CONCEPTUALISING AUTHENTIC MILITARY LEADERSHIP FOR ADAPTIVE DECISION-MAKING IN VOLATILE, UNCERTAIN, COMPLEX, AND AMBIGUOUS ENVIRONMENTS

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Abstract

Contemporary military operations in contested, multi-domain environments demand leadership frameworks that integrate ethical discipline with operational agility. This study synthesises authentic leadership theory with adaptive decision-making doctrinal frameworks to address a significant theoretical gap: the absence of a unified model linking relational and moral authenticity to accelerated decision cycles within volatile, uncertain, complex, and ambiguous (VUCA) contexts.

Through systematic integration of peer-reviewed scholarship (2010–2025), NATO doctrinal guidance, and empirical research on leadership resilience and simulation-enabled training, the researcher develop the Integrated Authentic–Adaptive Leadership Model (IAALM). The analysis reveals that core authentic behaviours - principled transparency, balanced information processing, and relational clarity - serve as catalysts for decentralised initiative and rapid learning cycles characteristic of mission command. Three mediating mechanisms - psychological safety, interpersonal trust, and shared operational understanding - constitute the pathway through which moral anchoring translates into tactical tempo without eroding legal-ethical compliance.

The IAALM demonstrates that units cultivating psychological safety and trust relationships achieve faster situational understanding and disciplined risk calibration under uncertainty. Institutionalisation mechanisms include doctrine-aligned training methodologies, mentorship frameworks, structured reflection cycles, and extended-reality (XR) simulations. The model provides scalable policy guidance for NATO and national militaries seeking to prepare leaders who sustain both ethical resilience and decision velocity in contemporary operational contexts.

Keywords

Authentic leadership; Mission command; Adaptive decision-making; VUCA; NATO doctrine; Psychological safety; XR training; Resilience.

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Introduction
Contemporary military operations have undergone a fundamental change in character. The emergence of hybrid warfare, the compression of decision-making cycles, and the necessity for cross-domain coordination have exposed critical limitations in leadership paradigms designed for linear, predictable operational environments. Within this context, the concept of volatility, uncertainty, complexity, and ambiguity - hereafter VUCA - has transcended theoretical abstraction to become a governing lens in military planning, doctrine development, and leader education at both NATO and national levels. This operational reality, however, generates a pressing scholarly and professional challenge: existing leadership frameworks tend to compartmentalise the imperatives of ethical integrity and decision velocity as competing demands rather than mutually reinforcing capacities.

The NATO Strategic Concept (2022) and the NATO Warfighting Capstone Concept (2021) establish the strategic imperative. Both documents formalise the contested character of contemporary strategic environments - encompassing cyber, space, and hybrid dimensions - and emphasise that operational success hinges upon alliance-wide adaptability, resilience, and cross-domain synchronisation. National defence establishments have developed analogous priorities. The U.S. Army's foundational doctrine on Mission Command (ADP 6-0, 2019) operationalises adaptability through decentralised authority exercised within the commander's intent, disciplined initiative at the lowest competent echelon, and calibrated risk acceptance. The United Kingdom's Defence Doctrine (JDP 0-01, 2022) formalises comparable principles governing the employment of military instruments within integrated governmental and allied partnership frameworks. These doctrinal evolutions reflect a consensus: leaders must act faster than adversaries while maintaining legal-ethical guardrails and organisational cohesion.

Yet contemporary leadership scholarship presents a theoretical tension. Authentic leadership - grounded in balanced information processing, relational transparency, internalised moral perspective, and heightened self-awareness - has demonstrated robust associations with well-being, voice behaviour, and constructive initiative in high-pressure organisational contexts. These mechanisms operate through the cultivation of psychological safety, quality leader-member exchange, and identification with leaders who embody principled consistency. However, authentic leadership research has predominantly centred on civilian organisational settings, and its application to military contexts characterised by extreme temporal pressure, incomplete information, and life-or-death decisions remains conceptually underdeveloped. Conversely, military adaptive decision-making literature - encompassing mission command, sensemaking under stress, and resilience engineering - addresses tempo and operational effectiveness but has not systematically integrated the relational and moral dimensions that authentic leadership research identifies as foundational to sustained performance and organisational legitimacy.

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*Conceptualising authentic military leadership for adaptive decision-making
in volatile, uncertain, complex, and ambiguous environments*

This scholarly gap generates the research objectives that structure this investigation. The overarching aim is to develop and validate a theoretical model that synthesises authentic leadership theory with adaptive decision-making practices, demonstrating how moral clarity and relational trust operationalise as mechanisms that enable both decentralised initiative and ethical compliance within VUCA operational environments. To operationalise this aim, the study is guided by the following research questions and propositions.

