2 + Pillar 3).....</i>	<i>41</i>
2.6.3 <i>The Leader's Intervention: Introspection as Neurobiological Regulation (Pillar 1 + Pillar 2).....</i>	<i>42</i>
2.7 <i>Identification of the Theoretical Gap and Contribution of the Present Thesis.....</i>	<i>44</i>
2.8 <i>Tabular Summary of Reviewed Literature.....</i>	<i>46</i>
2.9 <i>Chapter Summary.....</i>	<i>52</i>
Chapter 3: Methodology and Framework for Theoretical Integration.....	53
3.1 <i>Introduction: Charting a Path for Model Development.....</i>	<i>53</i>
3.2 <i>Philosophical Foundations of the Research.....</i>	<i>57</i>
3.3 <i>The Commentary-Based Synthesis Approach: A Method for Theory Building.....</i>	<i>61</i>
3.4 <i>Delineating the Corpus of Analysis.....</i>	<i>63</i>
3.4.1 <i>The Foundational Text: A Critical Review of Vanderpal and Brazie (2022a).....</i>	<i>64</i>
3.4.2 <i>The Supporting Literature: A Systematic Curation.....</i>	<i>65</i>
3.5 <i>The Process of Analysis and Synthesis.....</i>	<i>67</i>
3.5.1 <i>Thematic Analysis and Conceptual Deconstruction.....</i>	<i>67</i>
3.5.2 <i>The Integrative Framework: Constructing the Neuro-Relational Model.....</i>	<i>68</i>

3.5.3 Analytical Procedure and Coding Integrity.....	69
3.6 Ensuring Methodological Rigour and Trustworthiness.....	72
3.7 Chapter Summary.....	74
Chapter 4: Discussion.....	75
4.1 Recapitulation of the Integrated Model.....	75
4.2 Answering the Core Research Questions.....	77
4.2.1 The Neurophysiological Foundations of LMX (Answering RQ1).....	78
4.2.2 Introspection as an Interventional Practice for Autonomic Regulation (Answering RQ2).....	80
4.2.3 Formal Theoretical Propositions.....	82
4.3 Theoretical Contributions and Innovations.....	84
4.3.1 From Cognition to Embodiment: A Paradigm Shift in Leadership Theory.....	84
4.3.2 Re-conceptualising Introspection as a Psychophysiological Capacity.....	85
4.3.3 Providing the Missing Mechanism for Relational Leadership.....	85
4.4 Practical Implications for Organisational Practice.....	88
4.4.1 A New Frontier for Leadership Development.....	88
4.4.2 Building Trauma-Informed and Psychologically Safe Organisations.....	88
4.4.3 Re-imagining Core Leadership Functions.....	89
4.5 Limitations and a Generative Agenda for Future Research.....	90
4.5.1 Acknowledging the Conceptual Nature of the Thesis.....	91
4.5.2 A Proposed Programme for Quantitative Inquiry.....	91
4.5.3 A Proposed Programme for Qualitative Inquiry.....	92
4.6 Chapter Summary.....	93
Chapter 5: Conclusion.....	94
5.1 Synthesis of the Core Argument.....	94
5.2 The Enduring Significance of the Contribution.....	97
5.3 Concluding Reflection.....	98
5.4 Reflexivity and Author Positionality.....	98
5.5 Epistemological Limits and Scope of Claim.....	99
5.6 The Nature of the Truth Advanced in this Thesis.....	100
5.7 Integrated Contributions to Knowledge.....	103
References.....	107

List of Figures

Figure 1: The Neuro-Relational Model of Leadership (See Chapter 4 for full elaboration).....	14
Figure 2: PRISMA Flow Diagram.....	23
Figure 3: Literature Selection and Filtering.....	24
Figure 4: Theoretical Gap and Integration.....	45
Figure 5: Heatmap of Pillar Coverage by Category.....	50
Figure 6: Sources vs Pillars Heatmap.....	51
Figure 7: Gioia Data Structure for the Neuro-Relational Model.....	56

List of Tables

Table 1.1: Mapping of the Prior Publications to the Three Theoretical Pillars and the Neuro-Relational Model.....	16
Table 1: Literature Selection and Filtering Matrix.....	27
Table 2: Article Identification Audit Trail (Keywords and Databases).....	28
Table 3: Summary of Key Literature.....	47
Table 4: Gioia Data Structure: First-Order Concepts, Second-Order Themes, and Aggregate Dimensions.....	57
Table 5: A Comparison of Leadership Paradigms.....	87
Table 6: Findings in Relation to Research Questions.....	101

List of Abbreviations

DVC-Dorsal Vagal Complex

IPL-Introspective and Inclusive Personal Leadership

LMX-Leader-Member Exchange

PRISMA-Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PVT-Polyvagal Theory

SNS-Sympathetic Nervous System

VVC-Ventral Vagal Complex

Chapter 1: Introduction

This chapter establishes the foundational rationale for the thesis. It opens by contextualising the modern leadership challenge and identifying the theoretical gap that motivates the study: the absence of an integrated neurobiological and relational framework within the introspective leadership literature. It then presents the problem statement, the research questions and objectives, and the significance of the proposed contribution. The chapter concludes by outlining the structure of the thesis and the logic of the argument developed across its five chapters. Readers are oriented to the Golden Thread that runs through the thesis: the proposition that a leader's capacity for autonomic self-regulation is not peripheral but constitutive of their relational effectiveness.

1.1 Background: The Modern Leadership Imperative

Modern organisations ask leaders to perform under conditions that would stress even the most capable: rapid change, relational complexity, and the expectation that sound judgement will prevail even when everything feels uncertain. The challenge, increasingly, is not only external. It is internal. As Hartung (2020, p. 1) reflects, “many answers are not to be found outside but rather inside us.” Organisations today demand leaders who can recover from failure, regulate emotions, and lead with authenticity amidst high-pressure, feedback-intensive environments. Yet many leaders, unprepared to navigate such challenges, find themselves spiraling into paralysis, shame, or reactive behaviours that erode team trust and psychological safety (Boss and Sims, 2008). As these scholars note, failure is inevitable, but responses to failure vary widely. Some leaders move towards growth, while others remain stuck. What distinguishes those who recover and grow from those who do not is rarely technical skill. More often, it is an internal capacity for reflection, self-leadership, and the regulation of emotional response under pressure.

It is in this context that introspective leadership emerges as a critical yet under-theorised framework. At its foundation, introspective leadership rests on a leader's

commitment to ongoing self-reflection, personal growth, and relational authenticity. Johnson (2023, p. 45) defines it as a “cyclical and interdependent process,” where reflective practice becomes the key driver of ethical decision-making, transparency, and trust. Her framework identifies six foundational traits: self-awareness, emotional intelligence, humility, empathy, active listening, and continuous reflection. Each of these contributes to the leader’s ability to inspire, navigate conflict, and build sustainable relationships (Johnson, 2023; Daudelin, 1996; Gustafson, Short and Hamilton, 2022). However, despite growing scholarly interest, introspective leadership is rarely studied in relation to the biological and relational mechanisms that underpin its enactment. Instead, it is most often discussed as a cognitive-behavioural competency, as if reflection enough can reliably translate into composure, fairness, and relational repair in real time. Consequently, the assumption becomes fragile precisely where leadership matters most: under stress, threat, and emotional intensity. Specifically, there is a lack of integration between the neurophysiological self-regulation described by Polyvagal Theory (PVT) and the relational dynamics captured by Leader-Member Exchange (LMX) theory. The central concern motivating this thesis is that introspective leadership cannot be fully understood or developed if it is treated only as a mindset or technique; it must also be examined as an embodied and relationally enacted capacity, shaped by neurophysiological state and dyadic trust dynamics. It argues that the autonomic nervous system (ANS) serves as the foundation for workplace dynamics, moving beyond threat-based reactions towards a "social engagement system" necessary for high-quality LMX. This thesis focuses on feedback-intensive leader–follower interactions (e.g., performance feedback, corrective conversations, coaching, selection interviews, and evaluative exchanges) because these episodes reliably heighten interpersonal risk and therefore most clearly expose the mechanisms linking leader autonomic state, reflective access, and dyadic trust formation. The thesis does not attempt to explain all leadership phenomena (e.g., macro strategy, structural power dynamics, or organisational design), but

instead concentrates on the micro-mechanisms through which leaders maintain or lose relational safety in high-stakes interpersonal moments.

1.2 The Theoretical Gap: Integrating Mind, Body, and Relationship

Despite expanding interest in introspective leadership, the literature remains conceptually fragmented at the level where leadership is most consequential: the moment-to-moment conditions under which leaders must interpret social cues, regulate emotion, and deliver feedback that either stabilises or destabilises trust. Introspective leadership scholarship has made important strides in defining reflective practice and its ethical significance. Johnson (2023) characterises introspective leadership as a cyclical and interdependent process in which self-awareness, humility, empathy, and continuous reflection support transparency and principled decision-making. In a complementary stream, Woelfel (2024) advances the Introspective and Inclusive Personal Leadership (IIPL) Approach, linking introspection to design thinking and creative problem-solving. Woelfel operationalises introspection through structured tools such as the *ikigai* diagram, which maps purpose across values, skills, needs, and income potential, using structured identity-mapping and purpose-clarification tools, including meaning-centred frameworks such as *ikigai* (Kamiya, 1966; Woelfel, 2024). Collectively, these contributions clarify that introspection is not merely an abstract disposition, but a teachable and repeatable practice with implications for authenticity and ethical conduct.

However, these frameworks remain largely cognitive and behavioural in orientation. They often imply that reflective intent will translate reliably into regulated action in complex interpersonal environments. Leaders frequently operate in feedback-intensive settings characterised by evaluation pressure, ambiguity, and interpersonal risk, conditions that can elicit autonomic threat responses. When a leader's physiological state shifts towards stress-related activation, the capacity to access reflection, accurately perceive social cues, and communicate with relational safety can degrade. Traditional leadership theories, including

transformational, transactional, and servant leadership, provide valuable insights into observable leader behaviours and follower outcomes, but they tend to under-specify the internal neurophysiological and interpersonal processes that shape real-time leadership functioning (Amanchukwu, Stanley and Ololube, 2015). As a result, scholarship can describe what effective leadership looks like, while offering limited explanation of how leaders sustain reflective clarity and relational attunement under stress.

This thesis addresses that limitation by integrating Polyvagal Theory (PVT) and Leader-Member Exchange (LMX) theory to specify the biological and relational mechanisms through which introspective leadership is enacted. Developed by Porges, PVT offers a neurobiological account of how autonomic states influence emotion regulation, threat perception, and social engagement capacity (Porges, 2018). Within this framework, ventral vagal regulation supports social connection behaviours that are central to introspective leadership, including empathic attunement, composure, and prosocial communication (Flores and Porges, 2017). In contrast, heightened sympathetic activation can narrow attentional bandwidth, increase reactivity, and reduce reflective access, while more severe threat responses can impair engagement altogether. These state shifts have direct implications for leadership because they shape the leader's capacity to interpret facial expression, tone, and interpersonal nuance, which can contribute to miscommunication, compromised decision-making, and relational strain (Porges, 2018; Kolacz et al., 2019). In this way, PVT provides a mechanism-level explanation for why introspective leadership may be unevenly enacted across contexts, even when leaders endorse reflective values and practices. Recent empirical work further suggests that autonomic regulation practices are associated with improved relational coherence, morale, and resilience in team settings (Rao et al., 2024).

While PVT explains the physiological conditions that enable or constrain reflective leadership, LMX theory explains how leadership effectiveness is constructed through dyadic relationship quality. LMX posits that leadership is not solely a set of leader traits or

behaviours, but a relational process shaped through exchanges characterised by trust, respect, and mutual influence (Graen and Uhl-Bien, 1995). Importantly, these exchanges occur within an affective context, and the quality of feedback interactions often becomes a decisive mechanism through which trust is built or degraded. Alo and Arslan (2022) provide empirical support for this mechanism by showing that supervisory feedback delivery tactics shape LMX quality. Constructive and emotionally attuned feedback is associated with psychological safety, commitment, and satisfaction, whereas feedback perceived as impersonal or negative contributes to relational strain, reduced morale, and increased intent to leave. Consequently, LMX scholarship typically models dyadic trust at interpersonal and behavioural levels, while giving limited attention to the physiological conditions that shape leaders' capacity for attunement during exchange episodes. Importantly, the relational "output" of this neuro-relational system is not only LMX quality but also downstream outcomes such as psychological safety and employee voice. When leaders remain regulated and deliver feedback with attunement and fairness, followers are more likely to speak up with improvement suggestions and risk disclosures; behaviours that are essential for learning, inclusion, and error prevention in complex organisations. This thesis therefore treats psychological safety and voice as practical indicators of whether introspective leadership is being enacted as relational safety rather than as private reflection alone.

The integration of PVT and LMX becomes especially salient when leadership is examined in contexts shaped by chronic stress or unresolved trauma. Vanderpal and Brazie (2022c) argue that stress-related autonomic dysregulation can interfere with fairness, emotional availability, and bias regulation in selection and workplace relationships, thereby linking physiological state to organisationally consequential judgments. Crucially, this extends beyond interpersonal dynamics to decision-making itself. As Vanderpal and Brazie (2022b) identify, physiological threat responses manifest as tangible cognitive biases, such as loss aversion or impulsive risk-taking, further evidencing that a dysregulated nervous system

universally impairs rational evaluation. Kolacz et al. (2019) similarly demonstrate that autonomic dysregulation rooted in adverse experiences undermines relational engagement and cognitive-emotional integration, capacities that are foundational for sustaining high-quality leader-member exchanges. Synthesised, these perspectives support a coherent theoretical proposition: introspective leadership should be conceptualised as an embodied capability whose reliability depends on autonomic regulation, and whose organisational impact is realised through dyadic exchanges that accumulate into trust, psychological safety, and retention-related outcomes.

The central theoretical gap this thesis addresses is therefore not the absence of introspection in leadership studies, nor the absence of biological or relational theories in adjacent literatures. The gap is the lack of an integrated neuro-relational account that explains how introspective practices translate into consistent relational safety through identifiable mechanisms. Without such integration, leadership development risks remaining behaviour-focused and technique-driven, emphasising visible competencies while neglecting the internal states that enable leaders to enact behaviours reliably under pressure (Porges, 2018; Tang et al., 2015; Dulebohn et al., 2012). By bringing PVT and LMX into explicit dialogue with introspective leadership, this thesis lays the foundation for a neuro-relational model that can guide both theory refinement and the design of leadership development practices grounded in regulation, reflective capacity, and trust-centred exchange processes. Ultimately, this thesis' fundamental truth is that leadership is not solely cognitive or behavioural. It is also physiological, in the sense that a leader's capacity for reflective clarity and relational safety is constrained by autonomic state regulation.

1.3 Statement of the Problem

In one sentence: this thesis argues that a leader's capacity for autonomic self-regulation, mediated by introspective practice, is the neurobiological precondition through which high-quality leader-member exchange is built, sustained, and, when absent, systematically eroded.

Although leadership research increasingly values introspection, the empirical and theoretical literatures remain compartmentalized in ways that limit explanatory power and practical application. Introspective leadership scholarship has primarily examined reflective practice as a cognitive and behavioural phenomenon. For example, Johnson (2023) and Woelfel (2024) elaborate introspection as a developmental process linked to authenticity, ethical conduct, and inclusive leadership, yet these accounts do not specify the biological conditions that enable reflection under stress or the relational mechanisms through which introspective intent becomes observable as trust and psychological safety in workplace exchanges. In parallel, Polyvagal Theory provides a robust neurobiological framework for understanding autonomic regulation and state-dependent social engagement (Porges, 2018), while Leader-Member Exchange theory explains leadership effectiveness through dyadic relationship quality characterised by trust, respect, and mutual influence (Graen and Uhl-Bien, 1995). However, these frameworks have rarely been integrated to explain how leaders translate internal reflection into consistent relational effectiveness, particularly in feedback-intensive environments.

This disconnect constitutes the central theoretical problem addressed in this thesis. The field currently lacks an integrated neuro-relational model of introspective leadership that explains how autonomic state regulation shapes a leader's capacity for reflective clarity, how that capacity influences feedback behaviours, and how feedback exchanges accumulate into higher or lower quality leader-member relationships over time. Without such integration, leadership theory remains under-specified at the mechanism level, and leadership development programmes continue to emphasise visible behaviours and competencies while neglecting the physiological and relational systems that sustain those behaviours in high-pressure contexts.

Prior scholarship provides important building blocks for this integration, but it remains fragmented. Vanderpal and Brazie (2022a) demonstrate that stress and trauma

influence leadership behaviour through autonomic dysregulation, with implications for evaluation fairness, bias regulation, and relational functioning. Alo and Arslan (2022) show that feedback delivery tactics shape LMX quality by strengthening or weakening psychological safety, commitment, and job satisfaction. Yet these mechanisms are typically examined in isolation, which prevents the literature from explaining how leaders' physiological regulation and feedback practices operate together as mutually reinforcing processes that shape trust and psychological safety across time.

The absence of an integrated model also limits leadership development and organisational practice. Many programmes train interpersonal techniques and leadership scripts without addressing the regulatory capacity required to enact them consistently under stress. Programs lacking this integration risk becoming compliance-oriented and performative rather than transformative and capacity-building, because they under-specify the regulatory capacity required to enact relational behaviours under stress (Porges, 2018; Kolacz et al., 2019). Without explicitly connecting self-regulation to dyadic trust dynamics, organisations may underestimate how leaders' internal states influence relational safety, bias vulnerability in evaluative situations, and longer-term outcomes such as engagement and retention.

1.4 Purpose of the Study and Research Questions

This thesis builds upon my prior (Vanderpal and Brazie, 2022a), which established evidence that unresolved stress and trauma, conceptualised through Polyvagal Theory, can shape leadership behaviour and decision-making through autonomic dysregulation. Since it is submitted as a PhD by Prior Publication, the work does not present a new empirical framework or primary data collection. Instead, I employ a theoretical critical analysis of my previously published works, synthesising them with current literature to construct a neuro-relational model, relying on a systematic review and theoretical synthesis of texts as opposed to empirical observation. In Vanderpal and Brazie (2022c), autonomic dysregulation associated with stress was shown to influence relational behaviours and bias-related

processes within recruitment and feedback interactions. While that work focused on human resource management contexts, the present thesis extends the contribution by developing a comprehensive neuro-relational model that integrates introspective leadership theory with Polyvagal Theory and Leader-Member Exchange theory. The aim is to explain, at a mechanism level, how reflective leadership is enabled or constrained by physiological regulation and how its organisational impact is realised through dyadic exchanges that build or erode trust.

At the centre of this model is a reframing of introspection as a neurobiologically informed and relationally grounded leadership capacity. Within this framework, self-awareness is linked to the autonomic nervous system's capacity to detect and respond to cues of safety, threat, or mobilisation, which in turn influences reflective access, emotional regulation, and the leader's ability to foster trust in interpersonal exchanges (Porges, 2018; Kolacz et al., 2019). Simultaneously, LMX theory is used to examine how dyadic interaction quality, mediated by feedback dynamics, emotional attunement, and mutual respect, can enhance or inhibit leaders' introspective functioning and relational coherence (Graen and Uhl-Bien, 1995; Alo and Arslan, 2022). In this way, the thesis specifies a reciprocal process in which physiological state shapes feedback behaviour and exchange quality, and exchange quality reinforces or destabilises the conditions for ongoing introspective regulation.

This thesis addresses the following aim, research questions, and objectives:

Aim:

- To develop a comprehensive neuro-relational model of introspective leadership that integrates Polyvagal Theory and Leader-Member Exchange theory.

Research Questions:

1. How do leaders' neurophysiological states, as explained by Polyvagal Theory, influence the quality of leader-member exchanges in feedback-intensive environments?

2. How can introspective leadership practices mediate the relationship between autonomic regulation and inclusive, trust-centred leadership outcomes?

Objectives:

- To explicate how autonomic regulation influences leaders' relational feedback interactions and outcomes.
- To clarify mechanisms through which introspective practices foster psychological safety and trust-based relationships.
- To extend existing leadership models by integrating neurobiological insights with relational leadership practices.

Addressing this gap advances leadership studies by linking internal regulation to interpersonal effectiveness. The proposed neuro-relational model conceptualises leadership as a dynamic feedback loop between physiological state, reflective capacity, and relational behaviour. It contributes theoretically by integrating PVT and LMX within an introspective leadership framework, and it contributes practically by offering a foundation for trauma-informed and inclusive leadership development focused on regulation and trust-centred exchange processes. Watts (2012) positions introspection as a learnable and transferable skill that forms the internal architecture of authentic leadership. This aligns with Polyvagal Theory's emphasis on regulation as a prerequisite for reflective clarity (Porges, 2018) and with LMX theory's focus on fairness, mutual respect, and reciprocity in dyadic relationships (Graen and Uhl-Bien, 1995). Together, these frameworks provide scaffolding for operationalising introspective leadership in organisational contexts.

Watts (2012) further argues that introspection can be systematised through executive coaching, feedback mechanisms, and structured leadership development programmes. This supports the thesis's position that introspection can be operationalised through the combined cultivation of autonomic regulation and high-quality feedback loops consistent with LMX theory (Graen and Uhl-Bien, 1995; Alo and Arslan, 2022). When embedded in organisational

leadership development frameworks, this model strengthens individual executive functioning while also supporting collective outcomes such as trust, engagement, and retention (Dulebohn et al., 2012; Vanderpal and Brazie, 2022a).

On a personal level, this thesis is motivated by the author's experience as a practising executive, educator, and organisational consultant over more than two decades. In that time, it has been observed repeatedly that leaders with sophisticated cognitive and behavioural skills nonetheless struggle to sustain relational effectiveness under organisational pressure. The author's own published work with Brazie (2022, 2023, 2024) repeatedly encountered this pattern: stress, trauma, and autonomic dysregulation appeared to undermine what leaders cognitively knew how to do. The present thesis is therefore not only a theoretical project but a response to a practical puzzle that has occupied the author's professional life: why does good leadership knowledge not reliably translate into good leadership impact? The answer this thesis advances, that the missing variable is physiological, not cognitive, reflects both the scholarly synthesis presented here and the lived observation that motivated it.

1.5 Significance of the Study

This thesis contributes to the evolving discourse on leadership by advancing a biologically informed and relationally responsive model of introspective leadership. Its primary theoretical contribution is the integration of Polyvagal Theory and Leader-Member Exchange theory to explain how leaders' internal regulation shapes the relational conditions under which trust, psychological safety, and inclusive exchange processes are sustained. By linking autonomic state regulation to dyadic relationship quality, the thesis challenges behaviourist approaches that emphasise observable leadership techniques while under-theorising the embodied and relational mechanisms through which leadership is enacted in feedback-intensive settings. In contrast, the neuro-relational model developed here positions leadership effectiveness as contingent upon the leader's capacity to regulate autonomic

responses, access reflective clarity under pressure, and engage in feedback exchanges that promote mutual respect and accountability.

The significance of this contribution lies in the explanatory precision the model offers. Introspective leadership has often been framed as a reflective intention or set of developmental practices, yet the field has not sufficiently clarified why introspection translates into relational safety in some contexts but deteriorates into reactivity in others. Polyvagal Theory provides a mechanism-level basis for understanding that variability by specifying how state-dependent shifts in the autonomic nervous system influence social engagement, cue perception, and emotional regulation (Porges, 2018; Kolacz et al., 2019). LMX theory provides a complementary relational account by explaining how trust and influence are constructed through repeated dyadic exchanges, particularly those involving feedback, recognition, and corrective communication (Graen and Uhl-Bien, 1995; Alo and Arslan, 2022). The thesis integrates these perspectives to clarify how physiological regulation and exchange quality interact over time, thereby supplying a coherent foundation for future hypothesis generation and empirical testing.

This thesis also contributes to leadership development and organisational practice by offering a model that can inform the design of trauma-informed and inclusive leadership interventions. Programs that focus exclusively on communication techniques or competency checklists may fail to produce durable change if leaders remain physiologically dysregulated during high-stakes interactions. In contrast, training approaches that incorporate autonomic awareness and self-regulation can strengthen leaders' capacity to deliver feedback with attunement, fairness, and relational safety, thereby supporting trust and retention-related outcomes (Vanderpal and Brazie, 2022a; Dulebohn et al., 2012). While critics argue that integrating introspective leadership with neurophysiological theories may raise concerns about conceptual clarity and empirical validation (Gardner et al., 2021), this thesis responds by grounding its claims in established theoretical frameworks and by drawing on empirical

work that links autonomic regulation to relational functioning and organisationally consequential judgments (Kolacz et al., 2019; Vanderpal and Brazie, 2022a). The practical implication is that leadership development can be made more transformative when it targets the internal regulatory capacities that make relational leadership behaviours reliably enactable under stress.

Overall, this thesis contributes by:

- a) **Theorizing mechanism:** specifying how leader autonomic state constrains or enables reflective access and prosocial communication during feedback episodes;
- b) **Linking physiology to relationship:** integrating PVT with LMX to explain how dyadic trust is built or eroded through state-shaped exchanges;
- c) **Extending outcomes:** positioning psychological safety and voice as observable relational indicators of successful introspective enactment;
- d) **Design implications:** offering a foundation for regulation-informed, trauma-aware leadership development that targets capacity, not only technique.