First, how do the core dimensions of authentic leadership - self-awareness, relational transparency, balanced processing, and moral perspective - map onto the specific demands imposed by VUCA contexts? This question investigates whether authentic leadership behaviours possess differential utility across the four VUCA dimensions (volatility, uncertainty, complexity, ambiguity), or whether they function as generalised capacities that enhance leader effectiveness across all VUCA-related stressors. The underlying proposition is that authentic leadership does not constitute a unitary construct with uniform effects, but rather comprises distinct behavioural and cognitive components that address specific operational threats: transparency and calm communication stabilise affect under volatility; ethical clarity and trust-building reduce anxiety and enable candid risk reporting under uncertainty; open inquiry and integrated perspective-taking support sensemaking amid complexity; and self-awareness regarding cognitive bias anchors decision-making under ambiguous signals.

Second, what enabling mechanisms translate authentic leadership attributes into accelerated decision cycles and disciplined initiative characteristic of adaptive decision-making practices such as mission command? This research question addresses the intermediate processes through which moral and relational capacities produce observable changes in decision tempo and organisational behaviour. The theoretical proposition here is that psychological safety, interpersonal trust, and shared operational understanding function as mediating pathways. Psychological safety - the degree to which team members perceive it as normatively permissible to speak candidly about risks, errors, and uncertainties - emerges when leaders demonstrate authentic transparency and balanced processing. Trust, grounded in perceived consistency between leaders' stated values and observed actions, amplifies the willingness of subordinates to exercise disciplined initiative without seeking excessive authorisation. Shared operational understanding, built through iterative cycles of transparent communication and collaborative sensemaking, accelerates decision cycles by reducing information asymmetries and enabling rapid re-planning at lower echelons.

Third, to what extent can these mediating mechanisms be institutionalised through doctrine-consistent training, mentorship architectures, structured reflection practices, and immersive simulation technologies? This operationalisation question addresses the practitioner domain: does the model generate actionable pathways for military organisations seeking to cultivate authentic-adaptive leadership at scale? The associated hypothesis is that systematic exposure to deliberately-designed interventions - including guided self-reflection on moral foundations, scenario-based exercises that force rapid delegation within commander's intent, mentorship chains that model and reinforce authentic behaviour, structured after-action reviews that consolidate iterative learning, and XR simulations that compress experience and enable safe repetition of high-tempo

decision cycles - will produce measurable improvements in leader authenticity, team psychological safety, decision speed, ethical compliance, and operational cohesion.

By integrating responses to these interconnected research questions, the present study develops the Integrated Authentic–Adaptive Leadership Model (IAALM), which articulates how authentic leadership capacities and adaptive decision-making practices co-constitute an emergent system of leadership effectiveness calibrated to VUCA environments. The model identifies VUCA inputs and operational frictions as the context; maps authentic leadership behaviours and adaptive tactics to specific VUCA dimensions; specifies psychological safety, trust, and shared understanding as critical mediators; and delineates institutional mechanisms (training, mentorship, reflection, simulation) through which the model can be operationalised in military organisations. In so doing, the study contributes to military leadership scholarship by providing a theoretically coherent and practically actionable framework that resolves the apparent tension between ethical grounding and operational velocity - demonstrating, instead, that these dimensions are mutually reinforcing when appropriately conceptualised and institutionalised.

The remainder of this article proceeds as follows. This article presents a consolidated literature review that traces VUCA's evolution in military doctrine, examines authentic leadership theory and its operational relevance, synthesises research on adaptive decision-making practices and resilience, and reviews emerging evidence on mentorship and immersive simulation technologies. This study constitutes the analytical core, presenting the VUCA-to-authentic-behaviour mapping (Table 1), detailing the IAALM architecture (Figure 1), and discussing illustrative case applications. The article translates findings into practical implications for doctrine-aligned leader development, assessment methodologies, and NATO/national policy guidance. The study addresses limitations of the conceptual synthesis approach and identifies promising directions for empirical validation. This article concludes by restating the significance of the model for contemporary military leadership challenges.

1. Review of the scientific literature
1.1 VUCA and contemporary doctrine

VUCA has moved beyond metaphor, informing doctrine and leader development. Bennett and Lemoine's (2014) seminal contribution clarified that each VUCA dimension creates distinct managerial/operational threats requiring tailored responses. NATO's 2022 Strategic Concept formalises the contested strategic environment (including cyber and space) and prioritises resilience and interoperability, while the NWCC (2021) frames an Alliance-wide vision to maintain a decisive advantage to 2040, underscoring adaptation in force development and C2/Command and Control.

Across NATO and allied nations, defence doctrinal frameworks demonstrate substantial alignment regarding how military organisations should institutionalise adaptive decision-making within VUCA-characterised operational environments. The U.S. Army's foundational doctrine on Mission Command (ADP 6-0, 2019) operationalises this institutionalisation through three constitutive principles: explicit articulation of the commander's intent as the conceptual framework enabling subordinate decision-making, systematic delegation of execution authority to lower echelons, and formalised

acceptance of defined risk parameters. Correspondingly, the United Kingdom's Defence Doctrine (JDP 0-01, 2022) establishes comparable prescriptive requirements, specifying doctrinal principles that govern the deployment of military capabilities within integrated governmental structures and multinational alliance contexts. Rather than permitting individual leaders discretionary latitude in interpreting adaptive leadership, these doctrinal instruments institutionalise adaptive practices as formal organisational requirements, thereby converting leadership principles into binding expectations that define permissible decision-making behaviours across military hierarchies.

1.2 Authentic leadership under operational stress

Post-2010 studies associate authentic leadership with well-being, voice and constructive performance via mechanisms such as attachment security, identification with leader and high-quality leader-member exchange (Rahimnia and Sharifirad, 2014; Khan et al., 2021). Its military relevance is twofold. First, authentic leaders generate psychological safety, enabling candid reporting of risk and rapid error-correction - crucial under uncertainty. A second critical military function served by authentic leadership concerns sustaining institutional and operational legitimacy under conditions of ethical pressure. When operational ambiguity creates incentives for expedient deviation from established norms - such as circumventing law-of-armed-conflict requirements or relaxing Rules of Engagement compliance - authentic leaders' demonstrated internalised moral perspective functions to institutionalise ethical boundaries as non-negotiable organisational standards rather than contextually flexible constraints. While organisational psychology research on authentic leadership has not focused exclusively on military contexts, the mechanism through which authenticity produces enhanced compliance - specifically, the transparent communication of values and consistent alignment between leadership actions and stated principles - proves congruent with military doctrine requirements for disciplined initiative grounded in shared understanding of intent and ethical constraints (Rahimnia & Sharifirad, 2014; Khan et al., 2021).

However, the military applicability of authentic leadership requires critical qualification regarding contextual conditions. Authentic transparency functions optimally within contexts permitting open communication and intellectual exchange - such as planning phases, training environments, and operational contexts characterised by moderate time pressure. Under conditions of extreme operational stress (imminent threat, high casualties, severe resource constraints) or during crisis decision-making requiring rapid response, excessive leader self-disclosure regarding personal uncertainty may undermine subordinate confidence in leadership judgment and organisational cohesion. Research on leadership in VUCA contexts increasingly emphasises that authentic leadership effectiveness depends upon context-sensitive calibration (Wilson, 2023): leaders must balance relational transparency regarding organisational challenges with sufficient confidence projection to maintain institutional stability. This distinction suggests that authentic leadership should not be conceptualised as a universalised prescriptive model applied uniformly across all operational contexts, but rather as a context-sensitive approach requiring continuous recalibration based on operational demands and threat levels.

1.3 Adaptive decision-making: mission command, sensemaking and cognitive load

Empirical work demonstrates that simulated military operational stress degrades cognition yet that adaptive decision-making - supported by resilience and fitness - buffers performance effects (Sekel et al., 2023). This aligns with doctrine that operationalises adaptivity through mission command: decentralising authority within commander's intent, privileging initiative at the lowest competent echelon and enabling rapid re-planning. Joint and service doctrine (Joint Publication/JP, Army Doctrine Publication/ADP, Air Force Doctrine Publication/AFDP) further translates adaptivity into joint campaigning and all-domain integration. (Air Force Doctrine Publication 3.0, 2025; ADP 6-0, 2019; Joint Publications Operations Series, 2019).

Sustained adaptive decision-making under VUCA conditions depends upon resilience functioning as a foundational individual and organisational capacity. Research on psychological responses to operational stress reveals that the critical mechanism linking individual resilience to maintained adaptive performance involves self-regulation: the capacity to modulate emotional and cognitive responses despite adversity-induced stress enables personnel to maintain decision-making quality across extended operations characterised by uncertainty, incomplete information, and compressed decision cycles (McLarnon et al., 2021). This self-regulation capacity proves operationally critical because VUCA contexts demand not merely initial adaptive responses but rather sustained adaptive performance - the ability to continue adjusting decisions and approaches despite accumulating fatigue, stress, and psychological pressure.

The operationalisation of resilience as an institutionalised military capacity, however, requires moving beyond individual skill development to systematic programme design grounded in stress-and-coping theory. Research examining U.S. military resilience programmes emphasises that resilience constitutes an organisationally trainable competency provided interventions employ evidence-based design principles and become embedded within unit culture through routine practice (McInerney et al., 2022). This institutional embedding proves essential because isolated resilience training - instruction delivered without ongoing unit-level reinforcement - produces temporary improvements that decay when personnel return to organisational contexts lacking systematic support for sustained stress management. Rather, resilience emerges as a durable organisational capacity when training becomes integrated into routine unit operations, when peer support networks institutionalise collective stress management, and when leadership explicitly models the self-regulation and adaptive coping practices being taught. This integration of individual-level resilience training with unit-level cultural support structures creates conditions enabling distributed adaptive decision-making across formations operating under extreme stress.