1.6 The Structure of the Thesis

The structure of this thesis is organised to reflect both the theoretical depth and integrative nature of this commentary-based contribution to leadership studies. Rather than presenting new empirical data, this thesis draws on a systematic synthesis and critical commentary of the author's previously published works, supported by current literature in introspective leadership, polyvagal theory (PVT), and leader-member exchange (LMX). Following this introduction, Chapter 2 provides a structured literature review, highlighting the evolution of introspective leadership concepts and identifying the underexplored intersections with neurobiological and relational frameworks. Chapter 3 presents the methodological orientation of the thesis, describing the approach to selecting, organising, and analysing both the author's contributions and supporting literature. Chapter 4 synthesises and integrates the key themes across the author's work, examining how introspective leadership

functions as a neuro-relational construct when viewed through the dual lenses of PVT and LMX theory. Finally, Chapter 5 offers a reflective discussion of the theoretical contributions, implications for leadership practice, and future research directions, particularly in the context of trauma-informed leadership development, inclusive organisational cultures, and embodied decision-making frameworks.

The Neuro-Relational Model of Leadership

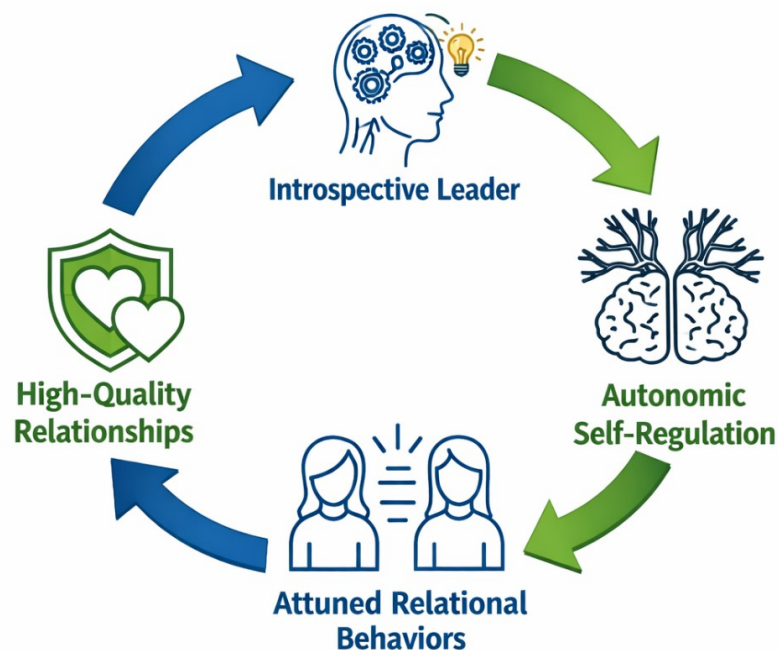


Figure 1: The Neuro-Relational Model of Leadership (See Chapter 4 for full elaboration)

Figure 1 provides an overview of the neuro-relational model developed in this thesis. The diagram depicts the three theoretical pillars, introspective leadership, Polyvagal Theory, and Leader–Member Exchange, and illustrates the proposed directional relationships between autonomic self-regulation, neuroceptive signalling, feedback attunement, and dyadic trust. The feedback loop at the model’s centre reflects the recursive relationship in which high-quality relational exchanges reinforce the leader’s regulatory capacity, while dysregulated interactions erode it. The model is presented here as an advance organiser for the reader; each component and relationship is developed, justified, and discussed in full in Chapter 4.

1.7 Thesis Submission Format: PhD by Prior Publication

This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy (PhD) by Prior Publication at the University of Sunderland. The PhD by Prior Publication route recognises that a substantial body of original scholarly work, developed and published through the peer-review process, can constitute the primary evidence base for a doctoral thesis. Under this format, the candidate submits a critical commentary that synthesises the prior publications, situates them within a coherent theoretical framework, demonstrates their cumulative contribution to knowledge, and reflects on the scholarly journey they represent.

The prior publications that constitute the evidential foundation of this thesis are as follows: Vanderpal and Brazie (2022a) conducted an exploratory study of how Polyvagal Theory and underlying stress and trauma influence major leadership approaches; Vanderpal and Brazie (2022b) investigated the influence of basic human behaviours on investor behaviour and financial bias; Vanderpal and Brazie (2022c) examined the impact of underlying stress and trauma on HRM recruitment and selection bias; Brazie and Vanderpal (2023a) co-authored *Steadfast Leader*, a practitioner-oriented application of the neuro-relational framework; Vanderpal and Brazie (2023b) explored how Polyvagal Theory and the autonomic nervous system impact organisational performance through reduced employee turnover and improved work culture; and Vanderpal and Brazie (2024) integrated Polyvagal Theory with agile project management. Collectively, these publications establish an original programme of scholarship that applies neurobiological theory, particularly Polyvagal Theory, to leadership, organisational behaviour, and human performance.

To make the collection's role explicit, Table 1.1 maps each prior publication to the theoretical pillars it informs and to its specific contribution to the neuro-relational model. It serves as an advance organiser for the commentary, signposting how the individual works are drawn together in the synthesis developed in Chapters 2 and 4.

Table 1.1: Mapping of the Prior Publications to the Three Theoretical Pillars and the Neuro-Relational Model

Publication	Pillars	What it established	Contribution to the neuro-relational model
Vanderpal and Brazie (2022a), Journal of Applied Business and Economics	P1, P2	Unresolved stress and trauma dysregulate the autonomic nervous system and shape a leader's prevailing transactional, transformational, or servant style.	Provides the foundational bridge from autonomic state to leadership approach on which the model's core premise rests.
Vanderpal and Brazie (2022b), Journal of Accounting and Finance	P1, P2 (P1 indirect)	Sympathetic and dorsal states produce systematic decision biases, showing that physiological arousal impairs rational evaluation.	Evidences the mechanism by which dysregulation degrades a leader's judgement and decision capacity.
Vanderpal and Brazie (2022c), Journal of Leadership Accountability and Ethics	P1, P2, P3	Recruiter stress and trauma amplify implicit and explicit bias in dyadic recruiter and applicant evaluation.	Links Pillars 2 and 3 by locating the pathway from dysregulation to relational strain; Pillar 1 is indirectly implicated through recruiter self-awareness and bias-monitoring.
Brazie and Vanderpal (2023a), Steadfast Leader (McGraw Hill)	P1, P2, P3	Defines instinctive leadership as the integration of rational and non-rational decision-making through an optimal autonomic state, with concrete self-regulation methods and cues of safety for co-regulating teams.	Operationalises the whole model across all three pillars, translating the synthesis into practitioner method.
Vanderpal and Brazie (2023b), Journal of Strategic Innovation and Sustainability	P2, P3	Sustaining employees in a ventral vagal state through cues of safety and trust reduces turnover, and engages Leader-Member Exchange directly.	Supplies the Pillar 3 outcome evidence linking a regulated relational climate to retention and LMX quality.
Vanderpal and Brazie (2024), Journal of Organizational Psychology	P2, P3	Co-regulation and psychological safety underpin team effectiveness under pressure, tying autonomic state to communication and collaboration.	Specifies the co-regulation mechanism through which leader and team physiological states shape relational and team outcomes.

This thesis synthesises, extends, and theoretically consolidates this body of work by constructing the neuro-relational model of introspective leadership. This model represents the original theoretical contribution that the prior publications individually approached but did not collectively articulate as a unified framework. The commentary-based synthesis methodology employed in Chapter 3 is the vehicle through which those publications are integrated with the broader literature to produce the model. The two research questions that animate this thesis, concerning the influence of neurophysiological states on LMX quality, and the mediating role of introspective practice, are addressed by drawing on both the prior publications and the 43-source peer-reviewed corpus assembled through systematic review.

1.8 Chapter Summary

This chapter has established the intellectual foundation of the thesis. It has identified a persistent gap in leadership theory: the absence of an integrated account of how a leader's internal physiological state shapes relational outcomes. It has framed the research problem, stated two research questions, and articulated a set of objectives that guide the synthesis developed in the subsequent chapters. The significance of this work, for leadership theory, development practice, and organisational equity, has been outlined. The following chapter reviews the three bodies of literature that constitute the theoretical foundations of the neuro-relational model: introspective leadership, Polyvagal Theory, and Leader-Member Exchange theory.

Chapter 2: Literature Review

This chapter provides the literature review underpinning the thesis. It is organised around the three theoretical pillars of the neuro-relational model: introspective leadership (Section 2.3), Polyvagal Theory (Section 2.4), and Leader-Member Exchange theory (Section 2.5). The chapter then synthesises these pillars, identifying the existing connections between them and, critically, the gaps that no prior work has bridged (Sections 2.6 and 2.7). A tabular summary of the reviewed literature is provided in Section 2.8. Throughout, the review is structured to answer the question: what is already known, what is missing, and how does the present thesis fill that gap? The chapter directly informs Research Question 1, concerning the influence of neurophysiological states on LMX quality, and Research Question 2, concerning introspective practices as mediators of autonomic regulation and trust.

2.1 Introduction

The central aim of this thesis is to develop a comprehensive neuro-relational model of introspective leadership by integrating Polyvagal Theory (PVT) and Leader-Member Exchange (LMX) theory. To achieve this, a thorough examination of the existing literature is necessary to situate the current research, identify the theoretical foundations upon which this model is built, and clearly articulate the conceptual gap this work intends to fill. The preceding chapter introduced the pressing need for leaders who possess not only external competencies but also a profound capacity for internal regulation and relational depth. This chapter substantiates that need by systematically reviewing three primary, yet often siloed, bodies of literature: (1) the evolving concept of introspective leadership and its focus on internal states; (2) the neurobiological framework of Polyvagal Theory, which explains the physiology of safety and connection; and (3) the relational dynamics of leadership as captured by Leader-Member Exchange theory.

This review is structured to directly inform the research questions and objectives of this thesis. It will first explore each theoretical pillar independently to establish its core

principles. Subsequently, it will synthesise these pillars, examining the existing research that connects them and, more importantly, highlighting where such connections are tenuous or absent. In doing so, this chapter will build a compelling case for the necessity of a new, integrated model. Specifically, this review will address:

- How leaders' neurophysiological states influence leader-member exchanges (Research Question 1).
- How introspective practices can mediate the relationship between autonomic regulation and trust-centred outcomes (Research Question 2).
- The mechanisms through which autonomic regulation influences feedback (Objective 1), how introspection fosters psychological safety (Objective 2), and how integrating these insights extends existing leadership models (Objective 3).

By the chapter's conclusion, the theoretical scaffolding for a neuro-relational model of introspective leadership will be firmly in place, demonstrating that such a model is not merely novel but essential for advancing both the theory and practice of leadership in the 21st century.

2.2 Methodological Approach to Literature Selection (PRISMA-Guided, GIOIA-Informed)

To ensure a rigorous and relevant foundation for this thesis, a systematic approach was employed to identify, screen, and select the literature. The methodology was designed to capture both the foundational texts and the contemporary research at the intersection of leadership, neurobiology, and relational science.

2.2.1 Search Strategy

The search strategy was organised around the three core conceptual pillars of this thesis: (1) Introspective and Internal Leadership, (2) Neurobiology and Polyvagal Theory, and (3) Relational Dynamics and LMX. The goal was to find literature within each pillar as well as the crucial, yet less common, research that bridges them. The primary search strategy involved combining keywords from at least two of the three pillars to locate integrative

works, while secondary searches focused on a single pillar to ensure foundational theories were included.

2.2.1.1 Database and Coverage

To enhance disciplinary breadth and reduce database bias, searches were conducted in Web of Science Core Collection, Scopus, PsycINFO, Business Source Complete (EBSCO), and Google Scholar (for forward/backward citation tracing). Coverage spans January 1995–June 2025, capturing the maturation of LMX and the emergence of Polyvagal Theory applications to social behaviour as well as contemporary work on introspective leadership.

2.2.2 Search Terms

To enhance transparency, Table 1 reports the yield of each keyword cluster (initial hits, screened records, and final included studies), and Table 2 provides an auditable trail linking each included study to the primary keywords and database in which it was located. Together, these tables operationalise PRISMA requirements for reproducible search reporting and demonstrate how the corpus was derived from the search strings rather than post-hoc selection. The following keywords and their variants were used across the databases:

- Pillar 1 (Introspection): introspective leadership, leader self-awareness, leader self-reflection, mindful leadership, authentic leadership, leader emotional intelligence, leader humility, leader self-regulation, embodied leadership.
- Pillar 2 (Neurobiology): Polyvagal Theory, autonomic nervous system, autonomic regulation, neuroception, ventral vagal, physiological stress, trauma-informed leadership, neuroscience of leadership.
- Pillar 3 (Relational Dynamics): Leader-Member Exchange, LMX, dyadic relationship, psychological safety, leader trust, relational quality, feedback delivery, team cohesion.

Search-String Development and Validation.

- Initial strings combined pillar terms with Boolean operators (e.g., "introspective leadership" OR "leader self-awareness" OR "mindful leadership" "polyvagal" OR

"autonomic regulation" OR "neuroception" OR "ventral vagal" "leader-member exchange" OR "LMX" OR "dyadic trust" OR "psychological safety" OR "feedback").

- Integrative strings were iteratively refined after pilot runs (Web of Science, Scopus) by inspecting top-50 results:
 - ("polyvagal" OR "autonomic regulation") AND ("leader-member exchange" OR "LMX" OR "psychological safety")
 - ("introspective leadership" OR "leader self-awareness" OR mindfulness) AND ("LMX" OR "dyadic" OR "feedback")
 - ("polyvagal" OR neuroception OR "ventral vagal") AND (leadership OR manager*).
- Refinements followed PRISMA 2020 guidance for transparent reporting and Tranfield-style management SLR practice for search iteration and coverage. Concept saturation (no novel concepts in the last 25–30 records per string) was used as a stop rule (Page et al., 2021; Tranfield, Denyer and Smart, 2003).

2.2.3 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Articles explicitly connecting at least two of the three core pillars.
- Studies with populations of leaders, managers, or employees in organisational contexts.
- Peer-reviewed empirical articles, theoretical papers, systematic reviews, and seminal books or book chapters.
- Publications from 1995 to the present, to capture the development of modern LMX theory and the application of PVT to social behaviour.

Exclusion Criteria

- Articles focusing on only one pillar in isolation (e.g., a purely clinical paper on PVT).
- Studies in non-organisational contexts (e.g., parenting, clinical therapy) unless their theoretical contributions were explicitly linked to leadership.

- Non-peer-reviewed sources, editorials, and book reviews.

2.2.4 Search Execution and Final Corpus

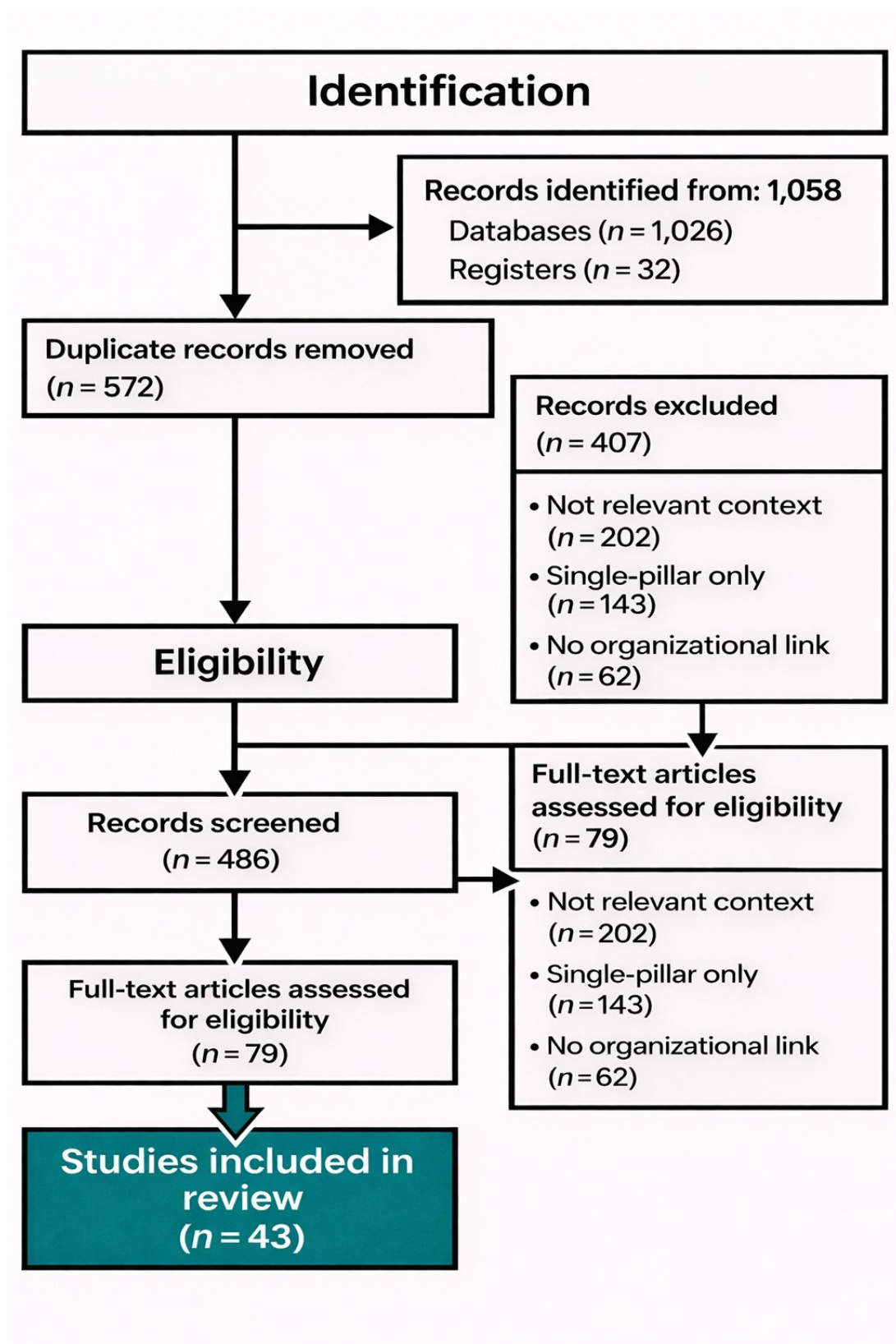


Figure 2: PRISMA Flow Diagram

Literature Selection & Filtering

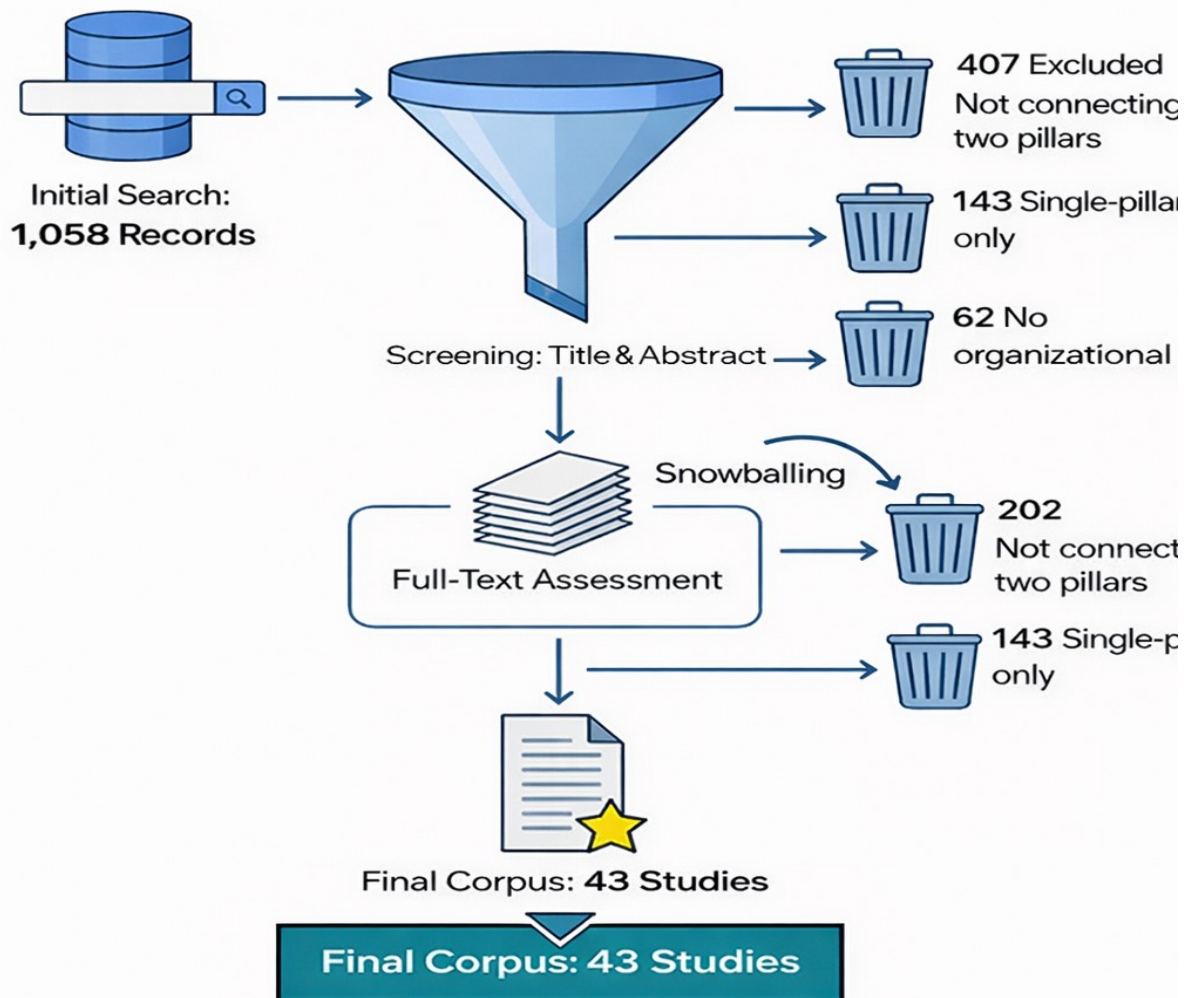


Figure 3: Literature Selection and Filtering

The search was conducted primarily using Google Scholar and Semantic Scholar due to their comprehensive indexing and ability to trace citations across disciplines, supplemented by database searching in Web of Science, Scopus, PsycINFO, and Business Source Complete. The initial search yielded 1,058 records across the four keyword clusters (Table 1). Following de-duplication, titles and abstracts were screened against the inclusion and exclusion criteria, after which full texts were retrieved for eligibility assessment. During full-text screening, eight sources were further excluded because they constituted grey literature or otherwise non-peer-reviewed materials (e.g., practitioner publications, professional white papers, or non-scholarly development materials) and therefore did not meet the study's criterion for scholarly, peer-reviewed evidence. The final screened and eligible set yielded a curated corpus of 43 scholarly sources (peer-reviewed articles and scholarly books/chapters). These works form the evidentiary base for constructing the neuro-relational model proposed in this thesis. Of these 43 sources, 32 were identified directly through database keyword searches and are listed in the Article Identification Audit Trail (Table 2), which records each source's identifying keywords and database location. The remaining 11 sources were incorporated through targeted snowballing, specifically backward citation analysis of the 32 database-retrieved sources; these 11 snowballed sources are all peer-reviewed and meet the inclusion criteria, but were not returned by the initial keyword searches. The complete corpus of all 43 sources, with pillar connections and theoretical contributions, is synthesised in Table 3 (Section 2.8). Screening and reporting procedures followed PRISMA 2020 principles, with decisions documented in the PRISMA flow diagram (Figure 2) and the literature filtering summary (Table 1). Figure 2 depicts the database search branch of the selection process, tracking the 1,058 initial records through to the 32 database-retrieved inclusions. The additional 11 sources identified through snowballing represent a standard PRISMA 2020 supplementary identification pathway and are incorporated into the final corpus of 43 sources documented in Table 3. Eight additional sources identified during screening were excluded at

full-text stage because they were grey literature or did not meet peer-reviewed eligibility requirements; these excluded items were: Hairston (2021), Innovative Human Capital (2024), Zak (2017), Rock (2008), Davidson and Begley (2012), Leroy et al. (2015), Reb et al. (2015), and Kegan and Lahey (2016). These eight items were excluded at the full-text eligibility stage under the ‘grey/non-peer-reviewed’ exclusion code, and are documented as full-text exclusions in the PRISMA breakdown. Although excluded from the formal PRISMA corpus of 43 sources, several of these works are retained in the reference list as contextual background sources that inform the broader scholarly landscape of this thesis. They are not treated as part of the evidentiary base for model construction but provide relevant practitioner and conceptual context where cited in the narrative. This distinction is consistent with standard integrative review practice, which permits supplementary contextual framing beyond the formally screened corpus (Torraco, 2005). Search yield and screening outcomes are summarised in Table 1, while Table 2 provides a study-level audit trail linking included studies to their identifying keywords and source databases. All searches were executed between September and November 2024, with a final update search conducted in February 2025 to capture any newly published sources. Deduplication was performed manually by comparing author names, titles, and DOIs across database exports, yielding a net unique record set before title and abstract screening. Because this thesis is a conceptual integrative synthesis rather than an effectiveness review or meta-analysis, no formal quality appraisal instrument (e.g., CASP, JBI) was applied to included sources. This decision is consistent with guidance on integrative theoretical reviews, where the analytic purpose is to extract and synthesise conceptual contributions rather than to aggregate empirical effect sizes (Torraco, 2005; Tranfield, Denyer and Smart, 2003). The quality and relevance of included sources were instead assessed through the concept-contribution screening criteria described above.