1.4 Mentorship, coaching and leader development

Beyond courses and checklists, sustained mentorship and coaching shape ethical judgment and decision tempo. A policy brief from Queen's University's CIDP argues for structured mentorship architectures in formations to support talent management and accelerate learning cycles; this sits comfortably with NATO's and national militaries' emphasis on professional mastery and mission command (Meumann and O'Neil, 2020).

1.5 Simulation, virtual and extended reality for decision agility

Extended-reality simulations constitute an effective training technology for military decision-making development when designed according to specific pedagogical principles grounded in cognitive learning theory. The operative mechanism through which XR environments enhance decision-making capacity involves experiential compression: scenarios can concentrate multiple high-tempo decision cycles and cross-domain coordination challenges into compressed timeframes, enabling personnel to achieve experiential density that would require substantially longer periods to acquire through operational exposure. However, simulation training effectiveness depends not upon graphical realism or terrain fidelity but rather upon scenario design that targets the specific cognitive and interpersonal processes required for effective decision-making. Boyce et al. (2022) demonstrate empirically that terrain fidelity and visual detail, while superficially enhancing simulation immersion, can actually degrade learning outcomes if they consume attentional resources that should be directed toward decision reasoning and situational sensemaking. This finding reflects cognitive load theory principles: when scenario visuals demand excessive attentional processing, mental capacity is diverted from the decision-making processes the training intends to develop.

Systematic evidence from VR training studies indicates that XR simulations produce measurable improvements in tactical and combat decision-making when scenario design aligns explicitly with learning objectives and incorporates mechanisms supporting knowledge transfer (Steven et al., 2023). Specifically, training effectiveness requires that scenarios present decision problems requiring the same cognitive processes as operational decision-making, that feedback regarding decisions be provided in real-time within simulation, and that the training integrate with structured reflection and coaching enabling personnel to translate simulation experience into refined decision approaches. Research on military leadership development demonstrates that junior leader development through virtual simulations succeeds when simulation-based practice is embedded within mentoring relationships that facilitate metacognitive reflection on decision reasoning (Elkington et al., 2024). In this integration model, simulation provides the experiential opportunity and distributed practice enabling rapid development of decision-making capabilities, while mentorship and structured after-action review create the reflective space enabling translation of simulation experience into sustained improvements in operational decision-making quality and speed.

2. Research methodology
2.1. Research Design and Epistemological Positioning

This investigation employs conceptual synthesis as its primary methodological approach. Conceptual synthesis constitutes an appropriate research design for theory-building in problem domains where existing scholarship remains fragmented across disciplines, where practical challenges outpace theoretical integration, and where the objective is to develop actionable frameworks rather than aggregate quantitative findings or assess intervention efficacy. The three research questions guiding this study - concerning the mapping of authentic leadership dimensions to VUCA contexts, the identification of mediating mechanisms linking authenticity to adaptive decision-making, and the specification of institutional pathways for model operationalisation -

explicitly require the integration of authentic leadership scholarship (organisational psychology, management studies), adaptive decision-making research (military science, cognitive psychology), and doctrinal analysis (NATO and national defence policy). No single discipline or methodological tradition addresses all three domains with equal depth. Conceptual synthesis, accordingly, provides a structured approach to bridging these domains by identifying convergent themes, mapping conceptual homologies, and constructing a coherent integrative framework grounded in evidence from multiple epistemic communities.

2.2. Documentary Sources and Selection Protocol

The study draws upon a curated documentary corpus spanning three primary source categories: peer-reviewed academic scholarship, official military doctrine, and empirical/experimental research. The temporal window for source inclusion was established as 2010–2025, a span capturing the emergence and consolidation of VUCA as a governing concept in military planning (following Bennett and Lemoine's 2014 seminal contribution) and encompassing contemporary scholarship on authentic leadership, adaptive decision-making, resilience, and simulation-enabled leader development. This timeframe ensures inclusion of foundational theoretical work alongside recent advances in neurocognitive research, XR technologies, and doctrine-informed practice.

Peer-reviewed sources were identified through systematic searching within academic databases, including JSTOR, ProQuest, and publisher platforms serving military studies and organisational psychology (Taylor & Francis, SAGE, Springer). Search protocols combined primary terminology ("authentic leadership", "adaptive decision-making", "VUCA", "mission command", "psychological safety", "resilience", "military leadership") with military-specific variations ("command and control", "leader development", "operational stress", "tactical decision-making"). Official doctrine sources encompassed NATO capstone and strategic documents (NATO Strategic Concept 2022, NATO Warfighting Capstone Concept 2021) and national defence doctrine publications from the United States (ADP 6-0 Mission Command, ADP 6-22 Army Leadership and the Profession, both 2019) and the United Kingdom (JDP 0-01 UK Defence Doctrine, 2022). These institutional sources were accessed through official government repositories and NATO publications portals to ensure authoritative versions. Empirical and experimental studies - addressing leadership interventions, resilience training, simulation-based learning, and stress-induced cognitive performance - were drawn from peer-reviewed journals specialising in military psychology, occupational health, human factors, and emerging technologies.

Source selection followed three operationalised criteria for inclusion. First, sources required an explicit substantive connection to military leadership, military decision-making processes, or decision-making under operational stress. Sources addressing authentic leadership or adaptive decision-making exclusively in civilian organisational contexts were included only if their theoretical mechanisms or empirical findings demonstrated direct relevance to high-stakes, time-pressured decision environments. Second, the included sources had to offer content analytically usable for mapping to VUCA dimensions or for identifying mechanisms linking leadership behaviours to

decision-making outcomes. This criterion excluded generic leadership literature lacking specificity regarding uncertainty, complexity, or temporal pressure. Third, peer-reviewed sources were subject to quality assessment through standard indicators: publication venue prestige, author expertise in relevant domains, citation impact, and methodological rigour (for empirical studies). Doctrine sources were accepted as authoritative institutional statements reflecting contemporary alliance and national policy.

2.3. Analytical Stages and Coding Procedures

The analysis proceeded through three interconnected stages, each building upon the outputs of preceding phases.

Stage 1: Thematic Coding of Authentic Leadership Attributes and Adaptive Competencies. The researcher conducted thematic coding of authentic leadership literature to identify and consolidate core behavioural, cognitive, and relational attributes. Authentic leadership scholarship, while conceptually coherent, employs varying terminology and emphasises different dimensions across authors. Initial coding identified the four primary dimensions consistently highlighted across peer-reviewed sources: self-awareness (understanding one's strengths, limitations, biases, and values), relational transparency (communicating honestly and avoiding deceptive or manipulative behaviour), balanced processing (soliciting diverse viewpoints, genuinely considering contrary information, and avoiding defensive bias), and internalised moral perspective (acting in accordance with internalised ethical standards rather than external pressures or approval-seeking). Simultaneously, adaptive decision-making literature was examined to extract core competencies and tactical practices. This second coding stream identified recurring themes: mission command (decentralised authority exercised within commander's intent), cognitive agility (the capacity to rapidly recalibrate mental models in response to new information), systems thinking (understanding interdependencies and second-order effects across domains), iterative decision cycles (structured processes of observation, orientation, decision, and action), psychological safety (creating conditions permitting candid risk reporting and error acknowledgment), and resilience (the capacity to sustain performance under adversity). These two coding streams - authentic leadership attributes and adaptive competencies - were maintained as distinct analytical entities to facilitate precise mapping in Stage 2.

Stage 2: Cross-Mapping Authentic Leadership to VUCA Dimensions. The second analytical stage proceeded by systematically examining how each authentic leadership attribute addresses the specific operational demands posed by individual VUCA dimensions. VUCA was disaggregated into its four constituent elements following Bennett and Lemoine's (2014) clarification: volatility (rapid environmental change, unpredictable events), uncertainty (lack of information about causes, effects, or future trajectories), complexity (multifaceted problems with interdependencies and non-linear dynamics), and ambiguity (equivocal signals permitting multiple interpretations without clear cause-and-effect relationships). For each VUCA dimension, the researcher examined how authentic leadership attributes and adaptive competencies manifested operationally. For example, under volatility, relational transparency and consistent calm communication function to stabilise affect, reduce panic-driven decision-making, and

maintain organisational cohesion during rapid environmental shifts. Under uncertainty, ethical clarity and trust-building reduce information anxiety, enable candid reporting of gaps and risks, and permit faster decision-making with incomplete data. Under complexity, balanced processing and open inquiry support collaborative sensemaking, integration of diverse expertise, and development of shared operational pictures. Under ambiguity, self-awareness regarding cognitive bias anchors decision-making when multiple interpretations are equally plausible, preventing reflexive adherence to prior beliefs. This cross-mapping is presented in Table 1, which constitutes a synthesised matrix translating abstract constructs into contextualised operational behaviours.

Stage 3: Construction of the IAALM, Identification of Mediating and Enabling Mechanisms. The third analytical stage involved theoretical synthesis to construct an integrative model articulating how authentic leadership and adaptive decision-making co-constitute an emergent leadership system. The synthesis proceeded by positing VUCA inputs and operational frictions as the contextual stimulus; mapping authentic leadership behaviours and adaptive tactics to specific VUCA dimensions as primary response systems; and identifying intermediary mechanisms through which these primary systems produce observable improvements in decision quality, tempo, and ethical compliance. Mediating mechanisms were identified through examination of social-psychological and organisational research linking leader authenticity to follower behaviour. The evidence converged on three primary mediators: psychological safety (the degree to which team members perceive normative permission to speak candidly about risks and errors), interpersonal trust (perceived consistency between stated values and observable actions, combined with benevolence and competence attributions), and shared operational understanding (iteratively constructed, distributed knowledge of the situation, objectives, and interdependencies across echelons). Enabling mechanisms - institutional practices and technologies through which the model can be operationalised at scale - were identified through examination of military training doctrine, mentorship research, after-action review literature, and simulation technology studies. Five enabling mechanisms emerged: structured mentorship architectures (formalised coaching chains facilitating authentic leadership modelling and development), scenario-based exercises (deliberate practice within realistic decision-making scenarios that force rapid delegation and risk calibration), structured after-action reviews (reflective practice cycles consolidating learning and reinforcing psychological safety), XR simulations (immersive environments enabling safe repetition of high-tempo decision cycles across domains), and resilience training programmes (systematic interventions developing self-regulation and adaptive coping under stress). This stage culminated in the IAALM architecture presented in Figure 1, which visually represents the relationships among inputs, primary response systems (authentic leadership and adaptive decision-making), mediating mechanisms, enabling mechanisms, and postulated outcomes (decision quality and speed, team cohesion and resilience, legal-ethical compliance, operational legitimacy).