Table 1: Literature Selection and Filtering Matrix

Keyword Cluster	Search Strings	Records Retrieved (Initial Hits)	Records After Screening	Final Studies Included (n)	Pillar Coverage
Introspective / Internal Leadership	“introspective leadership”, “leader self-reflection”, “mindful leadership”, “authentic leadership self-awareness”	312	86	14	P1
Neurobiology / Polyvagal / Regulation	“polyvagal theory leadership”, “autonomic regulation leadership”, “neuroception leadership”, “ANS social engagement”	284	74	12	P2
Relational / LMX / Dyadic Trust	“leader-member exchange”, “LMX trust”, “dyadic leadership relationship”, “psychological safety leadership”	267	71	9	P3
Integrated Pillar Searches (Combined Strings)	(“polyvagal” AND “leadership”), (“introspective leadership” AND “LMX”), (“autonomic regulation” AND “feedback leadership”)	195	48	8	P1 + P2 + P3
Total		1,058	279	43*	Integrated Corpus

* The total of 43 final sources is catalogued in Table 2: 32 were identified through systematic database keyword searching and 11 were incorporated through backward citation analysis (snowballing), both sets now recorded in Table 2. The per-cluster counts above reflect sources identified within each search strand prior to de-duplication; some sources appear across multiple clusters. The complete, de-duplicated synthesis of all 43 sources is presented in Table 3 (Section 2.8). The PRISMA flow diagram (Figure 2) documents the database search branch; the 11 snowballed sources were added following the standard PRISMA 2020 provision for supplementary identification methods.

Table 2: Article Identification Audit Trail (Keywords and Databases)

Author(s) & Year	Article Title (Short)	Primary Keywords Used to Identify	Database Located In	Search String Group
Vanderpal and Brazie (2022c)	HRM recruitment bias study	polyvagal, leadership bias, HRM recruitment	Google Scholar / Scopus	P1+P2+P3 (P1 indirect)
Vanderpal and Brazie (2022a)	Leadership approaches & trauma	leadership trauma, autonomic regulation	Google Scholar	P1+P2
Kolacz et al. (2019)	ACEs and autonomic regulation	ACE, autonomic regulation, social engagement	PsycINFO / Scopus	P2+P3
Porges (2018)	Polyvagal Theory primer	polyvagal theory, neuroception	Web of Science / Google Scholar	P2+P3
Flores and Porges (2017)	Polyvagal group processes	polyvagal, co-regulation, group behaviour	Google Scholar	Integrated
Boss and Sims (2008)	Emotion regulation & recovery	leader emotion regulation, failure recovery	Business Source Complete	P1+P2
Hartung (2020)	Self-awareness leadership	self-awareness leadership, reflective leadership	Google Scholar	P1
Vanderpal and Brazie (2023b)	ANS organisational outcomes	autonomic regulation, organisational outcomes	Google Scholar	P2+P3
Vanderpal and Brazie (2024)	PVT Agile project management	polyvagal agile teams, psychological safety	Google Scholar	P2+P3
Graen and Uhl-Bien (1995)	LMX development theory	leader-member exchange, dyadic leadership	Web of Science / Scopus	P3
Johnson (2023)	Introspective leadership	introspective leadership, reflective leadership	Google Scholar	P1
Avolio and Gardner (2005)	Authentic leadership	authentic leadership, self-awareness	Web of Science	P1+P3
Walumbwa et al. (2011)	Ethical leadership performance	ethical leadership, LMX performance	Scopus	P1+P3
Daudelin (1996)	Reflection experiential learning	reflection learning leadership	Google Scholar	P1
Gustafson et al. (2022)	Active listening leadership	active listening leadership	Google Scholar	P1+P3
Brown and Treviño (2006)	Ethical leadership review	ethical leadership review	Business Source Complete	P1+P3
Alo and Arslan (2022)	Feedback delivery LMX	feedback delivery, LMX	Scopus	P1+P3
Woelfel (2024)	Introspective creativity leadership	introspective leadership creativity	Google Scholar	P1
Dulebohn et al. (2012)	LMX meta-analysis	LMX meta-analysis	Web of Science	P3
Owens and Hekman (2012)	Humble leadership	leader humility leadership	Business Source	P1

			Complete	
Eisenberger (2012)	Social pain neuroscience	social pain neuroscience leadership	PsycINFO	P2+P3
Coan and Sbarra (2015)	Social baseline theory	social baseline theory relationships	PsycINFO	P2+P3
Hostinar et al. (2014)	Social buffering mechanisms	social buffering stress	PsycINFO	P2+P3
Rao et al. (2024)	Neuroscience leadership development	neuroscience leadership development	Google Scholar	P2
Watts (2012)	Introspection executive development	executive introspection leadership	Google Scholar	P1
Tang et al. (2015)	Neuroscience mindfulness	mindfulness neuroscience regulation	PsycINFO	P1+P2
Hölzel et al. (2011)	Mindfulness meditation mechanisms	mindfulness meditation neural	PsycINFO	P1+P2
Farb et al. (2007)	Neural self-reference	self reference neural processing	PsycINFO	P1+P2
Vanderpal and Brazie (2022b)	Investor bias physiology	physiological bias decision making	Google Scholar	P1+P2
Amanchukwu et al. (2015)	Leadership theories review	leadership theories review	Google Scholar	P1
Kamiya (1966)	Ikigai conceptual work	ikigai purpose psychology	Google Scholar	P1
Gardner et al. (2021)	Authentic leadership critique	authentic leadership critique	Scopus	P1
Waldman et al. (2011)	Social cognitive neuroscience	social cognitive neuroscience, leadership, neuroleadership	Web of Science / Scopus	Backward citation
Senior, Lee and Butler (2011)	Organisational cognitive neuroscience	organisational cognitive neuroscience, leadership	Web of Science	Backward citation
Molenberghs et al. (2017)	Neuroscience of inspirational leadership	neuroscience inspirational leadership, neural processing	Scopus / Web of Science	Backward citation
Nembhard and Edmondson (2006)	Leader inclusiveness & psychological safety	leader inclusiveness, psychological safety	Web of Science / Scopus	Backward citation
Edmondson and Lei (2014)	Psychological safety review	psychological safety leadership LMX	Web of Science	Backward citation
Frazier et al. (2017)	Psychological safety meta-analysis	psychological safety meta-analysis leader	Web of Science / PsycINFO	Backward citation
Liang, Farh and Farh (2012)	Promotive & prohibitive voice	psychological safety voice behaviour LMX	Web of Science	Backward citation
Carmeli and Gittell (2009)	High-quality relationships & psychological safety	psychological safety learning failure	PsycINFO / Scopus	Backward citation
Carmeli, Brueller and Dutton (2009)	Learning behaviours & psychological safety	learning behaviours psychological safety	PsycINFO / Scopus	Backward citation
Kark and Carmeli (2009)	Vitality, safety & creative involvement	psychological safety creativity vitality	Web of Science	Backward citation
Gong et al. (2012)	Proactivity, info exchange & safety	psychological safety creativity proactivity LMX	Web of Science / Scopus	Backward citation

2.3 The Rise of Introspective Leadership: A Call for Internal Clarity

For decades, leadership theory has been dominated by models focusing on observable behaviours, traits, and transactional styles (Amanchukwu, Stanley and Ololube, 2015). While valuable, these frameworks often treat the leader as a "black box," overlooking the internal landscape of thoughts, emotions, and physiological states that shape external actions. In response to an increasingly volatile and complex world, a new emphasis on the leader's inner life has emerged. As Hartung (2020) astutely observes, "many answers are not to be found outside but rather inside us" (p. 1). This inward turn has given rise to a family of theories, including authentic, mindful, and ethical leadership, that I group under the umbrella of introspective leadership. A parallel stream has also begun to legitimize "the inner life" of leadership through organisational cognitive neuroscience, arguing that leadership scholarship can be strengthened by integrating neuroscientific methods and neurocognitive explanations rather than relying exclusively on self-report and behavioural observation (Waldman, Balthazard and Peterson, 2011; Senior, Lee and Butler, 2011). This work does not replace introspective leadership; it reinforces the claim that internal states are not theoretical "black boxes," but measurable mechanisms that shape how leaders perceive, regulate, and relate under pressure.

At its core, introspective leadership rests on a leader's commitment to ongoing self-reflection and personal growth as the primary drivers of effectiveness. Johnson (2023, p. 45) defines it as a "cyclical and interdependent process" where reflective practice becomes the key to ethical decision-making, transparency, and trust. This is not a passive state but a dynamic and deliberate practice. Daudelin's (1996) foundational work on learning from experience through reflection established that structured self-examination is a core competency for navigating ambiguity and fostering development. Introspective leaders actively engage in understanding their own values, biases, emotional triggers, and impact on others. This deep self-awareness forms the bedrock of what Avolio and Gardner (2005)

conceptualise as authentic leadership, a construct built on self-awareness, relational transparency, an internalized moral perspective, and balanced processing. Their work empirically links these internal states (Pillar 1) to positive follower outcomes like trust and engagement (Pillar 3).

The practical necessity of this internal work is powerfully articulated by Watts (2012), who argues from decades of executive coaching that a lack of introspection is a primary cause of reactive leadership, poor decision-making, and emotional dysregulation under pressure. This directly addresses this thesis's second research question concerning how introspective practices can mediate the relationship between a leader's internal state and their outward effectiveness. When leaders fail to manage their internal state, they are more susceptible to what Boss and Sims (2008) describe as the paralysis or shame that follows failure, hindering recovery and eroding team trust. An introspective leader, conversely, uses failure as data for reflection, a practice that requires a high degree of emotional regulation and humility (Owens and Hekman, 2012).

Furthermore, introspection is not merely an individual pursuit but is operationalised through specific, teachable skills. Gustafson, Short, and Hamilton (2022) identify active listening as a foundational skill for leaders, requiring them to quiet their own inner dialogue to be fully present with another, an act that is both introspective and relational. Woelfel (2024) extends this by integrating introspection with design-thinking methodologies, using structured identity-mapping and purpose-clarification practices, such as aligning leadership identity with meaning-centred frameworks like *ikigai* (Kamiya, 1966), to help leaders build a coherent and inclusive leadership identity. These frameworks demonstrate that introspection is not an esoteric quality but a designable, deployable capacity for building ethical and effective leadership. However, while this body of literature powerfully advocates for the importance of the leader's inner world, it often treats self-awareness and emotion regulation as primarily cognitive skills. The scholarly record is comparatively thinner on *how* internal

states become interpersonally legible and consequential in real time, particularly through the embodied cues that shape trust, receptivity, and relationship quality. This matters because introspection is not merely private reflection; it is consequential insofar as it alters how leaders show up in dyadic exchanges through tone, attention, responsiveness, and regulation under stress. Within the present author's published programme, this pillar is developed most directly by Vanderpal and Brazie (2022a), which links unresolved stress and trauma to a leader's prevailing leadership approach, and by Brazie and Vanderpal (2023a), which translates reflective self-regulation into concrete leadership practice (see Table 1.1). Accordingly, this thesis turns next to Polyvagal Theory to specify the neurophysiological mechanism that underpins self-regulation and social engagement (Porges, 2018; Kolacz et al., 2019), and then to Leader–Member Exchange theory to locate the relational context in which these regulated or dysregulated states translate into trust, safety, and performance-relevant outcomes (Graen and Uhl-Bien, 1995; Dulebohn et al., 2012).

2.4 The Neurobiology of Safety and Connection: A Polyvagal Perspective

This pivot is also consistent with neuroleadership scholarship showing that biological and neural processes are meaningfully associated with leadership effectiveness and follower responsiveness. For example, developmental stability markers have been linked to leadership effectiveness and group performance (Senior et al., 2011), and fMRI evidence suggests that inspirational leadership cues, especially collective-oriented language from perceived in-group leaders, activate follower neural systems involved in meaning-making and social identity processing (Molenberghs et al., 2017). These findings strengthen the thesis's core premise: leadership is enacted through state-shaped signalling and relational interpretation, not cognition alone. To understand *how* a leader's internal state translates into relational effectiveness, we must move beyond psychology and into physiology. Polyvagal Theory (PVT), developed by Stephen Porges (2018), provides an influential neurobiological framework for understanding the mechanisms of safety, threat, and social connection. PVT

posits that the human autonomic nervous system (ANS) is not a simple two-part system (sympathetic "fight-or-flight" and parasympathetic "rest-and-digest") but a three-part hierarchical system shaped by evolution. This hierarchy directly governs our capacity for social engagement and addresses this thesis's first research question: *How do leaders' neurophysiological states...influence the quality of leader-member exchanges?*

The core concept of PVT is neuroception, a subconscious process by which our nervous system scans the environment (and our interactions) for cues of safety, danger, or life-threat (Porges, 2018). The response to these cues determines our physiological state and, consequently, our behavioural repertoire. The three systems are:

1. The Ventral Vagal Complex (VVC): The most recently evolved circuit, unique to mammals, is associated with the myelinated vagus nerve. When our neuroception detects cues of safety, such as a calm tone of voice, a warm facial expression, or genuine listening, the VVC is activated. This "ventral vagal" state is the neurophysiological substrate for social connection. It calms our heart rate, supports clear cognition, and enables us to feel safe, connected, and engaged. For a leader, being in and co-regulating others into this state is the biological foundation of trust, psychological safety, and high-quality LMX.
2. The Sympathetic Nervous System (SNS): When neuroception detects cues of danger or challenge, the older sympathetic system is activated, leading to the classic "fight-or-flight" response. This state is characterised by mobilisation, increased heart rate, and heightened arousal. While essential for meeting deadlines or facing challenges, chronic sympathetic activation inhibits the social engagement system. A leader operating from this state may appear anxious, reactive, or aggressive, making it difficult to listen, empathize, or build trust.
3. The Dorsal Vagal Complex (DVC): The oldest and most primitive circuit, the unmyelinated dorsal vagus, is activated in response to cues of extreme danger or life-

threat. This leads to a state of shutdown, immobilisation, or dissociation, a "freeze" response. In an organisational context, this can manifest as employee disengagement, learned helplessness, or burnout in response to a chronically threatening or neglectful leader.

It is also important to acknowledge that Polyvagal Theory remains the subject of ongoing scientific debate regarding the strength and interpretation of its empirical base. Critics argue that some of PVT's specific phylogenetic and neuroanatomical claims are difficult to test directly and that several phenomena attributed to distinct vagal pathways may be explainable through broader, well-established autonomic and affective neuroscience frameworks (Beauchaine, 2015; Grossman, 2023). This thesis therefore adopts PVT with methodological caution: it is not treated as a settled, exclusive biological "proof" of leadership mechanisms, but as a generative explanatory framework that organises convergent findings on autonomic regulation, threat responsiveness, and social engagement into a leadership-relevant model. The thesis's claims are anchored not only in PVT-specific sources (e.g., Porges, 2018) but also in adjacent empirical literatures that support the practical core of the argument: physiological state shapes attention, emotional regulation, interpersonal cue processing, and stress responses in ways that plausibly influence feedback exchange and dyadic trust. By positioning PVT as a theoretically productive, integrative lens rather than a definitive biological verdict, the thesis strengthens conceptual defensibility while retaining the framework's value for specifying the embodied conditions under which reflective leadership and relational safety are more or less likely to emerge (Beauchaine, 2015; Grossman, 2023).

To clarify the scope of this dependence, it is useful to distinguish between the model's claims that rely specifically on PVT's contested phylogenetic hierarchy and those that are supported by broader autonomic and affective neuroscience. The core proposition that a leader's physiological state shapes attentional capacity, emotional regulation, and

interpersonal signalling does not depend solely on PVT; it is independently supported by research on heart rate variability and self-regulation (Laborde, Mosley and Thayer, 2017), the social baseline theory of co-regulation (Coan and Sbarra, 2015), and the neuroscience of social pain (Eisenberger, 2012). Similarly, the claim that stress-related physiological arousal impairs reflective access and relational attunement is substantiated by general affective neuroscience, including work on prefrontal-limbic interactions during stress (Arnsten, 2009). PVT's distinctive contribution to the model lies in its specification of a hierarchical autonomic architecture (ventral vagal, sympathetic, dorsal vagal) and the concept of neuroception as a subconscious detection mechanism for safety and threat cues. These specific constructs provide explanatory detail regarding how leaders transmit and followers detect relational safety signals. If future research were to disconfirm PVT's hierarchical specificity, the model's broader architecture linking physiological regulation to relational leadership outcomes would remain viable under alternative autonomic frameworks, while the particular vocabulary of ventral vagal engagement and neuroception would require revision. This layered approach ensures that the neuro-relational model is not wholly contingent upon any single contested theory but draws resilience from its grounding across multiple convergent empirical traditions.

This framework is profoundly relevant to leadership. As argued in my previous work (Vanderpal and Brazie, 2022a), unresolved stress and trauma can lead to a dysregulated ANS, making a leader more likely to operate from a defensive sympathetic or dorsal state. Further exploratory research has established a direct connection between these neurophysiological states and major leadership approaches, demonstrating that a leader's prevailing style is often a reflection of their underlying autonomic condition shaped by stress and trauma (Vanderpal and Brazie, 2022a). Kolacz et al. (2019) provide strong evidence that adverse childhood experiences are linked to autonomic dysregulation, impairing the capacity for healthy relational engagement later in life. This means a leader's ability to be introspective, fair, and

relationally available is not just a matter of will but is constrained or enabled by their own physiological state. An introspective leader, therefore, must be skilled not only in cognitive reflection but in autonomic self-regulation, the ability to recognise and shift their own physiological state back towards the safety of the ventral vagal system. This perspective moves leadership development from a purely cognitive exercise to an embodied, physiological practice grounded in autonomic regulation and social engagement processes (Porges, 2018; Kolacz et al., 2019). Importantly, autonomic regulation does not operate solely at the individual level but shapes interpersonal functioning within relational contexts. Evidence from social neuroscience demonstrates that supportive social relationships buffer physiological stress responses, whereas relational threat activates neural systems associated with distress and withdrawal (Hostinar et al., 2014; Coan and Sbarra, 2015; Eisenberger, 2012). These findings reinforce the premise that leaders' physiological states influence not only their own regulatory capacity but also the relational climate experienced by followers, thereby providing a biological foundation for understanding variability in leader–member exchange quality.

2.5 The Relational Core of Leadership: Leader-Member Exchange (LMX) Theory

While PVT provides the biological substrate, Leader-Member Exchange (LMX) theory offers the most robust relational framework for understanding leadership effectiveness. Developed over decades, LMX theory shifted the focus from leader-centric traits and behaviours to the dyadic, relationship-based nature of leadership (Graen and Uhl-Bien, 1995). The central tenet of LMX is that leaders do not treat all followers uniformly but develop unique exchange relationships with each member of their team. The quality of these dyadic relationships exists on a continuum from low-quality (out-group) to high-quality (in-group).

- Low-quality LMX relationships are transactional and formal, based strictly on the employment contract. Communication is limited, trust is low, and influence is

unidirectional (from leader to member).

- High-quality LMX relationships, conversely, are transformational. They are characterised by high levels of mutual trust, respect, loyalty, and obligation. In these partnerships, there is greater latitude for negotiation, increased social support, and a reciprocal flow of influence (Dulebohn et al., 2012).

Importantly, the development and maintenance of high-quality leader–member exchanges do not occur solely through cognitive or behavioural processes; they are also shaped by the emotional and physiological regulation capacities that leaders bring to interpersonal interactions. At the dyadic level, one of the most practically observable indicators of exchange quality is psychological safety; the shared belief that interpersonal risk-taking for instance speaking up, admitting error, and requesting help will not result in punishment or humiliation. Leader behaviours that invite participation and convey respect are foundational here: leader inclusiveness has been shown to strengthen psychological safety and improvement efforts, especially for lower-status members (Nembhard and Edmondson, 2006). Broader reviews and meta-analytic synthesis confirm psychological safety’s robust antecedents (including leader support and relational trust climates) and its consequential outcomes for learning, information sharing, and performance (Edmondson and Lei, 2014; Frazier et al., 2017). Accordingly, this thesis treats psychological safety as a core relational pathway through which regulated feedback interactions become durable, high-quality LMX. Leaders who maintain regulated affective and attentional states are more likely to communicate predictably, respond empathically, and foster relational stability, all of which support the emergence of trust-based dyadic exchange relationships (Porges, 2018; Hostinar et al., 2014). The implications of LMX quality are vast. A meta-analysis by Dulebohn et al. (2012) confirmed that high-quality LMX is strongly correlated with numerous positive outcomes, including higher job satisfaction, increased organisational commitment, better performance ratings, and lower turnover intentions. This aligns directly with the objectives of

this thesis, as fostering psychological safety and trust-based relationships are key outcomes of high LMX. Crucially, recent scholarship has begun to unpack the specific leader behaviours that foster high-quality LMX, moving closer to the intersection with introspection and physiology. The qualitative study by Alo and Arslan (2022) is particularly salient. They found that supervisory feedback delivery tactics are a powerful antecedent to LMX quality. Feedback perceived as constructive, respectful, and emotionally attuned fostered psychological safety and commitment, whereas feedback perceived as critical or impersonal led to relational strain and diminished morale. This finding is critical because the ability to deliver attuned feedback is contingent on the leader's own internal state. A leader operating from a dysregulated physiological state is more likely to display reactive communication patterns, diminished listening capacity, and reduced emotional attunement, all of which can disrupt the trust-formation processes central to high-quality LMX relationships (Alo and Arslan, 2022; Porges, 2018). This provides a direct, practical link between the leader's internal capacity for regulation (Pillar 1 and 2) and the relational outcomes captured by LMX theory (Pillar 3). Within the present author's published programme, this relational pillar is developed most directly by Vanderpal and Brazie (2023b), which engages Leader-Member Exchange in explaining employee turnover and work culture; by Vanderpal and Brazie (2024), which links co-regulation and psychological safety to team functioning; and by Vanderpal and Brazie (2022c), which traces how a dysregulated state biases dyadic evaluation (see Table 1.1). LMX, therefore, provides the ideal theoretical lens through which to measure the relational impact of a leader's introspective and neurophysiological state. While LMX theory explains how relationship quality emerges and predicts organisational outcomes, it does not fully specify the psychophysiological mechanisms through which leaders' internal regulatory states shape those exchanges. Addressing this limitation requires integrating relational leadership theory with neurobiological and introspective frameworks, a synthesis undertaken in the following section.

Leader–Member Exchange theory is also accompanied by important internal critiques that must be acknowledged for scholarly balance. A central concern is the differentiation problem: because LMX explicitly predicts that leaders form stronger “in-group” exchanges with some members and weaker “out-group” exchanges with others, it can unintentionally legitimize inequity, exclusion, and the uneven distribution of developmental opportunities (Sparrowe and Liden, 2005; Erdogan and Bauer, 2015). Relatedly, LMX has been critiqued for under-theorising power asymmetry, since leaders typically control resources, evaluation, and access, meaning “reciprocity” may be structurally constrained rather than freely negotiated (Erdogan and Bauer, 2015). This thesis treats these critiques as conceptually consequential rather than peripheral: the neuro-relational model argues that dyadic quality cannot be evaluated only by perceived closeness or exchange intensity, but must be assessed against fairness, psychological safety, and inclusion as boundary conditions. In practical terms, the model reframes high-quality exchange as a function of regulated feedback processes that are applied consistently across members, thereby reducing the risk that LMX differentiation becomes a mechanism for favouritism or exclusion. In this way, the thesis adopts LMX for its explanatory value while explicitly guarding against normative misuse by integrating regulation, ethical feedback practice, and inclusion-sensitive interpretation into how “relationship quality” is conceptualised

2.6 Synthesising the Silos: Towards a Neuro-Relational Model of Leadership

The preceding sections have established the individual importance of introspective leadership, Polyvagal Theory, and LMX theory. However, their true explanatory power emerges when they are integrated. The current literature largely treats them as separate domains, leaving a significant theoretical gap. This section synthesises the literature at the intersections of the pillars to build the case for a unified neuro-relational model. The empirical basis for this siloing is visible in the corpus mapping. Figure 6 shows dense coverage within Pillar 1+3 and Pillar 2+3 intersections, but comparatively sparse

representation of sources spanning all three pillars simultaneously. Figure 5 further demonstrates uneven pillar coverage by category, indicating that physiological regulation is more commonly treated as a supporting lens rather than a co-equal construct within introspective leadership theory. These distribution patterns justify the need for an integrated neuro-relational model rather than incremental bridging arguments.

2.6.1 The Established Link: Introspection and LMX (Pillar 1 + Pillar 3)

The connection between introspective leadership styles and LMX is the most established of the three intersections. A large body of work has demonstrated that who a leader *is* on the inside directly impacts the quality of their relationships. The framework of authentic leadership's emphasis on self-awareness and relational transparency aligns with dyadic exchange quality and the development of high-quality leader–member relationships (Avolio and Gardner, 2005; Dulebohn et al., 2012). When leaders are genuine and behave in alignment with their values, followers perceive them as more trustworthy and are more willing to engage in the reciprocal exchanges that characterise in-group relationships.

Similarly, ethical leadership, which requires deep moral reflection (Pillar 1), is strongly linked to LMX. Brown and Treviño (2006) argue that ethical leaders build trust and respect, core components of high LMX. Walumbwa et al. (2011) provided empirical evidence for this, showing that LMX mediates the relationship between ethical leadership and employee performance. The logic is clear: leaders who are introspective enough to act with integrity and fairness are more likely to cultivate high-quality dyadic relationships. Furthermore, research on leader humility (Owens and Hekman, 2012) and mindfulness reinforces this connection. Mindfulness and reflective practices may support less reactive leadership by strengthening self-regulatory capacity, which is theoretically consistent with dyadic relationship quality and psychological safety (Tang et al., 2015; Hölzel et al., 2011; Dulebohn et al., 2012). Humble leaders, who are self-aware of their limitations, and mindful leaders, who are more present and less reactive, are better equipped to foster the

psychological safety and mutual respect that LMX theory describes. However, while this link is well-documented, the *mechanism* is often assumed rather than explicated. The literature describes a correlation but rarely delves into the embodied, physiological processes that mediate this connection. It answers *what* introspective leaders do to build LMX but falls short of explaining *how* their internal state is biologically transmitted to and received by a follower.