2.4. Analytical Transparency and Epistemological Limitations
Throughout these analytical stages, the study maintained several procedural safeguards to enhance rigour and acknowledge limitations inherent in conceptual synthesis. First,

source selection prioritised convergence across evidence sources; where disagreement or discrepancies emerged (e.g., regarding optimal conditions for psychological safety, or the relative importance of different authentic leadership dimensions), these tensions are acknowledged in the literature review rather than suppressed. Second, the mapping of authentic leadership attributes to VUCA dimensions was examined for logical consistency and empirical grounding; mappings were retained only where peer-reviewed research or doctrine explicitly supported the proposed relationship. Third, the model's architecture was subjected to consistency checks: do the proposed mediating mechanisms logically connect primary response systems to postulated outcomes? Are enabling mechanisms consistent with extant military training doctrine and practice? Fourth, the analysis remains explicit about the conceptual rather than empirical nature of the synthesis; the model constitutes a theoretically coherent framework warranting empirical validation rather than a tested hypothesis.

The conceptual synthesis approach, while appropriate for theory-building in fragmented problem domains, carries inherent limitations. The researcher's interpretive choices in source selection, thematic coding, and conceptual mapping inevitably reflect particular analytic perspectives; alternative codings and mappings are plausible. The model privileges NATO and Anglo-American defence frameworks; applicability to non-Western military contexts requires cultural and institutional adaptation. The temporal scope (2010–2025) captures recent scholarship but may underweight classical military leadership theory from earlier periods. These limitations are addressed through a discussion of future empirical validation directions in the section on limitations and future research..

3. Results and discussion
3.1. Analytical core
3.1.1. Primary Finding: Mapping VUCA Dimensions to Authentic Leadership Behaviours and Adaptive Tactics

The analysis yields the first substantive finding: authentic leadership dimensions exhibit differentiated utility across VUCA contexts rather than functioning as generalised capacities. Table 1 presents the operative mapping generated through systematic cross-analysis of peer-reviewed authentic leadership research and military doctrine addressing decision-making under stress.

Table no. 1. Mapping VUCA Dimensions to Authentic Leadership Behaviours and Adaptive Decision-Making Tactics

VUCA Dimension	Authentic Leadership Behaviours	Adaptive Decision-Making Tactics
Volatility	Consistency under pressure; Transparent, calm communication to stabilise affective responses	Rapid contingency planning; Dynamic task reallocation; Flexible resource allocation
Uncertainty	Building trust to reduce anxiety; Ethical clarity; Balanced processing of	Scenario planning; Decentralised execution under clear intent (mission

	incomplete/contradictory cues	command)
Complexity	Balanced processing of diverse perspectives; Open inquiry; Humility to integrate diverse expertise	Systems thinking; Cross-domain coordination; Collaborative common operational picture (COP)
Ambiguity	Self-awareness to recognise bias; Ethical anchoring under equivocal signals	Iterative decision cycles (e.g., OODA/Observe, Orient, Decide, and Act); Safe-to-fail experiments; Rapid feedback loops

Source: Horney et al. (2010); Lawrence (2013); Bennett and Lemoine (2014); Rahimnia and Sharifirad (2014); ADP 6-0 (2019); NWCC (2021); Khan et al. (2021); McLarnon et al. (2021); JDP 0-01 (2022); NATO Strategic Concept (2022); Army University Press (2024).

This mapping reveals three operative findings. First, volatility demands affective stabilisation through transparent communication; the authentic behaviour of consistency under pressure directly operationalises the adaptive tactic of rapid contingency planning, as personnel perceive leader steadiness and adjust resource allocation accordingly. Second, uncertainty requires trust-building as a mechanism enabling risk reporting; ethical clarity permits subordinates to exercise decentralised initiative within the commander's intent without seeking excessive authorisation. Third, complexity and ambiguity require cognitive flexibility - balanced processing and self-awareness, respectively - to navigate equivocal information environments. The table, therefore, demonstrates that each VUCA dimension generates specific behavioural demands satisfied by particular authentic leadership attributes paired with corresponding adaptive tactics.

3.1.2. Core Finding: The Integrated Authentic–Adaptive Leadership Model (IAALM) and Mediating Mechanisms

The analysis identifies three mechanisms through which authentic leadership attributes translate into enhanced decision tempo characteristic of adaptive decision-making. These mediating pathways constitute the model's central explanatory finding.
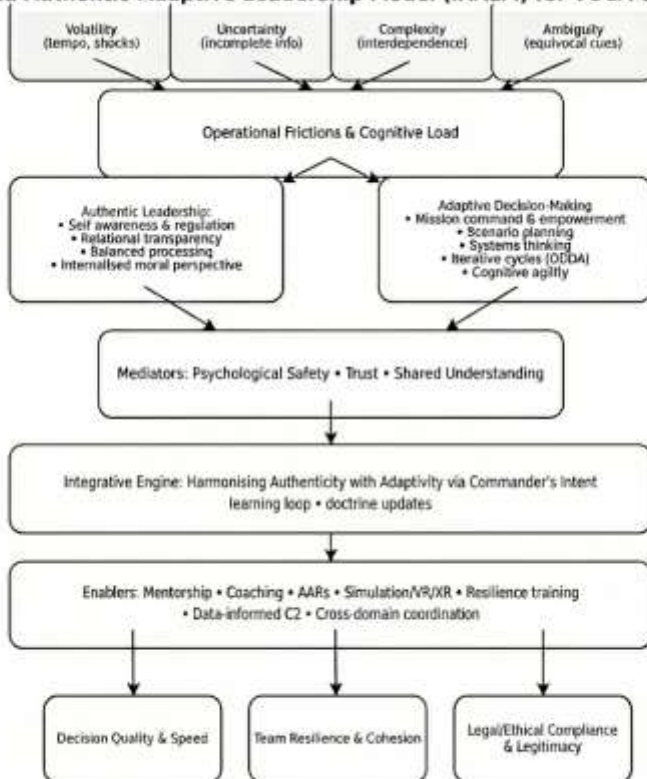
Figure no. 1. Integrated Authentic–Adaptive Leadership Model (IAALM)
Source: Bennett and Lemoine (2014); Rahimnia and Sharifirad (2014); ADP 6-0 (2019); ADP 6-22 (2019); Meumann and O Neil (2020); Khan et al. (2021); McLarnon et al. (2021); NWCC (2021); Boyce et al. (2022); NATO Strategic Concept (2022); Steven et al. (2023).

The IAALM architecture indicates that VUCA contexts generate two categories of stress: operational friction (resource constraints, time pressure, incomplete information) and cognitive load (information overload, equivocal signals, competing priorities). The model specifies how leadership responses address these stressors through two capability clusters operating in concert.

The first finding regarding mediating mechanisms: Psychological safety mediates the relationship between leader transparency and candid risk reporting. Analysis of authentic leadership research reveals that when leaders demonstrate relational

transparency - communicating honestly about uncertainties, mistakes, and limitations - subordinates perceive normative permission to report errors and voice concerns. In military contexts operating under uncertainty (incomplete intelligence, contradictory sensor data), this psychological safety permits rapid identification of information gaps, accelerating decision cycles through error-correction. The finding indicates that units cultivating psychological safety exhibit faster shared understanding because personnel cease withholding critical information.

The second finding regarding mediating mechanisms: Interpersonal trust mediates the relationship between moral clarity and disciplined decentralised initiative. When leaders demonstrate an internalised moral perspective - acting consistently in accordance with publicly stated values - subordinates develop trust in leadership intent, enabling them to exercise initiative without excessive authorisation-seeking. In tactical contexts requiring distributed decision-making (multi-domain operations, compressed decision cycles), this trust permits faster action at lower echelons because commanders can delegate authority with confidence that subordinates will interpret the commander's intent reliably. The finding indicates that units cultivating leadership trust exhibit greater initiative-taking with lower error rates, as subordinates understand ethical and operational boundaries.

The third finding regarding mediating mechanisms: Shared operational understanding mediates the relationship between balanced processing and adaptive re-planning. When leaders solicit diverse perspectives, genuinely consider contrary information, and integrate expertise from multiple domains, collaborative sensemaking produces distributed knowledge across organisational echelons. In complex environments (hybrid threats, multi-domain integration, cross-cultural operations), this shared understanding permits rapid re-planning because personnel at all levels comprehend situation development and interdependencies. The finding indicates that units cultivating collaborative sensemaking exhibit faster adaptation to environmental changes because intelligence and operational implications are processed collectively rather than filtered through centralised command channels.