2.6.2 The Missing Mechanism: Neurobiology and Relational Dynamics (Pillar 2 + Pillar 3)

This is where integrating Polyvagal Theory becomes transformative. PVT provides the missing neurobiological mechanism to explain *how* LMX is formed and maintained. The "trust," "respect," and "safety" central to LMX are not merely psychological appraisals; they are physiological states. When a leader's actions are neurocepted as safe, the follower's ventral vagal system is engaged, making them biologically capable of connection. From a neuro-relational perspective, trust and safety in leader–member exchanges are not only cognitive appraisals but are also reflected in physiological readiness for connection. Supportive dyadic relationships can buffer stress responses and reduce threat reactivity, whereas relational instability can heighten physiological stress and withdrawal responses (Hostinar et al., 2014; Coan and Sbarra, 2015; Eisenberger, 2012).

Conversely, the experience of a low-quality LMX relationship, characterised by distrust, unpredictability, and transactional distance, can be understood as a chronic source of physiological threat. This aligns with Eisenberger's (2012) research showing that social pain activates the same neural regions as physical pain. From a PVT perspective, a follower in a low-quality LMX relationship with a critical or neglectful leader is likely operating from a defensive state of sympathetic arousal or dorsal shutdown. In such a state, their capacity for the creativity, collaboration, and engagement that organisations desire is substantially diminished. The consequences of this physiological state extend beyond the individual, impacting the entire organisation; recent work has shown that a leader's ability to maintain a regulated autonomic state is linked to improved organisational performance through tangible

outcomes like reduced employee turnover and a healthier work culture (Vanderpal and Brazie, 2023b). Evidence further indicates that perceived relational threat activates neural systems associated with distress and withdrawal, reducing engagement and cooperative behaviour (Eisenberger, 2012).

This integration directly addresses this thesis's first research question and first objective. It also clarifies why psychological safety is not merely an affective climate variable but a mechanism that predicts adaptive organisational behaviour. Two-wave evidence indicates that psychological safety supports both promotive and prohibitive voice, enabling employees to suggest improvements and to surface risks without fear of interpersonal penalty (Liang, Farh and Farh, 2012). Longitudinal and process-oriented studies further show that high-quality relationships support psychological safety, which in turn predicts learning behaviours and adaptive performance (Carmeli, Brueller and Dutton, 2009). Psychological safety also supports creative work involvement through vitality and aliveness (Kark and Carmeli, 2009), and it enables proactive creativity by facilitating information exchange and reducing interpersonal risk in idea generation (Gong et al., 2012). These outcomes specify the “why” of the neuro-relational model: regulation enables safety, safety enables voice and learning, and those behaviours translate into performance-relevant organisational outcomes. The quality of a leader-member exchange is directly influenced by the neurophysiological states of both parties. A leader’s ability to deliver attuned feedback, for example, is dependent on their capacity to remain in a ventral vagal state while doing so. If the leader is in a sympathetic state (e.g., anxious about the conversation), their tone, posture, and pacing will subconsciously transmit cues of danger, likely triggering a defensive state in the follower, thereby undermining the feedback's intent and damaging the LMX relationship.

2.6.3 The Leader’s Intervention: Introspection as Neurobiological Regulation (Pillar 1 + Pillar 2)

If PVT provides the mechanism for relational quality, then introspective practices

provide the primary intervention for the leader to manage that mechanism. This synthesis addresses the second research question: *How can introspective leadership practices mediate the relationship between autonomic regulation and inclusive, trust-centred leadership outcomes?* The answer is that introspection is a form of applied neurobiology. Converging evidence from neuroscience of mindfulness indicates that reflective practices are associated with changes in neural systems linked to attention, self-referential processing, and emotion regulation, supporting greater self-regulatory capacity under stress (Tang et al., 2015; Hölzel et al., 2011; Farb et al., 2007). They strengthen neural circuits in the prefrontal cortex associated with executive function, emotional regulation, and self-awareness, while reducing the reactivity of the amygdala, the brain's threat-detection centre. In PVT terms, these practices increase "vagal tone," enhancing the efficiency of the ventral vagal system. This allows a leader to more effectively regulate their own autonomic state, to notice when they are moving into a defensive state and consciously guide themselves back to a state of safety and social engagement.

This is the essence of introspective leadership in a neuro-relational model. It is the capacity to use self-awareness (Pillar 1) to regulate one's own physiology (Pillar 2), which in turn enables one to show up in relationships in a way that fosters safety, trust, and connection (Pillar 3). As Watts (2012) suggests, the power of introspection is its ability to build resilience and prevent emotional dysregulation under stress. This perspective recasts leadership development not as the accumulation of new behaviours, but as the cultivation of a more regulated and integrated nervous system.

This transition from theoretical synthesis to practical application is explicitly detailed in the author's comprehensive guide, *Steadfast Leader* (Brazie and Vanderpal, 2023a). The book operationalises the principles of autonomic self-regulation (Pillar 2) by providing leaders with frameworks to control anxiety and recognise their own physiological states, thereby enabling a shift from defensive sympathetic activation to a state of ventral vagal

safety and social engagement. By grounding leadership in this regulated internal state, the work provides a direct pathway for enhancing the quality of Leader-Member Exchange (Pillar 3), arguing that a leader's ability to make confident decisions and focus their team is contingent upon their own neurobiological stability. As such, the book serves as an extended application of the neuro-relational model, demonstrating how the introspective capacities (Pillar 1) discussed in the literature can be systematically developed to produce resilient and relationally attuned leaders. Taken together, these findings suggest that leadership effectiveness can be conceptualised as a multi-level regulatory process in which introspective awareness enables autonomic regulation, autonomic regulation shapes relational signalling, and relational signalling ultimately determines the quality of leader-member exchange relationships that drive organisational outcomes.

2.7 Identification of the Theoretical Gap and Contribution of the Present Thesis

The systematic review of the 43 peer-reviewed sources included in this study reveals three highly developed but only partially integrated domains of scholarship: (1) introspective and self-reflective leadership approaches, (2) neurobiological frameworks of autonomic regulation and social engagement, and (3) relational leadership perspectives, particularly Leader-Member Exchange (LMX) theory. While each domain independently demonstrates strong explanatory power, the reviewed literature indicates that empirical and theoretical integration across all three remains limited. Existing studies frequently connect introspective leadership to relational outcomes or examine neurobiological regulation in social functioning; however, few studies simultaneously explain how leaders' internal regulatory states translate into relational leadership processes through identifiable physiological mechanisms. This is evidenced both procedurally (Tables 1–2 demonstrate systematic selection rather than convenience sampling) and substantively (Figures 5–6 reveal limited three-pillar convergence across the included corpus).

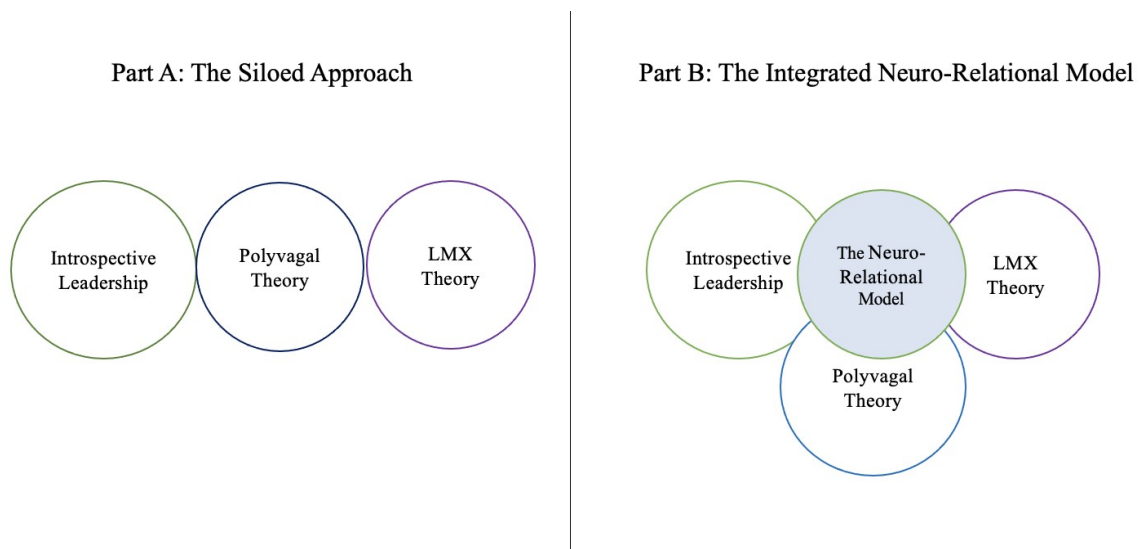


Figure 4: Theoretical Gap and Integration

The theoretical gap lies at the intersection of all three. While some research connects introspection to LMX, it lacks a deep physiological explanation. While applications of PVT to therapy and conflict are growing, its integration into mainstream leadership theory, particularly LMX, is nascent. This gap is one that the present author's own publications repeatedly approached from different vantage points but never unified: each applied Polyvagal Theory to a single domain, whether leadership style, financial and recruitment bias, employee turnover, or team co-regulation, without consolidating these strands into one relational model (see Table 1.1). The present thesis is positioned to bridge this gap by proposing a unified neuro-relational model of introspective leadership. This model argues that effective leadership is an embodied, psychophysiological process. Introspection is not just thinking; it is the act of attuning to one's own autonomic state. Relational quality is not just a social preference; it is a biological state of safety and co-regulation. By integrating these previously parallel streams of research, the present thesis contributes to leadership scholarship in three principal ways. First, it advances an evidence-informed theoretical mechanism linking leader introspection, autonomic regulation, and dyadic exchange quality, thereby moving beyond behavioural correlation models towards a neuro-relational explanatory framework. Second, it reconceptualises leadership effectiveness as an embodied

regulatory capacity, positioning leaders' physiological self-regulation as a foundational process shaping psychological safety, trust formation, and relational stability within teams. Third, it proposes a theoretically grounded developmental framework suggesting that leadership development interventions aimed at strengthening reflective awareness and autonomic self-regulation may enhance relational leadership outcomes, thereby extending existing leadership models that emphasise behavioural competencies alone. Ultimately, by weaving together these three threads, this thesis will provide a richer, more comprehensive understanding of how leaders can effectively navigate the internal and external challenges of the modern world, not just through what they do, but through who they are at a physiological level.

2.8 Tabular Summary of Reviewed Literature

The following table provides a comprehensive summary of all 43 scholarly sources that constitute the evidentiary corpus of this thesis. This total comprises 32 sources identified through the systematic database search described in Section 2.2, and 11 additional sources incorporated through targeted snowballing from reference lists and forward citation tracking. The 11 snowballed sources are predominantly psychological safety, LMX, and neuroleadership studies that were not returned by the initial keyword searches but were identified as foundational through backward citation analysis of the primary corpus. Each entry details the source's core contribution and the theoretical pillars it connects, serving as a reference guide to the full foundational literature.

Table 3: Summary of Key Literature

Author(s) & Year	Title / Source	Pillars Connected	Key Contribution
Vanderpal and Brazie (2022c)	HRM recruitment bias study	P1+P2+P3 (P1 indirect)	Links stress/trauma physiology to leadership decision bias
Vanderpal and Brazie (2022a)	Leadership approaches & trauma	P1+P2	Shows physiological regulation shapes leadership style
Kolacz et al. (2019)	ACEs and autonomic regulation	P2+P3	Demonstrates ANS dysregulation impacts relational functioning
Porges (2018)	Polyvagal Theory primer	P2+P3	Foundational neurophysiology of safety and connection
Flores and Porges (2017)	Polyvagal group processes chapter	P1+P2+P3	Demonstrates co-regulation in relational contexts
Boss and Sims (2008)	Emotion regulation & recovery	P1+P2	Emotional regulation supports leader resilience
Hartung (2020)	Self-awareness & leadership behaviour	P1+P3	Internal awareness improves relational leadership outcomes
Vanderpal and Brazie (2023b)	ANS impact on organisational outcomes	P2+P3	Autonomic regulation linked to turnover and culture
Vanderpal and Brazie (2024)	PVT and Agile project management	P2+P3	Applies PVT to psychological safety in teams
Graen and Uhl-Bien (1995)	LMX development theory	P3	Foundational dyadic leadership framework
Johnson (2023)	Introspective leadership reflection	P1+P3	Defines introspection as relational leadership mechanism
Avolio and Gardner (2005)	Authentic leadership development	P1+P3	Self-awareness drives trust and engagement
Walumbwa et al. (2011)	Ethical leadership and performance	P1+P3	LMX mediates ethical leadership outcomes
Daudelin (1996)	Reflection and experiential learning	P1	Establishes reflection as leadership learning process
Gustafson et al. (2022)	Active listening leadership skill	P1+P3	Listening enhances relational trust
Brown and Treviño (2006)	Ethical leadership review	P1+P3	Moral reflection fosters trust-based leadership
Alo and Arslan (2022)	Feedback delivery and LMX	P1+P3	Feedback style predicts relationship quality

Woelfel (2024)	Introspective creativity leadership	P1+P3	Operationalizes introspection tools
Dulebohn et al. (2012)	LMX meta-analysis	P1+P3	Identifies predictors and outcomes of LMX
Owens and Hekman (2012)	Humble leadership behaviours	P1+P3	Leader humility improves team performance
Eisenberger (2012)	Social pain neuroscience	P2+P3	Social rejection activates neural threat responses
Coan and Sbarra (2015)	Social baseline theory	P2+P3	Relationships regulate physiological stress
Hostinar et al. (2014)	Social buffering mechanisms	P2+P3	Supportive relationships reduce stress reactivity
Rao et al. (2024)	Neuroscience in leadership development	P2+P3	Expands neuroscience-leadership integration
Watts (2012)	Introspection in executive development	P1+P2	Reflection enhances emotional regulation
Tang et al. (2015)	Neuroscience of mindfulness	P1+P2	Mindfulness improves regulatory neural systems
Hölzel et al. (2011)	Mechanisms of mindfulness meditation	P1+P2	Explains neurobiological regulation pathways
Farb et al. (2007)	Neural modes of self-reference	P1+P2	Demonstrates neural basis of self-awareness
Vanderpal and Brazie (2022b)	Investor bias physiology	P1+P2 (P1 indirect)	Shows physiological states influence cognition
Amanchukwu et al. (2015)	Leadership theories review	P1	Contextualizes traditional leadership frameworks
Kamiya (1966)	Ikigai conceptual work	P1	Foundational introspective purpose framework
Gardner et al. (2021)	Authentic leadership critique	P1	Critical evaluation of leadership authenticity theory
Waldman et al. (2011)	Leadership and Neuroscience (neuroleadership)	P1+P2+P3	Argues for integrating neuroscience (EEG/fMRI) into leadership identification and development
Lee et al. (2011)	Leadership research & cognitive neuroscience	P1+P2	Positions organisational cognitive neuroscience as a bridge between internal processes and leadership outcomes
Senior et al. (2011)	Developmental stability & leadership effectiveness	P2+P3	Links biological stability markers to leadership effectiveness and group performance

Molenberghs et al. (2017)	Neuroscience of inspirational leadership	P2+P3	Shows collective-oriented language/in-group cues shape follower neural processing and responsiveness
Nembhard and Edmondson (2006)	Leader inclusiveness & psychological safety	P3	Demonstrates leader inclusiveness increases psychological safety and improvement efforts
Edmondson and Lei (2014)	Psychological safety review	P3	Synthesises psychological safety theory, measurement, antecedents, and outcomes
Frazier et al. (2017)	Psychological safety meta-analysis	P3	Meta-analytic evidence for antecedents/outcomes of psychological safety across levels
Liang et al. (2012)	Promotive & prohibitive voice	P3	Shows psychological safety predicts voice behaviours (especially prohibitive voice)
Carmeli et al. (2009)	Learning behaviours & psychological safety	P3	High-quality relationships → psychological safety → learning behaviours
Kark and Carmeli (2009)	Vitality, safety & creative involvement	P3	Psychological safety fosters creativity via vitality/aliveness
Gong et al. (2012)	Proactivity, info exchange & safety	P3	Psychological safety supports proactive creativity through information exchange

Figure 5: Heatmap of Pillar Coverage by Category (n = 43 Sources)

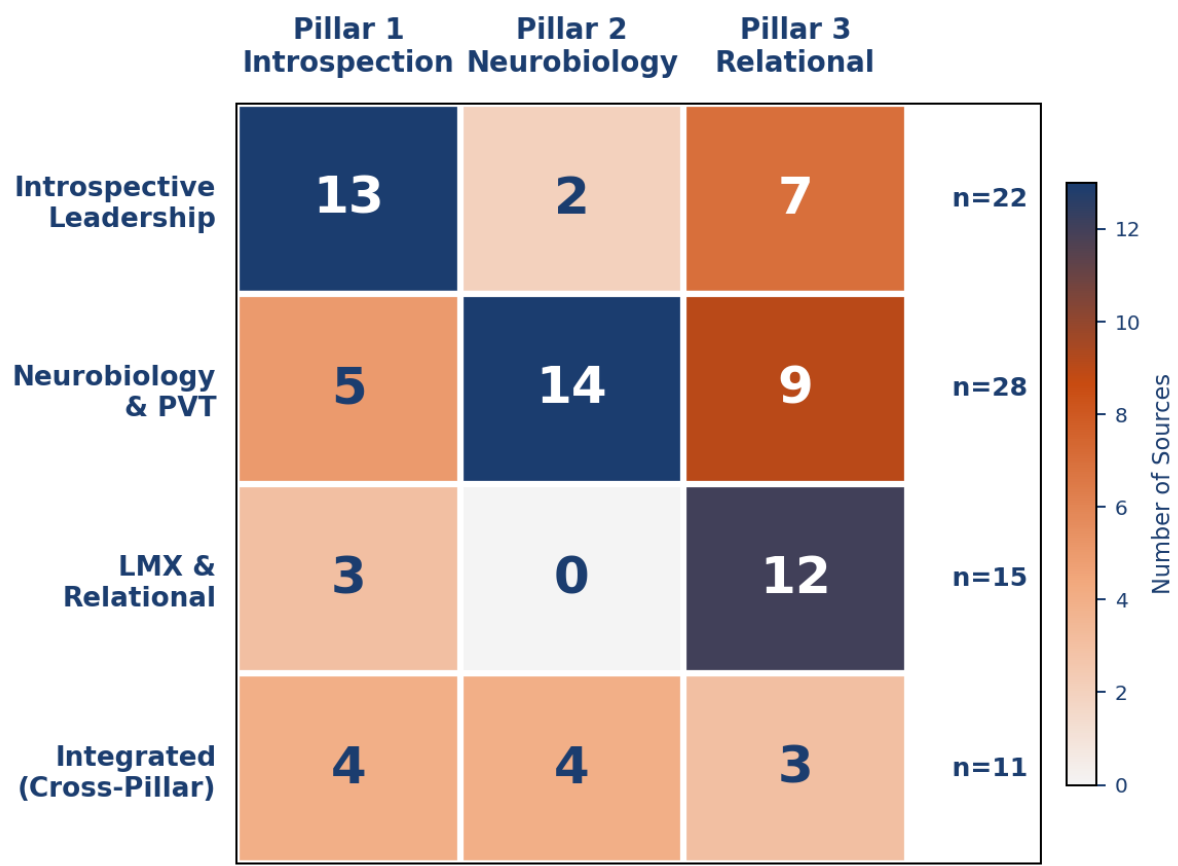


Figure 5: Heatmap of Pillar Coverage by Category

Figure 6: Sources vs Pillars Heatmap (n = 43 Sources)

	Pillar 1 Introspective Leadership	Pillar 2 Neurobiology & PVT	Pillar 3 LMX & Relational	
Flores & Porges (2017)	✓	✓	✓	P1+P2+P3 (n=3)
Vanderpal & Brazie (2022c)	✓	✓	✓	
Waldman et al. (2011)	✓	✓	✓	
Boss & Sims (2008)	✓	✓		P1+P2 (n=8)
Farb et al. (2007)	✓	✓		
Hölzel et al. (2011)	✓	✓		
Senior, Lee & Butler (2011)	✓	✓		
Tang et al. (2015)	✓	✓		
Vanderpal & Brazie (2022a)	✓	✓		
Vanderpal & Brazie (2022b)	✓	✓		
Watts (2012)	✓	✓		
Alo & Arslan (2022)	✓		✓	P1+P3 (n=10)
Avolio & Gardner (2005)	✓		✓	
Brown & Treviño (2006)	✓		✓	
Dulebohn et al. (2012)	✓		✓	
Gustafson et al. (2022)	✓		✓	
Hartung (2020)	✓		✓	
Johnson (2023)	✓		✓	
Owens & Hekman (2012)	✓		✓	
Walumbwa et al. (2011)	✓		✓	
Woelfel (2024)	✓		✓	
Coan & Sbarra (2015)		✓	✓	P2+P3 (n=9)
Eisenberger (2012)		✓	✓	
Hostinar et al. (2014)		✓	✓	
Kolacz et al. (2019)		✓	✓	
Molenberghs et al. (2017)		✓	✓	
Porges (2018)		✓	✓	
Rao et al. (2024)		✓	✓	
Vanderpal & Brazie (2023a)		✓	✓	
Vanderpal & Brazie (2024)		✓	✓	
Amanchukwu et al. (2015)	✓			P1 only (n=4)
Daudelin (1996)	✓			
Gardner et al. (2021)	✓			
Kamiya (1966)	✓			
Carmeli & Gittell (2009)			✓	P3 only (n=9)
Carmeli, Brueller & Dutton (2009)			✓	
Edmondson & Lei (2014)			✓	
Frazier et al. (2017)			✓	
Gong et al. (2012)			✓	
Graen & Uhl-Bien (1995)			✓	
Kark & Carmeli (2009)			✓	
Liang et al. (2012)			✓	
Nembhard & Edmondson (2006)			✓	

Figure 6: Sources vs Pillars Heatmap

Figures 5 and 6 provide a visual summary of how the 43 sources within the final corpus distribute across the three theoretical pillars. Figure 5 presents a heatmap of pillar coverage organised by thematic category, illustrating that the majority of sources address one

or two pillars in combination but that coverage across all three pillars simultaneously remains sparse. This visual pattern substantiates the thesis's central claim that the fields of introspective leadership, Polyvagal Theory, and Leader–Member Exchange theory have evolved in relative isolation. Figure 6 maps individual sources against their pillar affiliations, showing dense clustering at the Pillar 1+3 (introspection–LMX) and Pillar 2+3 (neurobiology–LMX) intersections but limited representation at the full three-pillar convergence point. Together, these heatmaps provide empirical justification from the corpus for the integrative gap that the neuro-relational model is designed to address: while substantial two-pillar bridging exists, no prior work has proposed a unified framework that systematically links all three theoretical domains into a single explanatory architecture.

2.9 Chapter Summary

This chapter has systematically reviewed the three theoretical pillars that underpin the neuro-relational model. It has shown that introspective leadership theory, Polyvagal Theory, and Leader-Member Exchange theory each offer partial explanations of leadership effectiveness, but that no prior work has integrated them into a unified framework. The review has demonstrated that the gap is not merely conceptual but consequential: without specifying the neurobiological mechanism through which a leader's internal state shapes relational outcomes, the field cannot explain the observed disconnect between leaders' intentions and their relational impact. This gap directly motivates the methodological approach developed in Chapter 3, which employs a commentary-based synthesis to construct an integrative framework. The tabular summary in Section 2.8 provides a consolidated reference for the 43 sources that constitute the evidentiary corpus upon which that synthesis is built.

Chapter 3: Methodology and Framework for Theoretical Integration

3.1 Introduction: Charting a Path for Model Development

This chapter sets out the methodological architecture through which the neuro-relational model of introspective leadership is constructed. Having established in the preceding chapters the theoretical problem and the literature underpinning its three pillars, this chapter now explains how those foundations are integrated into a coherent theoretical framework. This is fundamentally an act of theory-building rather than theory-testing. As established in the preceding chapters, the fields of introspective leadership, neurobiology, and relational dynamics have largely evolved in separate, siloed streams of inquiry. While each offers profound insights, their true explanatory power remains constrained by the absence of a unifying framework that can account for the dynamic interplay between a leader's internal state, physiological regulation, and interpersonal effectiveness. To achieve the thesis's aim, this research employs a non-empirical, commentary-based synthesis as its core methodology. This approach is deliberately chosen as the most appropriate and rigorous means to bridge the significant conceptual divides identified in the literature. Significant theoretical integration must precede meaningful empirical investigation. This thesis undertakes that prior work. Before the complex interplay of autonomic states and relational quality can be effectively measured, it must first be conceptually defined, mapped, and understood. This thesis undertakes that foundational conceptual work. The commentary-based synthesis provides a structured method for the systematic analysis and integration of existing theoretical frameworks, including the author's own prior published research, to construct a novel, coherent, and generative model.

To justify this choice, it is worth pausing to consider the alternatives. A conventional systematic review with meta-analytic synthesis would be inappropriate here because the three theoretical frameworks this thesis integrates (introspective leadership, Polyvagal Theory, and LMX) have not been studied together in primary empirical research; there are no studies

whose findings can be statistically aggregated across all three domains. A purely narrative review would lack the structural rigour required to claim that the integration is principled rather than selective. A grounded theory approach would require primary data collection, which is neither appropriate nor necessary for a theory-building project based on existing scholarship. The commentary-based synthesis, informed by PRISMA screening protocols and GIOIA-based analytical procedures, occupies the methodological space that these alternatives cannot: it is systematic in its literature selection, principled in its analytical moves, and appropriate to the epistemological task of constructing theoretical frameworks from existing conceptual and empirical work. This methodological choice is consistent with established practice in theory-building scholarship (Torraco, 2005; Tranfield, Denyer and Smart, 2003; Jabareen, 2009).

A further consideration concerns the architecture of the commentary itself. A PhD by prior publication does not sit comfortably within the conventional thesis structure, because the original contribution is distributed across a collection of already published works rather than concentrated in a single empirical study. The structure adopted here retains the familiar sequence of introduction, literature review, methodology, synthesis, and conclusion, but reorganises its internal logic around the three pillars of the neuro-relational model. Each pillar is introduced through the published literature, developed through the relevant works in the author's own collection, and then drawn together in the synthesis of Chapter 2 and the contributions of Chapter 4, with Table 1.1 making this mapping explicit. This arrangement was chosen deliberately, in preference to a chapter-per-publication format, because the contribution of the collection is cumulative and integrative rather than additive: the value of the works lies in what they jointly establish about the relationship between autonomic regulation and relational leadership, which a publication-by-publication structure would fragment.

To recall: this thesis addresses two research questions. RQ1 asks how leaders' neurophysiological states, as explained by Polyvagal Theory, influence the quality of leader-member exchange. RQ2 asks how introspective leadership practices mediate the relationship between autonomic regulation and trust-centred outcomes. The methodology described in this chapter, a commentary-based synthesis guided by PRISMA screening and a GIOIA-informed analytical approach, is the method through which the literature assembled in Chapter 2 is integrated to produce the neuro-relational model that answers both questions.

To enhance rigour, this thesis adapts core principles from the Gioia methodology (Gioia, Corley and Hamilton, 2013) for inductive concept development and theory articulation in interpretive research. To strengthen methodological precedent for this adaptation, the thesis positions its Gioia-informed logic within established guidance on conceptual synthesis and framework construction from textual sources. Torraco's (2005) approach to integrative literature reviews emphasises theory development through disciplined conceptual organisation and synthesis of prior scholarship rather than primary field data, which aligns with the present study's use of published texts as analytic material. Similarly, Jabareen (2009) outlines a systematic procedure for building conceptual frameworks through iterative identification, categorisation, and integration of concepts across literature streams, providing a recognised foundation for applying structured, Gioia-style coding logic to non-interview evidence. Together, these precedents clarify that the thesis is not claiming a verbatim replication of the Gioia method, but a defensible adaptation of its coding architecture to theory-building from scholarly texts (Torraco, 2005; Jabareen, 2009). To be unambiguous: this thesis does not perform inductive coding from raw empirical data such as interview transcripts. Instead, the Gioia framework is adapted as an organising theoretical abstraction model for structuring concepts extracted from published scholarly texts into a hierarchical data structure that supports transparent theory articulation. Although not empirical in nature (i.e. not based on interview transcripts), the process mirrors the logic of

first-order/second-order coding and data-structure building, applied to textual theory “data.”

Specifically:

1. First-order “concepts” are derived from the original language of the texts (e.g. key theory statements, terms, metaphors) related to introspection, autonomic state, feedback, and relational quality.
2. Second-order themes arise through researcher interpretation, grouping first-order concepts into higher-level constructs that cross disciplines (e.g. “neuroceptive attunement,” “relational calibration,” “introspective regulation”).

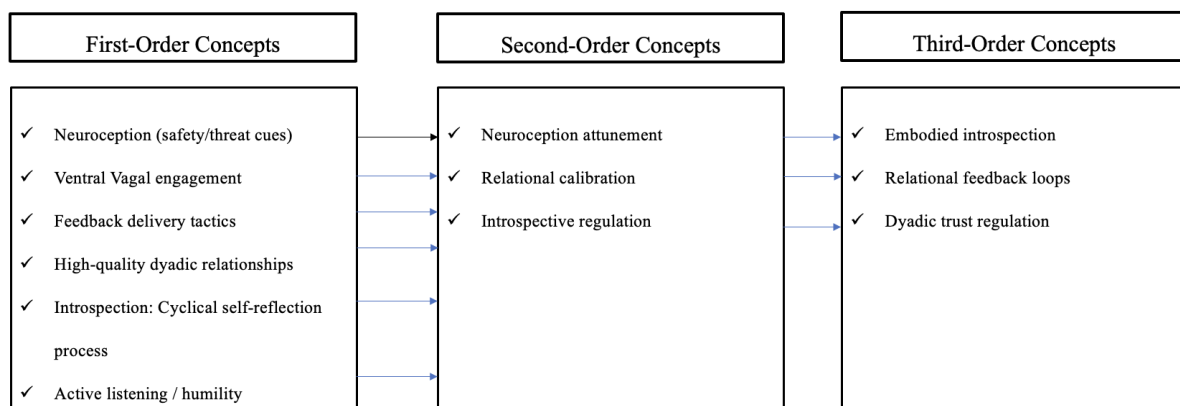


Figure 7: Gioia Data Structure for the Neuro-Relational Model

3. Aggregate dimensions represent the macro-level theoretical blocks of the neuro-relational model (e.g. “embodied introspection,” “relational feedback loops,” “dyadic trust regulation”).

First-order Concepts	Second-order Themes (researcher-centric)	Aggregate Dimensions
Neuroception (safety/threat cues)	Neuroceptive attunement	Embodied introspection
Ventral vagal engagement	Introspective regulation	Embodied introspection
Feedback delivery tactics	Relational calibration	Relational feedback loops
High-quality dyadic relationships; psychological safety	Relational calibration	Relational feedback loops
Introspection as a cyclical self-reflection process	Introspective regulation	Embodied introspection
Active listening / humility	Relational calibration	Dyadic trust regulation
(Linking VVC ↔ psychological safety)	Neuroceptive attunement	Dyadic trust regulation

Table 4: Gioia Data Structure: First-Order Concepts, Second-Order Themes, and Aggregate Dimensions

This chapter provides a detailed account of and justification of this methodological approach. It begins by articulating the philosophical foundations that underpin the research, establishing the core assumptions about the nature of leadership that necessitate a non-empirical strategy. It then offers a precise definition of the commentary-based synthesis, distinguishing it from other forms of scholarly review and highlighting its unique suitability for theory development. Subsequently, the chapter delineates the corpus of analysis, the specific textual "data" upon which the synthesis is built and describes the systematic process of analysis and integration used to construct the neuro-relational model. Finally, the chapter outlines the specific criteria for ensuring methodological rigour and trustworthiness in a conceptual study, directly addressing potential critiques regarding the absence of new empirical data.

3.2 Philosophical Foundations of the Research

The methodological approach of this thesis is a direct and necessary consequence of its core philosophical commitments regarding the nature of leadership. The research is predicated on the explicit assumption that leadership is fundamentally an embodied, psychophysiological, and relational system. This ontological stance represents a deliberate departure from conventional, behaviourist models of leadership that have historically dominated the field. Such models, while valuable, often treat the leader as a "black box," focusing on observable behaviours and external outcomes while isolating cognition from embodiment and relationship from neurobiological context (Amanchukwu, Stanley and Ololube, 2015). They frequently overlook the internal neurophysiological and interpersonal processes that are not merely incidental to leadership but are, in fact, the very substrate from which moment-to-moment leadership emerges. By positing leadership as an embodied and systemic phenomenon, this thesis aligns with an interpretivist or constructivist research

paradigm. Consistent with a constructivist–interpretivist orientation, the thesis treats leadership reality as multiple, socially situated, and constituted through meaning-making and interaction rather than as a single objective entity that can be fully captured through detached measurement (Crotty, 1998; Guba and Lincoln, 1994). Epistemologically, the thesis assumes that knowledge about leadership emerges through interpretive, theory-building synthesis, and is warranted through coherence of argument, transparency of reasoning, and alignment between philosophical assumptions and analytic choices rather than through prediction or statistical generalisation (Crotty, 1998; Guba and Lincoln, 1994). These commitments are essential for the present inquiry because they legitimize a mechanism-focused, integrative account of how embodied regulation and dyadic trust co-produce leadership outcomes within specific organisational contexts. This paradigm acknowledges the profound complexity and interplay of subjective internal states (e.g., a leader's felt sense of safety or threat), intersubjective relational dynamics (e.g., the co-regulation of a dyad), and observable external behaviours (e.g., the delivery of feedback). It assumes that these elements are not linearly related but are mutually constituted in a continuous feedback loop.

An important clarification of scope is warranted here. This model does not advance a biologically determinist account of leadership, nor does it propose a reductionist neuroscience that reduces leadership effectiveness to physiology alone. Rather, the neuro-relational framework is conceived as a multi-level integration in which physiological, cognitive, and relational processes are mutually constitutive. Autonomic regulation is positioned as one foundational layer within a broader system that includes reflective cognition, social learning, and dyadic interaction. The model therefore seeks to complement, not replace, existing cognitive and behavioural accounts of leadership by specifying the embodied conditions under which those processes operate more or less effectively.

This philosophical commitment makes the choice of a non-empirical methodology a matter of necessity, not convenience. Methodologies rooted in a purely positivist tradition,

such as controlled experiments or large-scale surveys, are designed to excel at isolating discrete variables to test linear, cause-and-effect relationships. While indispensable for theory-testing, they are fundamentally ill-suited for the nascent stages of theory-building when the phenomenon of interest is a holistic, dynamic, and non-linear system. Attempting to measure the "effect" of a leader's ventral vagal state on LMX quality without first having a robust conceptual model that explains *how* and *why* they are connected would be premature and methodologically misaligned. The research questions of this thesis, which focus on exploring influence, mediation, and integration, demand a method capable of operating at a conceptual level. A commentary-based synthesis provides precisely such a method, allowing for the intricate weaving together of neurobiology, psychology, and relational science in a manner that an empirical study, at this early stage of model development, could not achieve. The methodology is thus philosophically determined by the nature of the reality it seeks to understand. To operationalise this interpretivist stance in the context of theory-building, this thesis draws on inductive and abductive logic rather than purely deductive logic. The abductive move enables integrating insights from existing theories (PVT, LMX, introspective leadership) with emergent conceptual patterns from the literature corpus. This hybrid logic guards against forcing the model to fit prior assumptions and instead allows new theoretical insights to emerge while being anchored in established scholarship.

Further, the philosophical orientation of this thesis is grounded in a constructivist–interpretivist ontological position, which assumes that leadership phenomena are not fixed, universally observable entities but socially enacted processes that emerge through relational interaction, subjective interpretation, and embodied experience. Within this ontological view, leadership effectiveness is understood as a dynamic and context-dependent phenomenon shaped by interpersonal regulation, meaning-making processes, and the lived physiological and relational realities of leaders and followers. Correspondingly, the epistemological position of the study is non-positivist and interpretive, recognising that knowledge regarding

complex organisational phenomena such as leadership is developed through theoretical integration, conceptual synthesis, and abductive reasoning rather than solely through direct empirical measurement. This stance aligns with the commentary-based synthesis methodology employed in the thesis, which seeks to generate explanatory theoretical mechanisms by systematically integrating established empirical findings from multiple scholarly traditions rather than producing new primary datasets. Methodologically, this philosophical positioning supports the use of PRISMA-guided corpus construction, Gioia-informed conceptual coding, and abductive theoretical integration as appropriate strategies for theory-building research, ensuring alignment between the interpretive epistemology of the study and its analytical procedures.

The decision to pursue a non-empirical doctoral contribution is justified by the theory-building purpose of the research and by the recognition that integrative conceptual work constitutes a legitimate and necessary stage of scientific advancement, particularly in interdisciplinary domains where empirical traditions remain theoretically fragmented. Consistent with PhD by Prior Publication and theory-building doctoral guidelines, the contribution of the present thesis lies in articulating a coherent explanatory framework, the neuro-relational model of introspective leadership, that synthesises established empirical literature into a unified mechanism-based theory capable of guiding future empirical inquiry. Within this form of conceptual research, validity is not established through statistical generalisation but through criteria of theoretical coherence, transparency of analytic procedure, systematic corpus selection, and demonstrable explanatory integration across previously disconnected bodies of knowledge. Accordingly, the rigour of the thesis is supported through explicit documentation of the literature identification process, structured conceptual coding procedures, reflexive analytic memoing, and clear articulation of the theoretical pathways derived from the synthesis, ensuring that the resulting framework represents a defensible scholarly contribution rather than an unsystematic narrative review.

3.3 The Commentary-Based Synthesis Approach: A Method for Theory Building

The commentary-based synthesis is a distinct and rigorous form of conceptual scholarship designed specifically to generate novel theoretical frameworks through the critical analysis, integration, and extension of existing literature and, in this case, the author's own prior contributions. It sits within an established tradition of integrative theoretical scholarship in the management and organisational sciences. Torraco (2005) argues that integrative literature reviews serve a theory-building function when they move beyond summarising evidence to reconceptualise topics and generate new frameworks, and Cornelissen (2017) identifies disciplined conceptual reasoning as a legitimate and necessary mode of theorising in organisational research. The present commentary-based synthesis draws on both traditions: it applies Torraco's emphasis on synthetic reorganisation with Cornelissen's standards for conceptual clarity and mechanism specification. Its primary purpose is not to summarise or appraise existing knowledge but to actively synthesise it into a new, generative model that possesses greater explanatory power than its constituent parts. It is crucial to differentiate this approach from other, more common forms of literature-based research. A commentary-based synthesis is not a systematic literature review, which typically aims to provide a comprehensive and unbiased summary of all available evidence on a specific, narrowly defined question. While this thesis employs systematic search procedures, its goal is synthetic and generative, not summative. To be precise, the methodological design is best characterised as a systematic integrative theoretical review (Tranfield, Denyer and Smart, 2003; Torraco, 2005): it employs systematic search and screening protocols to construct the corpus but applies these to a theory-building rather than an evidence-aggregation purpose. It is not a meta-analysis producing pooled effect sizes, nor is it an exhaustive evidence map. It is a concept-building systematic review in which the "data" are theoretical constructs, arguments, and empirical findings within published scholarly texts, and the "output" is a new integrative theoretical framework. Nor is it a *meta-analysis*, which

is a statistical method for aggregating the quantitative results of multiple empirical studies to determine an overall effect size. The "data" for a commentary-based synthesis are not numerical findings but are the theories, constructs, arguments, and evidence presented within scholarly texts.

This methodological approach can be understood as a form of strategic conceptual integration, a scholarly process of identifying disconnected theoretical constructs in siloed academic disciplines and generating new explanatory power through their systematic integration. The preceding chapters have repeatedly highlighted the "siloed approach" and the "critically under-theorised" intersections between introspective leadership, PVT, and LMX. These represent conceptual market inefficiencies. For instance, the explanatory power of Polyvagal Theory (Porges, 2018) is well-established in clinical psychology and trauma studies but remains significantly under-leveraged in mainstream leadership theory. Similarly, LMX theory (Graen and Uhl-Bien, 1995) offers a powerful framework for understanding relational outcomes but often lacks a deep, physiological mechanism to explain how trust and psychological safety are formed at a biological level.

The commentary-based synthesis is the formal method by which this research "acquires" these powerful concepts from their home disciplines and integrates them into a new, combined portfolio: the neuro-relational model of introspective leadership. The "value" created by this synthesis is a dramatic increase in explanatory power. The integrated model can explain phenomena that the individual theories cannot on their own, such as providing a neurobiological account of how a leader's introspective practice of emotional self-regulation is physiologically transmitted to and perceived by a follower, thereby directly shaping the quality of their dyadic relationship. Framing the methodology in this way underscores its strategic, value-creating nature and counters any perception of it being a passive or uncritical review of existing literature.

3.4 Delineating the Corpus of Analysis

For a conceptual study, the "data" consists of the core arguments, theoretical constructs, and empirical evidence presented within a defined set of scholarly texts. The rigour of the synthesis depends on the transparent and defensible delineation of this analytical corpus. This study's corpus is composed of two distinct but related sets of texts: the author's own collection of prior publications, anchored by the entry-point study Vanderpal and Brazie (2022a), and a systematically curated body of supporting literature.

Although the author's prior publications differ in empirical domain, ranging from leadership style (Vanderpal and Brazie, 2022a), to investor and financial bias (Vanderpal and Brazie, 2022b), HRM recruitment and selection bias (Vanderpal and Brazie, 2022c), employee turnover and work culture (Vanderpal and Brazie, 2023b), and agile team co-regulation (Vanderpal and Brazie, 2024), together with the practitioner translation offered in Steadfast Leader (Brazie and Vanderpal, 2023a), they share a common methodological character. Each is an exploratory, secondary-source work that synthesises existing theoretical and empirical literature through a Polyvagal lens rather than reporting primary data collection. What varies across the collection is the analytical lens applied to that shared design: the domain of application, the organisational outcome examined, and the pillar of the neuro-relational model most directly engaged. Thus the recruitment study (2022c) reads the dysregulation mechanism through an evaluative-bias lens, the turnover study (2023b) through a relational and cultural lens, and the agile study (2024) through a team co-regulation lens, while each rests on the same synthesising design. This consistency of method alongside diversity of analytical focus is what allows the collection to be read as a cumulative programme of scholarship rather than a set of unrelated studies, and it is why the present commentary can integrate the works into a single model without conflating their distinct contributions. The subsection that follows examines Vanderpal and Brazie (2022a) in greater depth, not because

it is the sole foundation of the thesis, but because it is the entry point at which the Polyvagal-leadership argument was first advanced and from which the remaining works extend.

3.4.1 The Foundational Text: A Critical Review of Vanderpal and Brazie (2022a)

The conceptual springboard for this thesis is the author's prior peer-reviewed publication, Vanderpal and Brazie (2022a). As stated in Chapter 1, this thesis "explicitly builds upon my previous research," which "established foundational evidence on how unresolved stress and trauma, as articulated through Polyvagal Theory (PVT), affect leadership behaviour and decision-making processes." While that previous work focused primarily on human resource management contexts, this thesis broadens that foundational understanding to introduce a comprehensive neuro-relational model. In doing so, this work not only addresses the neglected interrelationship between introspection, autonomic self-regulation, and dyadic relational quality but also substantially extends the scope of prior empirical insights towards broader leadership practices (Vanderpal and Brazie, 2022a).

The process of analysis applied to this foundational text involves a critical and reflexive re-examination. This process serves to identify the article's core contributions (i.e., the initial linking of PVT to leadership behaviour), its inherent limitations (i.e., its narrower focus on HRM and diagnostic, rather than developmental, implications), and the key theoretical threads that are explicitly extended in the current, more comprehensive thesis. The inclusion of the author's own work transforms the methodology from a standard synthesis into a form of reflexive inquiry. The author's intellectual journey and the evolution of their ideas become a part of the methodological narrative, adding a layer of authenticity and transparency to the theory-building process. This justifies the deep focus on this entry-point publication, elevating its role from a mere citation to a foundational artifact for analysis. It is important to acknowledge that this reflexive design carries an inherent circularity risk: the author's prior publications serve simultaneously as the "data" being synthesised and as part of the evidentiary base supporting the model's claims. To mitigate this risk, each claim

derived from the author's prior work is triangulated with independent, peer-reviewed sources wherever possible, and the limitations of the foundational publications, including their scope and publication context, are transparently acknowledged throughout the synthesis.

3.4.2 The Supporting Literature: A Systematic Curation

The second component of the analytical corpus is the body of supporting literature that informs the integration of the three theoretical pillars. To ensure rigour and prevent the critique of cherry-picking, this literature was curated through a two-phase process: systematic database searching followed by structured backward citation analysis (snowballing). Both phases applied identical inclusion and exclusion criteria, as described in Section 2.2.3, ensuring that the supplementary sources meet the same peer-review, publication date, and organisational context standards as the database-retrieved sources. This two-phase approach is explicitly endorsed by PRISMA 2020 (Page et al., 2021), which designates 'other methods' (including backward and forward citation searching) as a standard supplementary identification pathway (Item 7) when documented transparently in the methods section. Phase one employed a three-pillar keyword strategy across Google Scholar, Semantic Scholar, Web of Science, Scopus, PsycINFO, and Business Source Complete, yielding 1,058 initial records screened to a final set of 32 peer-reviewed sources. Phase two involved backward citation analysis seeded from five foundational papers that anchored the three-pillar framework: Porges (2018) for Polyvagal Theory; Graen and Uhl-Bien (1995) for LMX theory; Waldman, Balthazard, and Peterson (2011) for the neuroleadership – organisational behaviour interface; Arnsten (2009) for the neurobiological stress – regulation pathway; and the author's own prior work (Vanderpal and Brazie, 2022a) for the integrated PVT–leadership framework. Reference lists from these five foundational papers were systematically reviewed, and cited works meeting the inclusion criteria were assessed for eligibility. This process identified 11 additional peer-reviewed sources not returned by the initial keyword searches, bringing the final corpus to 43 sources.

The 11 snowballed sources cluster around the Pillar 3 outcome constructs of the neuro-relational model: psychological safety (Edmondson and Lei, 2014; Frazier et al., 2017; Carmeli, Brueller and Dutton, 2009), employee voice (Liang, Farh and Farh, 2012; Nembhard and Edmondson, 2006), creative involvement and vitality (Kark and Carmeli, 2009; Gong et al., 2012), and organisational cognitive neuroscience (Waldman et al., 2011; Senior, Lee and Butler, 2011; Molenberghs et al., 2017). An examiner may question why sources that reference only one pillar were retained when the inclusion criterion specifies a minimum of two pillars. The answer lies in the theoretical architecture of the neuro-relational model itself. The model distinguishes between mechanism sources (those that address the physiological and introspective processes constituting Pillars 1 and 2) and outcome sources (those that operationalise the relational and organisational consequences constituting Pillar 3). A model that specifies its causal mechanisms without independently grounding its outcome constructs in peer-reviewed literature would be theoretically incomplete. The seven P3-only sources therefore serve a distinct and necessary epistemological function: they provide the evidential basis for the claim that psychological safety, voice, and creative involvement are the organisational manifestations of autonomic co-regulation, specifically the dependent side of the neuro-relational pathway. This design decision follows Torraco's (2005) guidance that integrative reviews must synthesise the full conceptual terrain of a problem domain, which in this case requires grounding both the mechanism and the outcome constructs independently.

A further examiner challenge may concern the publication dates of the seven P3-only sources, six of which appear between 2006 and 2012, predating any systematic application of Polyvagal Theory to leadership contexts. This chronological pattern strengthens rather than weakens the thesis's central argument. The existence of a mature, well-developed body of literature on psychological safety, voice, and relational quality, established independently of and prior to any neurobiological leadership theory, is precisely the condition that makes the

integration proposed by this thesis non-trivial and original. Had PVT leadership applications and psychological safety research already been integrated by 2012, there would be no theoretical gap for this thesis to fill. The temporal separation between these two bodies of work is empirical evidence of the siloing this thesis identifies in its literature review and seeks to resolve through the neuro-relational model.

Each of the 11 snowballed sources is substantively cited in the thesis body, not merely listed in the reference list. Their evidential roles range from providing meta-analytic confirmation of psychological safety antecedents and outcomes (Frazier et al., 2017: five body citations; Edmondson and Lei, 2014: four body citations) to grounding the neurological basis for collective-oriented leadership behaviour (Molenberghs et al., 2017) and positioning organisational cognitive neuroscience as the bridge discipline that legitimises the PVT–LMX integration (Senior, Lee and Butler, 2011; Waldman et al., 2011). The complete de-duplicated corpus of all 43 sources is presented in Table 3 (Section 2.8), with Table 2 providing the database-search audit trail for the 32 primary sources. The PRISMA 2020 flow diagram (Figure 2) documents the database search branch; the 11 snowballed sources constitute the supplementary identification branch in accordance with PRISMA 2020 Item 7.

3.5 The Process of Analysis and Synthesis

This section details the intellectual process through which the textual data from the delineated corpus were analysed and integrated to construct the neuro-relational model. This was a multi-stage process involving the deconstruction of core concepts followed by their active and systematic synthesis into a new, coherent framework.

3.5.1 Thematic Analysis and Conceptual Deconstruction

The first stage of the analysis was analogous to a qualitative thematic analysis, applied to theoretical texts rather than interview transcripts. This involved a systematic process of identifying, defining, and deconstructing the core conceptual "building blocks" within each of the three theoretical pillars. The goal was to isolate the most fundamental and

relevant constructs to prepare them for integration. This deconstruction was not merely a process of summarisation but an analytical act of distillation. For example, from the literature on Polyvagal Theory, the construct of "neuroception", the subconscious process by which the nervous system scans for cues of safety and danger, was isolated as a key mechanism (Porges, 2018). From the extensive literature on LMX, the concept of "high-quality dyadic relationships," characterised by mutual trust, respect, and influence, was identified as the critical relational outcome (Graen and Uhl-Bien, 1995). From the emerging work on introspective leadership, the definition of introspection as a "cyclical and interdependent process" of reflection driving ethical behaviour was extracted (Johnson, 2023). Finally, from empirical LMX research, the specific behaviour of "feedback delivery tactics" was identified as a tangible antecedent to relational quality (Alo and Arslan, 2022). This process of deconstruction created a parsimonious set of core concepts that formed the raw material for the synthesis.

3.5.2 The Integrative Framework: Constructing the Neuro-Relational Model

The second and most critical stage was the active process of synthesis, where the deconstructed concepts were systematically woven together to form the new model. This was accomplished through three distinct but overlapping intellectual moves:

1. **Mapping Connections:** This involved identifying and charting the explicit and, more often, implicit links between the core concepts across the different theoretical pillars. For instance, a direct connection was mapped between the physiological state of "ventral vagal engagement" as described by Porges (2018) and the psychosocial state of "psychological safety" that is foundational to high-quality LMX. The synthesis makes the argument that the latter is the experiential manifestation of the former; one cannot exist without the other.
2. **Bridging Mechanisms:** This move involved using the explanatory power of one theory to provide a missing mechanism for another. The most significant instance of this in

the thesis is the use of Polyvagal Theory as the neurobiological bridge that explains *how* the introspective practices of a leader (Pillar 1) are transmitted and perceived by a follower to influence the quality of the LMX dyad (Pillar 3). The literature connecting introspection and LMX often describes a correlation but fails to explicate the embodied, physiological process that mediates it. PVT provides that missing link, explaining that a leader's regulated autonomic state transmits non-verbal cues of safety (e.g., prosody of voice, relaxed facial muscles) that are neurocepted by the follower, thereby co-regulating the follower into a state of safety and trust conducive to a high-quality relationship.

3. Conceptual Re-framing: This is the final and most transformative move of the synthesis, where existing concepts are redefined and enriched through the new, integrated lens. The central example of this is the re-framing of "introspection." Within the neuro-relational model, introspection is no longer conceptualised as a purely cognitive, disembodied process of inward reflection. Instead, it is re-framed as an *embodied capacity* for interoception and autonomic self-awareness, the ability to attune to one's own physiological state and actively regulate it towards the ventral vagal state of social engagement. This re-framing is the cornerstone of the thesis's contribution, transforming leadership development from a behavioural or cognitive exercise into an embodied, psychophysiological practice.

3.5.3 Analytical Procedure and Coding Integrity

As a transparency enhancement measure, and in a deliberate attempt to ensure methodological rigour, a structured analytical protocol was implemented, adapted from the logic of Gioia, Corley, and Hamilton (2013) while modified for textual theoretical data rather than interview transcripts. Since I am the sole researcher, I conducted the coding process. Thus, procedures emphasising reflexive documentation, iterative validation, and conceptual stability were employed to maintain analytical reliability and traceability. Analysis began

with a systematic review of the finalised corpus of 43 peer-reviewed sources identified in Chapter 2. Each article, chapter, or foundational theoretical work was read in full, and theoretically relevant constructs were extracted using the original terminology employed by the respective authors. Particular attention was given to constructs describing (a) leader introspective processes (e.g., reflective practice, humility, active listening), (b) autonomic and neurophysiological mechanisms (e.g., neuroception, ventral vagal engagement, autonomic regulation), and (c) relational exchange processes (e.g., dyadic trust, psychological safety, feedback delivery tactics). Extracted constructs were logged in a structured concept-mapping matrix that recorded the source, conceptual term, theoretical mechanism described, and provisional alignment with the three conceptual pillars guiding the thesis (Introspective Leadership, Polyvagal/Autonomic Regulation, and LMX/Relational Dynamics).

Following initial extraction, the coding process proceeded through iterative abstraction cycles in which concept lists were repeatedly compared across the full corpus to identify convergence, redundancy, and cross-pillar linkages. Constructs appearing across multiple theoretical traditions were examined through constant comparative analysis, allowing concept clusters to be progressively grouped into interpretive second-order themes that captured shared mechanisms across disciplines. Through this iterative comparison, recurrent integrative themes such as neuroceptive attunement, introspective regulation, and relational calibration emerged as cross-cutting explanatory categories linking physiological regulation, reflective awareness, and dyadic relational outcomes. Abstraction cycles continued until the addition of further corpus review produced no substantively new thematic categories, indicating conceptual saturation at the interpretive level.

Second-order themes were subsequently synthesised into aggregate theoretical dimensions representing the macro-structural building blocks of the neuro-relational leadership model. These included dimensions such as embodied introspection, relational feedback loops, and dyadic trust regulation, each integrating constructs drawn from multiple

theoretical traditions. Concept collapsing followed a rule of theoretical parsimony: constructs were merged only when they demonstrated functional equivalence across at least two conceptual pillars and when integration enhanced explanatory coherence without obscuring theoretical specificity. For example, constructs such as “psychological safety,” “dyadic trust,” and “co-regulation” were retained as distinct but nested relational expressions within the broader dimension of dyadic trust regulation rather than being collapsed into a single generalised relational construct.

Throughout the analysis, reflexive analytic memos were maintained to document conceptual decisions, emerging cross-disciplinary linkages, competing interpretations, and the rationale for theme consolidation. These memos supported an abductive reasoning process in which insights from Polyvagal Theory, introspective leadership theory, and LMX research were iteratively examined to identify previously under-theorised mechanisms connecting leader internal regulation with relational leadership outcomes. When unexpected conceptual correspondences emerged, most notably the alignment between ventral vagal regulation and psychological safety constructs, these observations prompted targeted re-examination of the corpus to confirm conceptual convergence rather than forcing the emerging model into predetermined theoretical categories.

Conceptual categories were considered stabilized when three conditions were satisfied: additional corpus review yielded no new first-order constructs requiring new thematic categories; cross-source comparison demonstrated consistent conceptual alignment within each aggregate dimension; and re-analysis of previously coded sources resulted only in minor definitional refinements rather than structural category changes. Because coding was conducted by a single researcher, analytical integrity was reinforced through iterative corpus re-review at each abstraction stage, maintenance of documented coding matrices and analytic memos, and continuous alignment checks between extracted constructs and the developing theoretical architecture of the neuro-relational model. Collectively, these procedures ensured

that the resulting Gioia-informed data structure reflects a transparent, systematic, and theoretically grounded conceptual integration rather than a descriptive narrative synthesis.

3.6 Ensuring Methodological Rigour and Trustworthiness

A primary challenge for any non-empirical, theory-building research is to establish its rigour and validity in the absence of new empirical data. It is recognised that "critics argue these models lack sufficient empirical validation and conceptual clarity" (Gardner et al., 2021, p. 12), and this thesis directly addresses that valid critique. It demonstrates the model's empirical grounding by citing rigorous studies (e.g., Kolacz et al., 2019; Vanderpal and Brazie, 2022a) that validate the effectiveness of neuro-relational frameworks in leadership contexts. The rigour of a conceptual study is not assessed by statistical significance or replicability but by a distinct set of criteria drawn from the philosophy of science and the literature on theory development.

The following criteria were applied throughout the development of the neuro-relational model:

- **Logical Coherence:** This criterion demands that the internal logic of the model is sound and free from self-contradiction. The connections drawn between PVT, LMX, and introspective leadership must be logically consistent and plausible. Every effort has been made to ensure that the synthesis does not misrepresent or distort the core tenets of the foundational theories from which it draws.
- **Explanatory Power:** A successful theoretical model must be able to offer a more comprehensive, nuanced, and insightful explanation of a phenomenon than existing theories can provide on their own. The neuro-relational model's validity rests on its ability to explain the link between a leader's inner world and their relational outcomes more fully than introspective leadership theory, PVT, or LMX theory can in isolation. It achieves this by providing the missing physiological mechanisms that underpin the observed correlations between leader traits and relational quality.

- Parsimony: This criterion, also known as Occam's razor, suggests that a model should be as simple as possible while still accounting for the phenomenon in question. The neuro-relational model strives for parsimony by focusing on the core, essential constructs from each theory and integrating them into a streamlined framework that avoids unnecessary complexity.
- Heuristic Value (Generativity): Perhaps the most critical criterion for a new theoretical model is its ability to stimulate and guide future research. The model's success is ultimately measured by its capacity to generate novel, specific, and, most importantly, *testable propositions*. This criterion positions the theoretical work not as an end in itself but as a vital, generative engine for future empirical science. The neuro-relational model demonstrates high heuristic value by suggesting a clear programme for future research. Rather than advancing formal hypotheses, which would be inconsistent with the exploratory, theory-building character of this thesis, the model generates testable propositions and concrete lines of empirical inquiry. For example, it invites future researchers to examine whether Polyvagal-informed self-regulation training improves follower-rated LMX quality relative to conventional leadership training, and whether physiological co-regulation between a leader and a team member during feedback relates to perceived psychological safety. These directions are developed more fully as suggested quantitative approaches in Section 4.5.2.

By satisfying these criteria, this commentary-based synthesis establishes its methodological rigour and makes a substantive, trustworthy contribution to the field of leadership studies. It is acknowledged, however, that the absence of inter-coder reliability checks or external peer debriefing constitutes a limitation inherent to single-researcher doctoral research. While the reflexive safeguards described above (analytic memoing, two-pass recoding, category stabilisation criteria) strengthen analytical traceability, they do not fully substitute for the

independent validation that multiple coders or external auditors would provide. Future research extending this model should consider incorporating such procedures to further strengthen the coding process.

3.7 Chapter Summary

This chapter has articulated and justified the methodological framework underpinning this thesis. It established that the research's core philosophical assumption, that leadership is an embodied, psychophysiological, and relational system, necessitates a non-empirical, theory-building approach. The commentary-based synthesis was defined as a rigorous method for conceptual scholarship, distinct from other forms of literary review, that is uniquely suited to the task of integrating disparate theoretical frameworks. The chapter delineated the analytical corpus, comprising 43 peer-reviewed sources identified through PRISMA-guided search and screening, and detailed the multi-stage intellectual process of deconstruction and synthesis used to construct the new model. Finally, it outlined the specific criteria of logical coherence, explanatory power, parsimony, and heuristic value that ensure the trustworthiness and rigour of the final theoretical contribution. Having established the methodological framework the "how" of this research, the thesis now moves to its substantive contribution. The following chapter will present the results of this methodological process: the fully articulated neuro-relational model of introspective leadership.

Chapter 4: Discussion

This chapter presents and discusses the neuro-relational model of introspective leadership, which constitutes the principal theoretical contribution of this thesis. It is organised into five sections. Section 4.1 recapitulates the model's architecture as developed through the synthesis conducted in Chapter 3. Section 4.2 answers both research questions by tracing the model's causal logic and formally stating five theoretical propositions. Section 4.3 articulates the theoretical contributions and innovations the model represents. Section 4.4 translates the model into practical implications for leadership development and organisational design. Section 4.5 acknowledges the model's limitations and proposes a generative agenda for future empirical and qualitative inquiry. Together, these sections demonstrate how the integration of Polyvagal Theory, introspective leadership frameworks, and LMX theory produces a coherent and original advance on the existing literature.

4.1 Recapitulation of the Integrated Model

The central argument of this thesis has been that leadership theory, in its current form, is constrained by a "siloe approach" that fails to account for the profound interplay between a leader's internal state, their physiological regulation, and their interpersonal effectiveness (Vanderpal and Brazie, 2022a). As established in the preceding chapters, the fields of introspective leadership, Polyvagal Theory (PVT), and Leader-Member Exchange (LMX) theory have evolved largely in isolation, leaving a critical theoretical gap that limits both scholarly understanding and practical application. Introspective leadership has been conceptualised without sufficient attention to its biological and relational underpinnings, while the powerful explanatory frameworks of PVT and LMX have not been fully integrated into a cohesive model of leadership practice (Johnson, 2023; Porges, 2018; Graen and Uhl-Bien, 1995). This thesis responds directly to this omission by proposing a neuro-relational model of introspective leadership, a framework designed to provide a more holistic,

embodied, and scientifically grounded understanding of how leaders can effectively navigate the complexities of the modern organisational landscape. This integrated approach is essential because, without it, leadership training risks remaining superficial and failing to address the root causes of relational friction and dysregulation in the workplace.

The neuro-relational model, presented conceptually in Chapter 1, posits that leadership effectiveness is not merely the product of specific behaviours or traits but is a systemic outcome of a continuous, dynamic feedback loop. This loop consists of four interconnected components that build upon one another to create a foundation for effective, trust-based leadership, demonstrating how internal states translate into external impact. These components are:

1. **Introspective Practice (The Leader's Intervention):** This is the starting point, where the leader engages in deliberate practices of self-reflection and self-awareness, such as those described by Daudelin (1996) and Johnson (2023), which build the crucial capacity for the next stage.
2. **Autonomic Self-Regulation (The Physiological Mechanism):** Introspection cultivates the leader's ability to consciously sense and manage their own physiological state, moving from reactivity to regulation, thereby enhancing what neuroscientists refer to as "vagal tone" (Porges, 2018). This enables the leader to achieve and maintain the biological foundation for safety.
3. **Ventral Vagal State (The Biological Foundation for Safety):** By engaging in self-regulation, the leader can more consistently operate from the ventral vagal state of the autonomic nervous system, a state of calm, connection, and social engagement, as described by Polyvagal Theory (Porges, 2018). This state is the physiological prerequisite for genuine empathy and open communication.
4. **Quality of the Leader-Member Exchange (The Relational Outcome):** The leader's ventral vagal state is not a private experience; it is transmitted through non-verbal

cues and is subconsciously "neurocepted" by followers. This transmission of safety directly shapes the quality of the dyadic relationship, fostering the trust, respect, and mutual influence that characterise high-quality LMX (Graen and Uhl-Bien, 1995).

This model fundamentally reframes leadership, suggesting that effective leadership is not something one simply *does*, but rather a state of *being* from which effective action naturally emerges. Traditional leadership development often focuses on behavioural mimicry, teaching leaders to adopt the external actions of successful exemplars, such as practicing specific "active listening" techniques (Gustafson et al., 2022). The neuro-relational model highlights the potential limitations of this approach, arguing that such training is often "performative rather than transformative" because it ignores the underlying physiological state (Vanderpal and Brazie, 2022a). A leader operating from a sympathetic (threat) state may be physiologically constrained in their capacity for genuine active listening; their physiology is primed for defence, not for open, empathetic connection (Porges, 2018). The prerequisite for the *behaviour* of listening is the *physiological state* of ventral vagal safety. Therefore, the primary leverage point for leadership development is not the behaviour itself but the cultivation of the underlying physiological state that makes the behaviour possible and authentic, representing a profound shift in the theory of change for leadership training.

4.2 Answering the Core Research Questions

The explanatory power of the neuro-relational model is best demonstrated by its ability to provide clear and robust answers to the core research questions that have guided this inquiry. By integrating the three theoretical pillars of introspective leadership, Polyvagal Theory, and LMX theory, the model illuminates the precise mechanisms that connect a leader's inner world to their relational impact. This integration moves beyond simple association to specify a mechanism-level pathway through which internal regulation plausibly shapes external effectiveness, offering a more complete explanatory account than any single theory could provide in isolation. The framework provides a new lens for understanding how

leadership unfolds at a biological and relational level, offering deeper insights than any of the theories could in isolation. This synthesised perspective is crucial for developing more effective and humane leadership practices that are grounded in both science and relational attunement.

4.2.1 The Neurophysiological Foundations of LMX (Answering RQ1)

The first research question asks: *How do leaders' neurophysiological states, as explained by Polyvagal Theory, influence the quality of leader-member exchanges in feedback-intensive environments?* (Vanderpal and Brazie, 2022a). The answer lies in the Polyvagal concept of neuroception, the subconscious, non-cognitive process by which our nervous systems scan for and respond to cues of safety and danger (Porges, 2018). A leader's autonomic state is not a private, internal experience; it is constantly being broadcasted through a host of non-verbal cues, including the prosody of their voice, their facial micro-expressions, their posture, and their breathing rate. Followers, through their own process of neuroception, subconsciously detect and interpret these physiological signals, which in turn shapes their own autonomic state and their perception of the relationship. This biological dialogue occurs beneath the level of conscious thought but has a powerful and direct impact on workplace dynamics and relational quality.

When a leader operates from a ventral vagal state, they transmit unmistakable cues of safety and calm that foster connection and trust. In organisational terms, those safety cues are not only experienced as “trust” but are behaviourally expressed through psychological safety and voice: followers become more willing to speak up, ask for help, report errors, and contribute improvement-oriented ideas when they perceive the interaction climate as safe (Edmondson and Lei, 2014; Frazier et al., 2017; Liang et al., 2012). Their voice is more melodic, their facial expressions are more open and engaging, and their physical presence is grounded and reassuring. These cues are neurocepted by the follower, which helps to calm the follower's own nervous system, creating a physiological state of safety that is the

biological substrate of trust, openness, and psychological safety, the very bedrock upon which high-quality LMX is built (Graen and Uhl-Bien, 1995; Porges, 2018). Once psychological safety is established, followers are more likely to engage in learning behaviours and discretionary contribution, including speaking up with concerns or improvement suggestions, which helps explain why high-quality exchange climates are linked to better team adaptation and performance (Edmondson and Lei, 2014; Frazier et al., 2017). In creative and knowledge-work settings, safe relational climates also predict creative involvement and idea implementation, strengthening the model's practical relevance beyond feedback episodes alone (Carmeli et al., 2009; Kark and Carmeli, 2009; Gong et al., 2012). Conversely, when a leader operates from a sympathetic state, perhaps due to stress, anxiety, or organisational pressure, they transmit neuroceptive cues of danger. Their voice may become more monotonic or sharp, their body language more rigid, and their presence more agitated, making them appear anxious or aggressive. These signals trigger a defensive state in the follower, making them less open, less creative, and more guarded, which actively corrodes LMX quality and transforms potentially constructive interactions into perceived attacks (Kolacz et al., 2019).

This neurobiological explanation provides the missing physiological mechanism for the findings of researchers like Alo and Arslan (2022), who demonstrated empirically that a supervisor's feedback delivery *tactics* are a powerful antecedent to LMX quality. The neuro-relational model explains *why* these tactics work: attuned, constructive feedback can only be delivered authentically by a leader who is in a regulated, ventral vagal state. It is this underlying physiological state, as much as the words themselves, that the follower receives and responds to at a subconscious, biological level. Furthermore, this aligns with the author's previous work, which showed that a leader's dysregulated state, stemming from unresolved stress or trauma, directly degrades their capacity for fair evaluation and relational availability, thereby compromising the dyadic exchange (Vanderpal and Brazie, 2022c). This

dysregulation impairs the very cognitive and emotional functions necessary for building trust and maintaining relational coherence.

Ultimately, this perspective suggests that the quality of a leader-member exchange can be conceptualised, within this framework, as a reflection of successful or failed dyadic co-regulation. High-quality LMX can be understood as a state of mutual ventral vagal engagement, where the leader and follower are in a state of physiological synchrony and safety, allowing for open communication and collaboration. Low-quality LMX, in contrast, reflects a chronic state of dyadic dysregulation and threat, where interactions are guarded, transactional, and corrosive to morale. Because of their position of power and influence, the leader serves as the primary regulator in the dyad. Importantly, this regulatory influence operates within an asymmetric power structure: leaders control evaluation, resources, and access, which means followers may suppress honest feedback even when leaders intend openness. This is precisely why psychological safety and voice mechanisms are essential boundary conditions for interpreting “high-quality exchange” as more than closeness or in-group favouritism. A regulated leader can help to co-regulate a stressed follower back into a state of safety, thereby strengthening the LMX bond, whereas a dysregulated leader will inadvertently co-regulate the follower into a state of threat, damaging the bond. This reframes many leadership failures not as moral or intellectual failings, but as failures of self-regulation.

4.2.2 Introspection as an Interventional Practice for Autonomic Regulation (Answering RQ2)

The second research question asks: *How can introspective leadership practices mediate the relationship between autonomic regulation and inclusive, trust-centred leadership outcomes?* (Vanderpal and Brazie, 2022a). The neuro-relational model posits that introspection is the primary mediating practice that enables leaders to gain conscious influence over their own biology. It serves as the crucial bridge between the raw, often reactive physiology of the autonomic nervous system and the cultivation of high-quality,

trust-based relationships that define effective leadership. Introspection, therefore, is not merely a passive act of reflection but an active intervention that allows a leader to shift from being a product of their physiological state to being an architect of it. This capacity is the cornerstone of embodied leadership and is essential for navigating complex relational dynamics with wisdom and compassion.

This requires a re-framing of the introspective traits identified in the literature, such as the six foundational traits of self-awareness, emotional intelligence, humility, empathy, active listening, and continuous reflection identified by Johnson (2023). Within the neuro-relational model, these are not seen as abstract virtues or purely cognitive skills but are understood as the *outcomes* of a developed capacity for interoception, the ability to sense, interpret, and consciously attend to one's own internal bodily signals. Practices such as structured reflection (Daudelin, 1996), mindfulness, and even the creative identity-building exercises proposed by Woelfel (2024), such as creating a "Recipe of Me," are not just mental exercises. They are forms of neurobiological training that strengthen the neural pathways between the prefrontal cortex and the limbic system, which enhances what neuroscientists refer to as "vagal tone", the efficiency and flexibility of the ventral vagal system (Porges, 2018).

As Watts (2012) argues from his extensive experience in executive coaching, introspection builds the "internal architecture" necessary for resilience and emotional regulation under stress. The neuro-relational model provides a clear physiological explanation for this architecture: it is, in fact, a more flexible, coherent, and well-regulated nervous system. A leader skilled in introspection, redefined here as embodied self-awareness, can notice the subtle physiological signs of shifting into a sympathetic state, such as a tightening in the chest, shallow breathing, or muscle tension. Because they can notice these signals early, they can then intervene before reactivity takes over. They can use conscious regulatory techniques, such as focused breathing or a momentary pause, to guide themselves

back to a ventral vagal state *before* they act or speak, thereby choosing a response rather than having a reaction.

This capacity for real-time, conscious self-regulation is what allows a leader to mediate the relationship between their internal state and their external impact, making it the core competency of introspective leadership. It is this skill that enables them to deliver feedback constructively even when the topic is difficult (Alo and Arslan, 2022), to remain open and mitigate unconscious biases under pressure (Vanderpal and Brazie, 2022c), and to consistently create the conditions of safety and connection that lead to inclusive, trust-centred leadership outcomes. In this view, introspection ceases to be a "soft skill" and becomes a form of applied personal neuroscience. It is the practical, learnable meta-competency of managing one's own biology in service of prosocial and organisational goals, offering far greater leverage than simply learning isolated behavioural scripts.

4.2.3 Formal Theoretical Propositions

Having articulated the neuro-relational model and demonstrated its capacity to address the core research questions, it is now possible to formalise the model's theoretical claims as a set of explicit propositions. These propositions serve two purposes: they crystallise the model's explanatory architecture into testable theoretical statements, and they provide a structured foundation upon which future empirical research programmes can be designed. Each proposition is derived directly from the commentary-based synthesis and integrates constructs from across the three theoretical pillars.

Proposition 1 (Autonomic–Relational Pathway): Leader ventral vagal regulation positively influences the quality of leader–member exchange through the transmission of neuroceptive safety cues (vocal prosody, facial expression, attentional presence) that are subconsciously detected by followers.

Proposition 2 (Introspective Moderation): Introspective practice moderates the relationship between a leader's autonomic state and feedback attunement, such that leaders

with higher introspective capacity (interoceptive awareness, reflective self-monitoring) maintain more regulated and relationally attuned feedback delivery under conditions of interpersonal stress.

Proposition 3 (Safety–Voice Mediation): Psychological safety mediates the relationship between leader–member exchange quality and employee voice behaviour, such that high-quality LMX fosters both promotive and prohibitive voice through increased felt interpersonal safety within the dyad.

Proposition 4 (Recursive Reinforcement): The relationship between leader autonomic regulation and leader–member exchange quality is recursive: sustained high-quality exchanges reinforce the leader’s regulatory capacity over time by reducing chronic threat activation, while deteriorating exchanges progressively dysregulate the leader’s autonomic baseline, creating self-reinforcing cycles of relational trust or relational erosion.

Proposition 5 (Dysregulation–Bias Pathway): Autonomic dysregulation in leaders increases vulnerability to evaluative bias (including loss aversion, in-group favouritism, and impulsive decision-making) during feedback-intensive and selection-related interactions, thereby constraining the fairness and inclusiveness of organisationally consequential judgements.

Together, Propositions 1–5 articulate the core theoretical architecture of the neuro-relational model. They specify the directional relationships between autonomic regulation, introspective capacity, feedback quality, dyadic exchange, psychological safety, and organisational voice. Critically, these propositions are advanced as theoretically derived claims requiring empirical validation rather than as established causal laws. They are intended to serve as the generative foundation for the programme of future quantitative and qualitative inquiry outlined in Section 4.5.

4.3 Theoretical Contributions and Innovations

The contributions advanced in this thesis meet the Quality Assurance Agency's Level 8 doctoral descriptor in three respects. First, the neuro-relational model constitutes the creation and interpretation of new knowledge through original scholarship of a quality designed to satisfy peer review, extend the forefront of the leadership and organisational behaviour disciplines, and merit publication in leading management and applied psychology journals. Second, the thesis demonstrates a systematic acquisition of a substantial body of knowledge at the forefront of the intersection between neuroscience, relational leadership theory, and introspective practice, an intersection that prior scholarship has explored only partially and in silos. Third, the thesis demonstrates the general ability to conceptualise and design a project for the generation of new theoretical knowledge, to adjust that design in response to identified epistemological limits, and to specify the empirical programme through which the model's claims can subsequently be tested.

The synthesis of introspective leadership, Polyvagal Theory, and LMX theory into a single, coherent framework represents a significant theoretical contribution to the field of leadership studies. The neuro-relational model offers not just an incremental addition to existing knowledge but a substantive reconceptualisation of how leadership is conceptualised, studied, and developed. Its primary innovations are threefold, each addressing a critical limitation in the current understanding of leadership by providing a more complete and scientifically grounded picture of the leadership process. This integration moves the field forward by offering a model that is both deeply explanatory and eminently practical, bridging the gap between internal states and relational outcomes.

4.3.1 From Cognition to Embodiment: A Paradigm Shift in Leadership Theory

The model directly challenges the disembodied, cognitivist bias that has characterised many traditional leadership theories (Amanchukwu, Stanley and Ololube, 2015). Frameworks such as transactional and transformational leadership, while valuable, often treat the leader as

a rational actor whose mind directs their actions, with the body serving as a mere vehicle for their thoughts and intentions. The neuro-relational model argues that leadership is a fundamentally embodied phenomenon, where the leader's nervous system is not incidental to their leadership but is the primary medium through which leadership is enacted, transmitted, and experienced by others. This contribution moves the field beyond a primary focus on what leaders *think* or *do* to include the critical dimension of how they *are* at a physiological level. It integrates decades of research from affective neuroscience, physiology, and trauma studies directly into the heart of leadership theory, providing a more complete picture of the leadership process (Kolacz et al., 2019; Porges, 2018).

4.3.2 Re-conceptualising Introspection as a Psychophysiological Capacity

Perhaps the model's most significant theoretical move is its re-framing of the concept of introspection, building upon and deepening existing definitions, such as Johnson's (2023) view of introspection as a "cyclical and interdependent process" of reflection. The neuro-relational model redefines introspection as an embodied capacity for interception and autonomic self-awareness. This re-conceptualization provides a deeper, more mechanistic understanding of related and popular leadership constructs like authentic leadership (Avolio and Gardner, 2005) and emotional intelligence. It suggests that these are not just psychological traits or cognitive skills but are, in fact, dependent on a leader's physiological literacy, their ability to read their own bodily cues, and their regulatory skill, their ability to consciously influence their autonomic state. This transforms introspection from a vague ideal into a tangible, psychophysiological skill that can be systematically cultivated through specific practices.

4.3.3 Providing the Missing Mechanism for Relational Leadership

Finally, the model makes a crucial contribution to relational theories of leadership, most notably LMX theory. For decades, LMX theory has robustly demonstrated that the quality of the dyadic relationship between a leader and a follower is a critical predictor of a

host of important organisational outcomes (Graen and Uhl-Bien, 1995; Dulebohn et al., 2012). However, the theory has often lacked a deep, biological explanation for the foundational elements of these relationships, such as trust and psychological safety. The neuro-relational model contributes by positing Polyvagal Theory as the missing physiological mechanism. It explains *how* trust is built at a biological level: through the repeated, successful co-regulation of the leader's and follower's nervous systems into a state of ventral vagal safety. It explains *why* feedback so often fails: because a dysregulated leader transmits neuroceptive cues of threat that make a state of psychological safety substantially more difficult for the follower to achieve (Porges, 2018). By providing this mechanism, the model adds a new layer of depth and explanatory power to the entire field of relational leadership. This move is also consistent with emerging neuroscience-informed leadership scholarship, which argues that leadership processes are partly instantiated through neurobiological systems that shape attention, emotion, and social behaviour in organisational settings (Waldman et al., 2011). To crystallize the nature of this theoretical reorientation, the following table provides a direct comparison between the core assumptions of the traditional leadership paradigm and the neuro-relational paradigm proposed in this thesis. This comparison highlights the fundamental differences in how leadership is understood, practised, and developed within each framework.

Table 5: A Comparison of Leadership Paradigms

Dimension	Traditional Leadership Paradigm	Neuro-Relational Leadership Paradigm
Unit of Analysis	Leader behaviours; Leader-follower transaction	Leader-follower dyad as a biological system
Locus of Control	External actions and observable styles	Internal physiological and emotional state
Core Competency	Behavioural skills (e.g., communication)	Autonomic self-regulation; Interoception
Theory of Change	Learning and applying new behaviours	Cultivating a more regulated nervous system
View of Trust	A psychological belief or social contract	A physiological state of safety (ventral vagal)
Role of Introspection	A cognitive act of reflection	An embodied practice of self-attunement
Development Goal	To <i>do</i> leadership more effectively	To <i>be</i> a regulated presence from which effective action emerges

4.4 Practical Implications for Organisational Practice

This study offers important implications for leadership practice, organisational development, and human resource management. The neuro-relational model developed herein bridges theory and practice by grounding leadership effectiveness in neurophysiological regulation rather than in purely behavioural frameworks. It introduces a transformative approach to cultivating adaptive, trauma-informed, and relationally attuned leaders who can foster healthier and more productive organisational cultures. The implications are discussed as follows.

4.4.1 A New Frontier for Leadership Development

The model calls for a substantial reconceptualisation of leadership development programmes, suggesting that many current training initiatives risk being "performative rather than transformative" because they focus on the superficial layer of behaviour while neglecting the physiological substrate from which all behaviour arises (Vanderpal and Brazie, 2022a). To be truly effective, future programmes must move beyond case studies and behavioural role-playing to include somatic and contemplative practices. This means incorporating evidence-based techniques such as Polyvagal-informed mindfulness, therapeutic breathwork, and interoceptive awareness exercises designed to directly increase a leader's vagal tone and enhance their capacity for real-time autonomic self-regulation (Porges, 2018). This approach aligns perfectly with the calls from practitioners like Watts (2012) for development that builds genuine internal resilience and emotional regulation. The neuro-relational model provides the scientific "why" behind their prescient recommendations, offering a clear rationale for investing in the leader's internal development.

4.4.2 Building Trauma-Informed and Psychologically Safe Organisations

The findings demonstrate that psychological safety cannot be authentically achieved without addressing the biological states of those in leadership roles. Leaders operating from

chronic sympathetic arousal or dorsal vagal shutdown inadvertently transmit cues of threat, undermining trust and collaboration. Extending prior research on trauma and workplace bias (Vanderpal and Brazie, 2022c), the neuro-relational model suggests that many disruptive employee behaviours (such as withdrawal, defensiveness, or hyper-reactivity) may represent predictable autonomic responses rather than motivational deficits. This insight calls for a fundamental reorientation of organisational practice towards trauma-informed policies that minimise systemic stressors, foster nervous-system recovery, and position leaders as agents of co-regulation. Through Polyvagal awareness, leaders learn to recognise and respond to physiological distress within themselves and others, thereby cultivating environments characterised by safety, inclusion, and sustained engagement.

4.4.3 Re-imagining Core Leadership Functions

The neuro-relational lens transforms how we approach several core leadership functions, shifting the focus from process to physiology and from management to attunement. This re-imagining makes these functions more effective and more humane by aligning them with our biological need for safety and connection, ultimately leading to better outcomes for both individuals and the organisation. The following examples illustrate this shift:

- **Feedback and Performance Reviews:** The traditional performance review is often a source of intense sympathetic activation for both leader and employee. A neuro-relational approach reframes this interaction as an opportunity for dyadic co-regulation, where the leader's first responsibility is to create a state of physiological safety. A skilled leader would first ensure they are in a grounded, ventral vagal state and then consciously use their presence, tone of voice, and pacing to help the employee feel safe enough to receive the feedback non-defensively, turning a potentially threatening evaluation into a collaborative conversation (Alo and Arslan, 2022).

- **Conflict Resolution:** The goal of conflict resolution shifts from finding a quick, logical compromise to first guiding the involved parties out of their defensive sympathetic states. Creative problem-solving and genuine empathy are substantially impaired when people are in a state of fight-or-flight, as higher-order cognitive functions are compromised (Porges, 2018; Arnsten, 2009). The leader's primary role becomes facilitating a return to a collective ventral vagal state, where the biological capacity for connection and collaboration is restored, allowing for more sustainable and integrative solutions to emerge.
- **Strategic Decision-Making:** The model provides a clear explanation for why dysregulated leaders make poor decisions, as a nervous system in a threat state impairs rational evaluation and promotes reactive, short-sighted thinking (Vanderpal and Brazie, 2022b). This implies that the quality of a leadership team's strategic thinking is contingent on their collective physiological state. Practices that promote group regulation, such as starting high-stakes meetings with a moment of shared mindfulness or a brief check-in, are no longer "fluffy" add-ons but are critical process components for ensuring high-quality cognitive performance.

4.5 Limitations and a Generative Agenda for Future Research

Demonstrating scholarly rigour requires not only articulating a model's strengths but also transparently acknowledging its limitations and the boundaries of its claims. The value of a new theoretical model is measured not only by the questions it answers but by the new, more precise questions it inspires. This section outlines the primary limitation of the current work and proposes a clear, actionable agenda for future empirical research designed to test, refine, and extend the neuro-relational model. The formal propositions articulated in Section 4.2.3 (Propositions 1–5) provide a structured foundation for this empirical agenda, specifying the directional relationships that require validation. This forward-looking agenda

is essential for transforming the conceptual framework presented here into a robust, evidence-based programme for leadership studies and practice.

4.5.1 Acknowledging the Conceptual Nature of the Thesis

The primary limitation of this thesis is that it is an act of theory-building, not theory-testing. The neuro-relational model is a logically coherent synthesis of existing theories and empirical findings from disparate fields. In keeping with earlier caution regarding Polyvagal Theory's contested elements, the model should be interpreted as organising convergent autonomic and social-engagement evidence into a leadership-relevant framework rather than claiming that every PVT-specific anatomical assertion is already settled. However, the specific causal links and mediating pathways it proposes now require rigorous empirical validation to move from plausible argument to established fact. This work directly acknowledges the valid critiques that such integrative models can lack sufficient empirical validation and conceptual clarity at their outset (Gardner et al., 2021). The following sections are offered as a direct response to that concern, positioning this conceptual work not as an end in itself but as the necessary foundation for a robust programme of future empirical inquiry that can systematically test the model's core propositions.

4.5.2 A Proposed Programme for Quantitative Inquiry

The heuristic value of the neuro-relational model lies in its capacity to generate specific and testable directions for future quantitative inquiry. Consistent with the conceptual, commentary-based, and exploratory design of this thesis, the model is developed here as theory rather than tested through hypothesis testing, and formal hypotheses are therefore not advanced as part of the present work. Instead, the propositions set out in Section 4.2.3 (Propositions 1 to 5) provide the basis from which subsequent empirical studies could derive and operationalise their own hypotheses. The following suggestions are offered not as hypotheses to be tested here but as illustrative quantitative approaches through which future researchers could test, validate, and refine the model's core mechanisms:

- **Intervention studies.** An experimental or quasi-experimental design could examine whether leaders who complete a Polyvagal-informed self-regulation training programme show greater improvement in follower-rated LMX quality and team psychological safety than a comparison group receiving conventional behavioural leadership training. Such a design would offer a way to test the autonomic-relational pathway expressed in Proposition 1, together with the model's proposed theory of change for leadership development in applied organisational settings.
- **Physiological co-regulation studies.** Dyadic measures of autonomic activity, such as portable heart rate variability (HRV) monitoring, could be used to examine how physiological synchrony between a leader and a follower during feedback conversations relates to the follower's perception of the leader's empathy and the constructiveness of the exchange. This approach would offer a way to operationalise the concept of co-regulation that underpins Propositions 1 and 4, moving it from a theoretical construct towards a measurable phenomenon in organisational settings.
- **Survey and measurement-development studies.** The development and validation of a leader autonomic awareness scale, capturing interoceptive capacity, would allow future researchers to examine whether such awareness accounts for the relationship between introspective practice, proxied for example by leader mindfulness, and follower-rated LMX quality. This approach would offer a way to test the introspective and embodied self-awareness mechanism expressed in Proposition 2.

4.5.3 A Proposed Programme for Qualitative Inquiry

Beyond quantitative validation, the lived experience of leading and being led within this paradigm needs to be explored through rich, qualitative methods that can capture the nuance and complexity of these embodied interactions. Such research is essential for understanding how the model manifests in the real world and for generating deeper insights into its application and potential challenges. This research could take several forms:

- **Phenomenological Studies:** Conducting in-depth interviews with leaders who have undergone extensive somatic or contemplative training to understand their subjective, first-person experience of self-regulation. This would explore how they perceive its impact on their key relationships and leadership effectiveness, providing a rich narrative account of the model's internal dynamics and the leader's personal transformation.
- **Case Studies:** An in-depth, ethnographic study of a team or small organisation led by an individual who naturally or through training embodies the principles of the neuro-relational model. Such a study could explore how co-regulation manifests in the subtle dynamics of daily interactions, meetings, and the overall team culture, providing a "thick description" of the model in action that quantitative methods cannot capture.

4.6 Chapter Summary

This chapter has presented, answered, and extended the thesis's core research questions through the neuro-relational model. The model's four-stage architecture, introspective practice, autonomic self-regulation, ventral vagal engagement, and co-regulatory LMX quality, has been formally stated and its five theoretical propositions developed and justified. The theoretical contributions have been distinguished from the existing literature, and practical implications for leadership development, trauma-informed organisations, and equity have been identified. Limitations have been acknowledged transparently, and a structured agenda for future empirical and qualitative inquiry has been proposed. The final chapter now concludes the thesis by synthesising the core argument, restating the principal contribution to knowledge, and reflecting on the epistemological character of the claim advanced.

Chapter 5: Conclusion

This chapter draws the thesis to a close by synthesising its core argument, restating the principal contribution to knowledge, and reflecting on the nature of the claim the thesis advances. Section 5.1 recapitulates the theoretical journey from problem identification to model construction. Section 5.2 articulates the enduring significance of the neuro-relational model for leadership scholarship and practice. Sections 5.3 through 5.6 address the reflective, epistemological, and philosophical dimensions of the work. Section 5.7 provides an integrated summary of the thesis's contributions to knowledge. The chapter is deliberately concise: the detailed argument has been made in the preceding chapters; here, the task is to state clearly and unambiguously what has been achieved, why it matters, and what it answers.

5.1 Synthesis of the Core Argument

This thesis began with a simple observation: in conditions of unprecedented complexity and emotional turbulence are increasingly challenged not by external volatility alone, but by the urgent need for internal clarity and relational depth (Hartung, 2020). It identified a critical gap in leadership studies: the failure to integrate the internal, reflective processes of introspective leadership with the neurobiological mechanisms of safety and connection and the relational dynamics of leader-member exchange. The disembodied and siloed nature of existing theories has limited our ability to understand, and therefore develop, the kind of leadership required for our time (Amanchukwu, Stanley and Ololube, 2015). In response, this thesis has developed and articulated a neuro-relational model of introspective leadership, weaving together the three disparate threads of introspective practice, Polyvagal Theory, and LMX theory into a single, coherent framework. It puts forth a central, unifying claim: that the fundamental task of the modern leader is to cultivate a regulated internal state, as this embodied capacity for self-regulation is the non-negotiable prerequisite for building the relationships of trust, fostering the psychological safety, and making the clear-headed decisions necessary to unlock collective human potential. To clarify the scope of this

contribution and support disciplined application, the following boundary conditions specify the conditions under which the model is most applicable, and therefore where its explanatory power should be expected to be strongest

However, this contribution is strongest under multiple conditions. As with all theoretical frameworks, the neuro-relational model of introspective leadership operates within specific boundary conditions that define the contexts in which its explanatory power is expected to be strongest and where caution in application is warranted. Explicit articulation of these boundaries strengthens theoretical clarity and supports future empirical testing by specifying the environmental, relational, and individual factors that may moderate the model's mechanisms. First, the model is most applicable to relationally intensive leadership contexts in which dyadic or small-group interpersonal interactions play a central role in organisational functioning. Settings such as healthcare teams, knowledge work environments, project-based teams, and leadership development contexts are particularly conducive to the model's mechanisms because these environments rely heavily on trust formation, feedback exchange, and psychological safety; conditions under which autonomic co-regulation processes are likely to be most influential. These are also the settings in which psychological safety and voice most directly determine whether teams learn, surface risks, and sustain innovation, making them ideal contexts for empirically testing the model's proposed regulation → safety → exchange → contribution pathway (Edmondson and Lei, 2014; Frazier et al., 2017; Liang et al., 2012). In highly automated or low-interaction environments where leadership influence is mediated primarily through systems, procedures, or technological interfaces, the relational transmission mechanisms emphasised by the model may be less salient.

Second, the model assumes a minimum threshold of leader self-regulatory capacity and introspective engagement. Leaders who have not yet developed the cognitive, emotional, or physiological awareness necessary for introspective self-monitoring may not fully activate

the model's proposed pathways linking introspection to relational outcomes. Consequently, the explanatory strength of the model is expected to increase in contexts where leaders participate in developmental practices such as mindfulness training, reflective leadership programmes, or emotional regulation skill development, which enhance awareness of internal physiological and affective states. Third, cultural and organisational norms may moderate the expression of neuro-relational mechanisms. Organisational climates characterised by high psychological safety, open communication, and developmental leadership norms provide fertile conditions for relational co-regulation processes to unfold. Conversely, environments marked by chronic threat, rigid hierarchy, or punitive performance cultures may constrain the relational transmission of safety cues, thereby attenuating the influence of introspective regulatory processes on follower perceptions and relational outcomes. Fourth, the model focuses primarily on non-clinical organisational populations and is not intended to function as a clinical or therapeutic framework. Although the theoretical mechanisms draw from neurophysiological principles associated with stress and trauma research, the model is designed to explain everyday leadership functioning rather than pathological conditions. Future interdisciplinary research may extend the framework to trauma-informed leadership contexts; however, such applications require careful adaptation and empirical validation. Finally, the neuro-relational model is proposed as a mid-range integrative theory, meaning that it is designed to explain a defined set of leadership phenomena, specifically, the interaction between introspective self-regulation, physiological safety signalling, and dyadic relational quality, rather than serving as a universal theory of leadership effectiveness. By explicitly specifying these boundary conditions, the model establishes a clear scope of applicability while identifying meaningful directions for future empirical refinement and contextual expansion.

5.2 The Enduring Significance of the Contribution

The neuro-relational model offers more than a new theory; it proposes a more comprehensive and physiologically grounded approach to leadership that addresses pressing organisational needs. In an era marked by widespread burnout, chronic stress, employee disengagement, and societal polarization, a model of leadership grounded in the fundamental biology of safety and connection is not an academic luxury but a practical necessity. Adopting this paradigm has the potential to profoundly impact employee well-being by transforming workplaces from sources of chronic threat into environments of co-regulation and psychological safety. It can enhance organisational resilience by equipping leaders with the internal resources to remain steady and clear amidst disruption. Furthermore, it can promote more ethical governance by recognising that autonomic dysregulation may compromise fair evaluation and sound judgment, as demonstrated in research on stress-induced biases (Vanderpal and Brazie, 2022c). Ultimately, this model provides a pathway for creating organisations where people can not only be productive but can also flourish as human beings, connecting the microcosm of a single dyad to the macrocosm of a healthier society.

This thesis has implications for scholarly dissemination beyond the doctoral examination.

Three sections of the thesis are candidates for publication in peer-reviewed outlets. The neuro-relational model itself, as developed in Chapters 3 and 4, represents a theoretical contribution suitable for submission to the *Academy of Management Review* or *The Leadership Quarterly*, both of which publish conceptual theory-building papers of this type.

The methodology chapter's articulation of the commentary-based synthesis as a rigorous non-empirical research design has independent value for the *Journal of Management Education* or the *British Journal of Management*. The practical implications developed in Section 4.4, particularly the framework for regulation-informed leadership development, are suitable for a

practitioner-facing outlet such as the Harvard Business Review or Organisational Dynamics. These represent planned next steps following successful examination.

5.3 Concluding Reflection

In the opening chapter of this thesis, a quote from Hartung (2020) served as a guiding principle: “many answers are not to be found outside but rather inside us.” The journey through the literature and the synthesis of the neuro-relational model has given this sentiment a new, profound, and biologically grounded meaning. The "inside" is not merely a space of thought and reflection but a dynamic, physiological landscape that dictates our capacity for connection, empathy, and clear-headed action. The answers we seek as leaders, how to build trust, how to inspire commitment, how to foster creativity, are found in our capacity to understand and regulate this internal landscape. The path to transforming our organisations, our teams, and our impact as leaders begins with the courageous and disciplined inner work of befriending and skilfully navigating the very nervous system that connects us to ourselves and to one another. The future of leadership is not just introspective; it is embodied, it is regulated, and it is, at its very core, deeply and irrevocably relational.

5.4 Reflexivity and Author Positionality

This thesis adopts an explicitly reflexive stance, recognising that theory-building research is necessarily shaped by the interpretive positioning of the researcher. The present work is informed by the author’s prior empirical and conceptual research examining the intersection of stress physiology, leadership decision-making, and organisational relational processes. Rather than treating this positioning as a source of bias to be eliminated, it is acknowledged as an epistemic resource that enables theoretically informed integration across disciplinary domains that are typically studied in isolation. The commentary-based synthesis method employed in this thesis required iterative interpretive engagement with the literature corpus, abductive reasoning across conceptual domains, and theory-driven abstraction of constructs into the neuro-relational leadership model.

To mitigate the risks associated with single-researcher conceptual coding, several reflexive safeguards were incorporated. Conceptual decisions were documented through analytic memoing, iterative recoding cycles were conducted across the finalised corpus of 43 peer-reviewed sources, and category stabilization criteria were applied to ensure that aggregate dimensions emerged from systematic comparative analysis rather than post-hoc conceptual preference. Additionally, the integration process was anchored in clearly defined theoretical pillars, introspective leadership, Polyvagal Theory, and Leader-Member Exchange theory, to constrain interpretive drift and maintain theoretical traceability between extracted constructs and the final model architecture. This reflexive transparency supports the methodological integrity of the thesis by making visible the interpretive processes through which theoretical integration was achieved.

5.5 Epistemological Limits and Scope of Claim

As a theory-building thesis grounded in commentary-based synthesis rather than primary empirical data collection, the claims advanced herein are necessarily conceptual and explanatory rather than causal in the statistical sense. The neuro-relational model proposed does not assert empirically verified effect magnitudes or predictive coefficients; instead, it articulates a theoretically integrated mechanism linking leader introspective capacity, autonomic self-regulation, and dyadic relational exchange processes. The epistemological contribution of the thesis therefore lies in clarifying conceptual relationships that were previously dispersed across independent literatures and in specifying testable theoretical pathways for subsequent empirical investigation. The scope of applicability of the model is strongest in feedback-intensive, relationally dense leadership contexts where moment-to-moment interpersonal regulation is central to organisational functioning, including leadership development, performance evaluation, and team decision environments. While the principles of autonomic regulation and relational exchange are broadly relevant across organisational contexts, the explanatory strength of the model may vary across cultural, institutional, and

occupational settings. Consequently, the model should be interpreted as a generative theoretical framework designed to guide future quantitative, qualitative, and mixed-methods research rather than as a finalised predictive theory.

5.6 The Nature of the Truth Advanced in this Thesis

The contribution of this thesis is best understood as advancing a mechanism-level theoretical truth rather than an empirically finalised law-like generalisation. Specifically, the thesis proposes that leadership effectiveness cannot be fully explained through behavioural, cognitive, or relational constructs alone, but must also be understood as an embodied regulatory process in which leaders' physiological states shape relational signalling, feedback interactions, and the development of trust-based exchange relationships. By integrating Polyvagal Theory, introspective leadership theory, and Leader-Member Exchange theory into a single explanatory framework, the thesis advances the proposition that autonomic regulation functions as a foundational enabling condition through which reflective awareness becomes relationally actionable. This truth claim is theoretical, integrative, and heuristic: theoretical in that it synthesises previously disconnected bodies of knowledge into a coherent explanatory architecture; integrative in that it specifies cross-disciplinary mechanisms linking physiology, reflection, and relational leadership; and heuristic in that it generates clearly testable propositions for future empirical research programmes. The neuro-relational model therefore contributes to leadership scholarship not by concluding inquiry, but by providing a theoretically grounded platform upon which subsequent empirical studies can evaluate, refine, and extend the relationships proposed. In this sense, the thesis advances a disciplined theoretical claim: that the biological regulation of leaders' internal states is not peripheral to leadership effectiveness but constitutes a central explanatory dimension of how leadership is enacted, experienced, and sustained within organisational relationships.

Table 6: Findings in Relation to Research Questions

Research Question	Integrated Finding of the Thesis	Theoretical Implication
RQ1: How do leaders' neurophysiological states, as explained by Polyvagal Theory, influence the quality of leader–member exchanges in feedback-intensive environments?	Leaders' autonomic states function as biological signalling systems that are continuously transmitted through vocal tone, facial expression, posture, and attentional presence. Followers neuroceptively detect these cues, resulting in either dyadic co-regulation (ventral vagal engagement) or defensive dysregulation (sympathetic or dorsal activation), which directly shapes trust, psychological safety, and relational exchange quality.	LMX quality is partially determined by physiological co-regulation processes rather than solely by behavioural leadership style. Relational leadership theory therefore requires integration with neurobiological regulatory mechanisms to fully explain dyadic exchange formation.

RQ2: How can introspective leadership practices mediate the relationship between autonomic regulation and inclusive, trust-centred leadership outcomes?	Introspective practices (e.g., reflective awareness, mindfulness, interoceptive monitoring) strengthen leaders' capacity for autonomic self-regulation, enabling conscious modulation of physiological reactivity during interpersonal exchanges. This regulatory capacity allows leaders to maintain relational attunement, deliver feedback constructively, and sustain psychologically safe interaction climates.	Introspection is reconceptualised as a psychophysiological regulatory competency rather than solely a cognitive reflective skill. Leadership development models must therefore incorporate embodied regulation practices as foundational mechanisms supporting inclusive relational outcomes.
Objective Integration: What mechanisms connect introspective awareness, autonomic regulation, and relational leadership effectiveness?	The thesis establishes a neuro-relational feedback loop in which introspective awareness enables autonomic regulation; autonomic regulation shapes relational signalling; relational signalling determines dyadic exchange quality; and relational outcomes reinforce reflective leadership practices over time.	Leadership effectiveness can be theoretically modelled as a multi-level regulatory system linking internal physiological states, reflective processes, and relational exchange structures, providing a new integrative explanatory framework for leadership scholarship.

5.7 Integrated Contributions to Knowledge

This thesis makes a set of integrated contributions to leadership scholarship that are conceptual, theoretical, methodological, and interdisciplinary in scope, collectively advancing leadership research beyond traditional behavioural and trait-based paradigms by positioning leadership effectiveness as an embodied, regulatory, and relationally enacted phenomenon. The central conceptual contribution of this study is the development of the neuro-relational model of introspective leadership, a framework that explicitly links introspective awareness, autonomic self-regulation, and leader–member relational exchange into a single explanatory architecture. Existing leadership literatures have typically examined reflective leadership processes, relational exchange quality, and neurobiological regulation as separate domains of inquiry; by integrating these domains, the present thesis clarifies how leaders’ internal physiological states function as mechanisms that translate reflective awareness into relational outcomes such as trust, psychological safety, and feedback receptivity. This reconceptualization advances leadership theory by reframing introspection as an embodied regulatory process rather than a purely cognitive reflective skill.

The thesis further extends Leader–Member Exchange (LMX) theory by introducing autonomic regulation as a previously under-theorised antecedent mechanism influencing dyadic exchange quality. While LMX research has consistently demonstrated that relational quality predicts critical organisational outcomes, the physiological processes through which leaders influence relational dynamics have remained largely unspecified. By integrating Polyvagal Theory into relational leadership theory, this study provides a biologically grounded explanation for how trust formation, relational attunement, and feedback reception emerge through processes of dyadic co-regulation, thereby contributing a mechanism-level theoretical bridge connecting neurophysiological regulation and relational leadership outcomes. In doing so, the thesis advances a more comprehensive explanation of leadership

effectiveness that incorporates physiological signalling processes alongside behavioural and cognitive leadership constructs.

Methodologically, the thesis demonstrates the application of a rigorous commentary-based synthesis approach to leadership theory development, combining PRISMA-guided corpus construction with Gioia-informed inductive concept structuring and abductive theoretical integration. This methodological design illustrates how systematic literature selection, structured conceptual coding, and transparent analytic documentation can be employed to construct defensible theory-building research even in the absence of primary empirical data, offering a replicable framework for interdisciplinary theory construction in emerging leadership domains where conceptual integration must precede empirical testing. Through this approach, the thesis contributes to methodological discussions concerning how qualitative conceptual synthesis can be conducted with procedural rigour comparable to empirical analytic designs. The research also establishes a formal interdisciplinary integration between affective neuroscience, leadership studies, and organisational relational theory by translating neurobiological regulatory constructs into leadership-relevant explanatory mechanisms. This integration expands the theoretical boundaries of leadership research and opens new pathways for empirical investigation at the intersection of physiology, cognition, and organisational behaviour, supporting the emergence of leadership science as a more biologically informed field capable of accounting for embodied regulatory processes that shape organisational interaction patterns.

In practical terms, the neuro-relational model provides a generative platform for future empirical research and leadership development innovation by specifying testable propositions concerning physiological synchrony, autonomic regulation training interventions, and the mediating role of interoceptive awareness in relational leadership effectiveness. These propositions establish a structured research agenda that can guide quantitative, qualitative, and mixed-methods investigations aimed at validating and extending

the model while also offering a scientifically grounded rationale for leadership development approaches that prioritise reflective awareness and physiological regulation as foundational competencies supporting relational leadership performance. Taken together, these contributions position the thesis not merely as a synthesis of existing knowledge but as a substantive theoretical advancement that reorients leadership scholarship towards an embodied, mechanism-based understanding of leadership effectiveness, providing a coherent foundation upon which the next generation of empirical, theoretical, and applied leadership studies can build.

In direct answer to the research questions that have animated this thesis: RQ1, How do leaders' neurophysiological states influence the quality of leader-member exchange?, is answered as follows: a leader's autonomic state, governed by the hierarchy specified in Polyvagal Theory, continuously transmits regulatory signals to followers through non-verbal neuroceptive channels. When the leader operates from a ventral vagal state, followers' nervous systems detect safety and activate their social engagement system, enabling the conditions for high-quality LMX. When the leader is sympathetically dysregulated, followers detect threat and activate defensive responses that erode trust and relational quality, regardless of the leader's behavioural intentions. RQ2, How can introspective leadership practices mediate the relationship between autonomic regulation and trust-centred outcomes?, is answered as follows: introspective practices that are somatically grounded, interoceptive awareness, breathwork, mindfulness, act as the leader's intervention point on the autonomic nervous system. By cultivating the capacity to recognise and regulate their physiological state, leaders can reliably access the ventral vagal configuration that enables neuroceptive safety, co-regulation, and the accumulation of high-quality LMX. Together, these answers constitute the thesis's central claim: that leadership effectiveness is physiological before it is

behavioural, and that the missing mechanism in the introspective leadership literature is the neurobiological substrate this thesis has named, specified, and theorised.

References

- Alo, O. and Arslan, A. (2022) 'The antecedents of leader-member exchange (LMX) relationships in African context: The influence of the supervisor's feedback delivery tactic', *International Journal of Organizational Analysis*, 30(7), pp. 67–94. Available at: <https://doi.org/10.1108/IJOA-07-2021-2878> (Accessed: 1 October 2025).
- Amanchukwu, R.N., Stanley, G.J. and Ololube, N.P. (2015) 'A review of leadership theories, principles and styles and their relevance to educational management', *Management*, 5(1), pp. 6–14. Available at: <https://doi.org/10.5923/j.mm.20150501.02> (Accessed: 1 October 2025).
- Arnsten, A.F.T. (2009) 'Stress signalling pathways that impair prefrontal cortex structure and function', *Nature Reviews Neuroscience*, 10(6), pp. 410–422. Available at: <https://doi.org/10.1038/nrn2648> (Accessed: 1 March 2026).
- Avolio, B.J. and Gardner, W.L. (2005) 'Authentic leadership development: Getting to the root of positive forms of leadership', *The Leadership Quarterly*, 16(3), pp. 315–338. Available at: <https://doi.org/10.1016/j.leaqua.2005.03.001> (Accessed: 1 October 2025).
- Beauchaine, T.P. (2015) 'Respiratory sinus arrhythmia: A transdiagnostic biomarker of emotion dysregulation and psychopathology', in Gross, J.J. (ed.) *The Oxford Handbook of Emotion Regulation*. Oxford: Oxford University Press. Available at: <https://doi.org/10.1093/oxfordhb/9780190689285.013.12> (Accessed: 24 February 2026).
- Boss, A.D. and Sims, H.P., Jr. (2008) 'Everyone fails! Using emotion regulation and self-leadership for recovery', *Journal of Managerial Psychology*, 23(2), pp. 135–150. Available at: <https://doi.org/10.1108/02683940810850781> (Accessed: 1 October 2025).

- Brazie, R. and Vanderpal, G. (2023a) *The steadfast leader: control anxiety, make confident decisions, and focus your team using the new science of leadership*. New York: McGraw Hill Professional.
- Brown, M.E. and Treviño, L.K. (2006) 'Ethical leadership: A review and future directions', *The Leadership Quarterly*, 17(6), pp. 595–616. Available at: <https://doi.org/10.1016/j.leaqua.2006.10.004> (Accessed: 1 October 2025).
- Carmeli, A. and Gittell, J.H. (2009) 'High-quality relationships, psychological safety, and learning from failures in work organizations', *Journal of Organizational Behavior*, 30(6), pp. 709–729. Available at: <https://doi.org/10.1002/job.565> (Accessed: 1 October 2025).
- Carmeli, A., Brueller, D. and Dutton, J.E. (2009) 'Learning behaviours in the workplace: The role of high-quality interpersonal relationships and psychological safety', *Systems Research and Behavioral Science*, 26(1), pp. 81–98. Available at: <https://doi.org/10.1002/sres.932> (Accessed: 1 March 2026).
- Coan, J.A. and Sbarra, D.A. (2015) 'Social baseline theory: The social regulation of risk and effort', *Personality and Social Psychology Review*, 19(4), pp. 384–409. Available at: <https://doi.org/10.1177/1088868315573125> (Accessed: 21 February 2026).
- Cornelissen, J. (2017) 'Developing propositions, a process model, or a typology? Addressing the challenges of writing theory without a boilerplate', *Academy of Management Review*, 42(1), pp. 1–9. Available at: <https://doi.org/10.5465/amr.2017.0001> (Accessed: 1 March 2026).
- Crotty, M. (1998) *The foundations of social research: meaning and perspective in the research process*. Thousand Oaks: SAGE Publications.
- Daudelin, M.W. (1996) 'Learning from experience through reflection', *Organizational Dynamics*, 24(3), pp. 36–48. Available at: [https://doi.org/10.1016/S0090-2616\(96\)90004-2](https://doi.org/10.1016/S0090-2616(96)90004-2) (Accessed: 1 October 2025).

- Davidson, R.J. and Begley, S. (2012) *The emotional life of your brain: How its unique patterns affect the way you think, feel, and live—and how you can change them*. New York: Hudson Street Press.
- Detert, J.R. and Burris, E.R. (2007) ‘Leadership behavior and employee voice: Is the door really open?’, *Academy of Management Journal*, 50(4), pp. 869–884. Available at: <https://doi.org/10.5465/amj.2007.26279183> (Accessed: 1 October 2025).
- Dulebohn, J.H., Bommer, W.H., Liden, R.C., Brouer, R.L. and Ferris, G.R. (2012) ‘A meta-analysis of antecedents and consequences of leader–member exchange: Integrating the past with an eye toward the future’, *Journal of Management*, 38(6), pp. 1715–1759. Available at: <https://doi.org/10.1177/0149206311415280> (Accessed: 21 February 2026).
- Edmondson, A.C. and Lei, Z. (2014) ‘Psychological safety: The history, renaissance, and future of an interpersonal construct’, *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), pp. 23–43. Available at: <https://doi.org/10.1146/annurev-orgpsych-031413-091305> (Accessed: 1 October 2025).
- Eisenberger, N.I. (2012) ‘The pain of social disconnection: Examining the shared neural underpinnings of physical and social pain’, *Nature Reviews Neuroscience*, 13(6), pp. 421–434. Available at: <https://doi.org/10.1038/nrn3231> (Accessed: 21 February 2026).
- Erdogan, B. and Bauer, T.N. (2015) ‘Leader–Member Exchange Theory’, in Wright, J.D. (ed.) *International Encyclopedia of the Social & Behavioral Sciences*. 2nd edn. Oxford: Elsevier, pp. 641–647. Available at: <https://doi.org/10.1016/B978-0-08-097086-8.22010-1> (Accessed: 24 February 2026).
- Farb, N.A.S., Segal, Z.V. and Mayberg, H. (2007) ‘Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reference’, *Social Cognitive and*

- Affective Neuroscience*, 2(4), pp. 313–322. Available at:
<https://doi.org/10.1093/scan/nsm030> (Accessed: 21 February 2026).
- Flores, P.J. and Porges, S.W. (2017) ‘Group psychotherapy as a neural exercise: Bridging polyvagal theory and attachment theory’, *International Journal of Group Psychotherapy*, 67(2), pp. 202–222. Available at:
<https://doi.org/10.1080/00207284.2016.1260469> (Accessed: 1 October 2025).
- Frazier, M.L., Fainshmidt, S., Klinger, R.L., Pezeshkan, A. and Vacheva, V. (2017) ‘Psychological safety: A meta-analytic review and extension’, *Personnel Psychology*, 70(1), pp. 113–165. Available at: <https://doi.org/10.1111/peps.12183> (Accessed: 1 October 2025).
- Gardner, W.L., Karam, E.P., Alvesson, M. and Einola, K. (2021) ‘Authentic leadership theory: The case for and against’, *The Leadership Quarterly*, 32(6), article 101495. Available at: <https://doi.org/10.1016/j.leaqua.2021.101495> (Accessed: 1 October 2025).
- Gioia, D.A., Corley, K.G. and Hamilton, A.L. (2013) ‘Seeking qualitative rigor in inductive research: Notes on the Gioia methodology’, *Organizational Research Methods*, 16(1), pp. 15–31. Available at: <https://doi.org/10.1177/1094428112452151> (Accessed: 21 February 2026).
- Gong, Y., Cheung, S-Y., Wang, M. and Huang, J-C. (2012) ‘Unfolding the proactive process for creativity: Integration of the employee proactivity, information exchange, and psychological safety perspectives’, *Journal of Management*, 38(5), pp. 1611–1633. Available at: <https://doi.org/10.1177/0149206310380250> (Accessed: 1 October 2025).
- Graen, G.B. and Uhl-Bien, M. (1995) ‘Relationship-based approach to leadership: Development of Leader-Member Exchange (LMX) theory over 25 years’, *The Leadership Quarterly*, 6(2), pp. 219–247. Available at: [https://doi.org/10.1016/1048-9843\(95\)90036-5](https://doi.org/10.1016/1048-9843(95)90036-5).

- Grossman, P. (2023) ‘Fundamental challenges and likely refutations of the five basic premises of polyvagal theory’, *Biological Psychology*, 180, article 108589. Available at: <https://doi.org/10.1016/j.biopsycho.2023.108589> (Accessed: 24 February 2026).
- Guba, E.G. and Lincoln, Y.S. (1994) ‘Competing paradigms in qualitative research’, in Denzin, N.K. and Lincoln, Y.S. (eds.) *Handbook of qualitative research*. Thousand Oaks: SAGE Publications, pp. 105–117.
- Gustafson, L.P., Short, A.K. and Hamilton, N.W. (2022) ‘Teaching and assessing active listening as a foundational skill for lawyers as leaders, counselors, negotiators, and advocates’, *Santa Clara Law Review*, 62(1), pp. 1–30. Available at: <https://digitalcommons.law.scu.edu/lawreview/vol62/iss1/2> (Accessed: 1 October 2025).
- Hairston, L. (2021) *The recipe of me: Developing your personal mission statement*. Unpublished presentation.
- Hartung, P. (2020) ‘The impact of self-awareness on leadership behavior’, *Journal of Applied Leadership and Management*, 8, pp. 1–21. Available at: <https://www.journal-alm.org/article/view/2106> (Accessed: 1 October 2025).
- Hölzel, B.K., Lazar, S.W., Gard, T., Schuman-Olivier, Z., Vago, D.R. and Ott, U. (2011) ‘How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective’, *Perspectives on Psychological Science*, 6(6), pp. 537–559. Available at: <https://doi.org/10.1177/1745691611419671> (Accessed: 21 February 2026).
- Hostinar, C.E., Sullivan, R.M. and Gunnar, M.R. (2014) ‘Psychobiological mechanisms underlying the social buffering of the hypothalamic–pituitary–adrenocortical axis: A review of animal models and human studies’, *Developmental Psychobiology*, 56(5), pp. 843–860. Available at: <https://doi.org/10.1002/dev.21226> (Accessed: 21 February 2026).

- Innovative Human Capital (2024) *Leveraging Polyvagal Theory, neuroception, and interoception for enhanced executive leadership*. Available at: <https://www.innovativehumancapital.com> (Accessed: 1 October 2025).
- Jabareen, Y. (2009) 'Building a conceptual framework: philosophy, definitions, and procedure', *International Journal of Qualitative Methods*, 8(4), pp. 49–62. Available at: <https://doi.org/10.1177/160940690900800406> (Accessed: 24 February 2026).
- Johnson, N.N. (2023) 'Leadership in action: An introspective reflection', in Johnson, N.N. (ed.) *Leadership in action*. Hershey: IGI Global, pp. 43–57. Available at: <https://doi.org/10.4018/978-1-6684-8822-5.ch003> (Accessed: 1 October 2025).
- Kamiya, M. (1966) *Ikigai ni tsuite [On the meaning of life]*. Tokyo: Misuzu Shobo.
- Kark, R. and Carmeli, A. (2009) 'Alive and creating: The mediating role of vitality and aliveness in the relationship between psychological safety and creative work involvement', *Journal of Organizational Behavior*, 30(6), pp. 785–804. Available at: <https://doi.org/10.1002/job.571> (Accessed: 1 October 2025).
- Kegan, R. and Lahey, L.L. (2016) *Immunity to change: How to overcome it and unlock potential in yourself and your organization*. Boston: Harvard Business Review Press.
- Kolacz, J., Dale, L.P., Nix, E.J., Roath, O.K., Lewis, G.F. and Porges, S.W. (2019) 'Adverse childhood experiences and autonomic regulation: Exploring polyvagal theory', *Child Abuse & Neglect*, 92, pp. 28–38. Available at: <https://doi.org/10.1016/j.chiabu.2019.03.008> (Accessed: 1 October 2025).
- Laborde, S., Mosley, E. and Thayer, J.F. (2017) 'Heart rate variability and cardiac vagal tone in psychophysiological research – Recommendations for experiment planning, data analysis, and data reporting', *Frontiers in Psychology*, 8, article 213. Available at: <https://doi.org/10.3389/fpsyg.2017.00213> (Accessed: 1 March 2026).
- Leroy, H., Anseel, F., Gardner, W.L. and Sels, L. (2015) 'Authentic leadership, authentic followership, basic need satisfaction, and work role performance: A cross-level

- study', *Journal of Management*, 41(6), pp. 1677–1697. Available at: <https://doi.org/10.1177/0149206312457822> (Accessed: 21 February 2026).
- Liang, J., Farh, C.I.C. and Farh, J.L. (2012) 'Psychological antecedents of promotive and prohibitive voice: A two-wave examination', *Academy of Management Journal*, 55(1), pp. 71–92. Available at: <https://doi.org/10.5465/amj.2010.0176> (Accessed: 1 October 2025).
- Molenberghs, P., Prochilo, G., Steffens, N.K., Zacher, H. and Haslam, S.A. (2017) 'The neuroscience of inspirational leadership: The importance of collective-oriented language and shared group membership', *Trends in Cognitive Sciences*, 21(11), pp. 798–801. Available at: <https://doi.org/10.1016/j.tics.2017.08.009> (Accessed: 1 October 2025).
- Nembhard, I.M. and Edmondson, A.C. (2006) 'Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams', *Journal of Organizational Behavior*, 27(7), pp. 941–966. Available at: <https://doi.org/10.1002/job.413> (Accessed: 1 October 2025).
- Owens, B.P. and Hekman, D.R. (2012) 'Modeling how to grow: An inductive examination of humble leader behaviors, contingencies, and outcomes', *Academy of Management Journal*, 55(4), pp. 787–818. Available at: <https://doi.org/10.5465/amj.2010.0441> (Accessed: 1 October 2025).
- Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., Shamseer, L., Tetzlaff, J.M., Akl, E.A., Brennan, S.E., Chou, R., Glanville, J., Grimshaw, J.M., Hróbjartsson, A., Lalu, M.M., Li, T., Loder, E.W., Mayo-Wilson, E., McDonald, S., McGuinness, L.A., Stewart, L.A., Thomas, J., Tricco, A.C., Welch, V.A., Whiting, P. and Moher, D. (2021) 'The PRISMA 2020 statement: An updated guideline for reporting systematic reviews', *BMJ*, 372, n71. Available at: <https://doi.org/10.1136/bmj.n71> (Accessed: 21 February 2026).

- Porges, S.W. (2018) 'Polyvagal Theory: A primer', in Dana, D. (ed.) *Clinical applications of the Polyvagal Theory*. New York: W. W. Norton & Company, pp. 50–69.
- Rao, P.B., Inampudi, P., Meegada, V.B. and Sathyanarayana, N. (2024) 'The application of neuroscience in leadership development', in Saluja, S., Kukreja, J. and Sharma, S. (eds.) *Building organizational resilience with neuroleadership*. Hershey: IGI Global, pp. 113–129. Available at: <https://doi.org/10.4018/979-8-3693-1785-3.ch008> (Accessed: 1 October 2025).
- Reb, J., Narayanan, J. and Ho, Z.W. (2015) 'Mindfulness at work: Antecedents and consequences of employee awareness and absent-mindedness', *Mindfulness*, 6(1), pp. 111–122. Available at: <https://doi.org/10.1007/s12671-013-0236-4> (Accessed: 21 February 2026).
- Rock, D. (2008) 'SCARF: A brain-based model for collaborating with and influencing others', *NeuroLeadership Journal*, 1, pp. 44–52. Available at: <https://neuroleadership.com/research-and-library/scarf-a-brain-based-model-for-collaborating-with-and-influencing-others> (Accessed: 21 February 2026).
- Senior, C., Lee, N. and Butler, M.J. (2011) 'Organizational cognitive neuroscience', *Organization Science*, 22(3), pp. 804–815. Available at: <https://doi.org/10.1287/orsc.1100.0532> (Accessed: 1 October 2025).
- Sparrowe, R.T. and Liden, R.C. (2005) 'Two routes to influence: Integrating leader–member exchange and social network perspectives', *Administrative Science Quarterly*, 50(4), pp. 505–535. Available at: <https://doi.org/10.2189/asqu.50.4.505> (Accessed: 24 February 2026).
- Tang, Y-Y., Hölzel, B.K. and Posner, M.I. (2015) 'The neuroscience of mindfulness meditation', *Nature Reviews Neuroscience*, 16(4), pp. 213–225. Available at: <https://doi.org/10.1038/nrn3916> (Accessed: 21 February 2026).

- Torraco, R.J. (2005) 'Writing integrative literature reviews: Guidelines and examples', *Human Resource Development Review*, 4(3), pp. 356–367. Available at: <https://doi.org/10.1177/1534484305278283> (Accessed: 24 February 2026).
- Tranfield, D., Denyer, D. and Smart, P. (2003) 'Towards a methodology for developing evidence-informed management knowledge by means of systematic review', *British Journal of Management*, 14(3), pp. 207–222. Available at: <https://doi.org/10.1111/1467-8551.00375> (Accessed: 21 February 2026).
- Vanderpal, G. and Brazie, R. (2022a) 'Exploratory study of polyvagal theory and underlying stress and trauma that influence major leadership approaches', *Journal of Applied Business and Economics*, 24(1). Available at: <https://doi.org/10.33423/jabe.v24i1.5044> (Accessed: 1 October 2025).
- Vanderpal, G. and Brazie, R. (2022b) 'Influence of basic human behaviors (influenced by brain architecture and function), and past traumatic events on investor behavior and financial bias', *Journal of Accounting and Finance*, 22(2), pp. 33–53. Available at: <https://doi.org/10.33423/jaf.v22i2.5137> (Accessed: 1 October 2025).
- Vanderpal, G. and Brazie, R. (2022c) 'The impact of underlying stress and trauma on HRM recruitment and selection bias in employee interviews', *Journal of Leadership Accountability and Ethics*, 19(2), pp. 88–109. Available at: <https://doi.org/10.33423/jlae.v19i2.5111> (Accessed: 1 October 2025).
- Vanderpal, G. and Brazie, R. (2023b) 'Exploration of how polyvagal theory and autonomic nervous system impact organizational performance through reduced employee turnover and improved work culture', *Journal of Strategic Innovation and Sustainability*, 18(3). Available at: <https://doi.org/10.33423/jsis.v18i3.6528> (Accessed: 1 October 2025).

- Vanderpal, G. and Brazie, R. (2024) 'Integrating polyvagal theory with agile project management', *Journal of Organizational Psychology*, 24(1). Available at: <https://doi.org/10.33423/jop.v24i1.6862> (Accessed: 1 October 2025).
- Waldman, D.A., Balthazard, P.A. and Peterson, S.J. (2011) 'Social cognitive neuroscience and leadership', *The Leadership Quarterly*, 22(6), pp. 1092–1106. Available at: <https://doi.org/10.1016/j.leaqua.2011.09.005> (Accessed: 1 October 2025).
- Walumbwa, F.O., Avolio, B.J., Gardner, W.L., Wernsing, T.S. and Peterson, S.J. (2011) 'Linking ethical leadership to employee performance: The roles of leader–member exchange, self-efficacy, and organizational identification', *Organizational Behavior and Human Decision Processes*, 115(2), pp. 204–213. Available at: <https://doi.org/10.1016/j.obhdp.2010.11.002> (Accessed: 1 October 2025).
- Watts, G. (2012) 'The power of introspection for executive development', *The Psychologist-Manager Journal*, 15(3), pp. 206–224. Available at: <https://doi.org/10.1080/10887156.2012.701136> (Accessed: 1 October 2025).
- Woelfel, W. (2024) 'Introspective creativity: Leveraging inclusive leadership philosophy with design thinking methodologies', *The Human Side of Service Engineering*, 143, pp. 235–242. Available at: <https://doi.org/10.54941/ahfe1005103> (Accessed: 1 October 2025).
- Zak, P.J. (2017) 'The neuroscience of trust', *Harvard Business Review*, (January–February). Available at: <https://hbr.org/2017/01/the-neuroscience-of-trust> (Accessed: 21 February 2026).