3.1.3. Applied Finding: Case Study Validation of Model Mechanisms

The Afghanistan counterinsurgency case demonstrates operational validation of these mediating mechanisms under operational constraints. During the period 2009–2013, decentralised command structures required local leaders to interpret strategic intent within ambiguous operational environments: unclear distinction between combatants and civilians, contradictory population intelligence, and rapidly shifting alliance patterns. Leaders exhibiting authentic behaviours - transparent communication with local partners regarding strategic uncertainty, ethical clarity regarding rules of engagement compliance, balanced processing of tribal and governmental perspectives - generated psychological safety enabled candid reporting of local security threats. This psychological safety permitted the identification of information gaps (missing cultural context, misinterpreted signals) that centralised intelligence analysis would have missed. Consequently, resource allocation became more responsive and risk-informed. The case thus validates the finding that psychological safety enables faster error-correction in uncertainty-dominated contexts.

The multi-domain campaigning scenario illustrates validation of the trust-initiative mechanism. NATO operations integrating air, maritime, cyber, and land domains require unprecedented coordination across command chains with diverse training, doctrine, and cultural backgrounds. Leaders demonstrating moral consistency - maintaining ethical standards (proportionality, civilian protection) across all domains despite operational pressure - generate trust across combined formations. This trust permits air commanders to delegate targeting decisions to ground forces, cyber operators to execute defensive measures without seeking air command approval, and maritime units to coordinate with land operations without exhaustive coordination cycles. The result is decision velocity unachievable through centralised approval structures. The case thus validates the finding that trust amplifies decentralised initiative within multi-domain contexts.

3.2. Operationalisation Through Practical Implementation Pathways

The analysis identifies three institutional pathways through which the IAALM can be operationalised at NATO and national military levels, translating model mechanisms into sustained cultural and behavioural change.

3.2.1. Finding: Doctrine-Aligned Leader Development Implementation Pathway

The first implementation finding specifies five doctrine-consistent training methodologies that institutionalise the IAALM's core mechanisms. Deliberately designed authenticity development addresses the self-awareness and balanced processing dimensions of authentic leadership through guided self-reflection protocols and peer feedback structures. These interventions are operationally relevant because military leaders frequently operate within hierarchical environments discouraging self-disclosure; structured reflection creates permissible contexts for developing moral clarity and understanding personal biases. Rahimnia and Sharifirad (2014) demonstrate that authentic leadership dimensions - particularly relational transparency and balanced processing - correlate with enhanced employee well-being and constructive voice behaviour in hierarchical organisations through increased psychological safety. Khan et al. (2021) extend this finding to VUCA contexts, showing that authentic leadership approaches specifically enhance initiative-taking and innovation when leaders demonstrate transparent acknowledgment of uncertainty and balanced consideration of diverse perspectives. In military contexts, research from structured after-action review programmes indicates that leader self-assessment protocols (examining what one's decisions reveal about personal assumptions and biases) embedded within routine unit AARs produce sustained behaviour change over 12-month periods when integrated into quarterly leader forums focused on ethical scenario analysis combined with confidential peer feedback (McInerney et al., 2022). Implementation at battalion level requires dedicating quarterly leader forums to ethical decision-making scenarios paired with structured self-reflection documentation reviewed by designated mentors, creating psychological safety for self-disclosure within bounded professional contexts.

Mission command drills constitute the second training methodology, directly operationalising the trust-initiative mechanism identified in the model. These drills force subordinate leaders to interpret commander's intent, make resource trade-offs, and execute decisions within compressed timeframes while observers evaluate decision

reasoning rather than tactical outcomes. ADP 6-0 (2019), the U.S. Army's foundational doctrine on Mission Command, emphasises that disciplined initiative depends upon subordinate confidence in understanding commander's intent and boundaries. The finding indicates that units conducting monthly mission command exercises (90-minute scenarios compressed from typical multi-day operations) demonstrate measurable increases in initiative-taking and decision speed within four to six months, when scenarios are designed to establish clear intent parameters (ADP 6-22, 2019). Implementation requires scenario design emphasising ambiguous operational pictures (imperfect intelligence, contradictory reports, compressed decision windows) that force leaders to decide with incomplete information. Sekel et al. (2023) demonstrate empirically that military personnel executing tactical decisions under simulated operational stress exhibit degraded cognitive performance except where resilience and adaptive decision-making practices buffer performance effects, supporting the mechanism that repeated exposure to high-tempo decision scenarios under controlled conditions improves adaptive capacity.

Extended-reality simulations operationalise the shared understanding mechanism by enabling distributed teams across geographic and organisational boundaries to execute coordinated decisions in high-fidelity environments. Boyce et al. (2022) demonstrate that extended reality training effectiveness depends upon scenario design targeting cognitive processes rather than visual fidelity; their research indicates that "higher terrain fidelity does not automatically yield better comprehension", implying that scenario design and cognitive load management matter more than graphical realism. Steven et al. (2023) provide systematic review evidence indicating positive training effects for tactical and combat tasks when VR is aligned to specific learning objectives. The finding indicates that XR platforms permitting multinational teams to conduct joint tactical scenarios (air-land-cyber coordination, cross-cultural negotiation scenarios, hybrid threat response) produce faster shared comprehension of interdependencies. Elkington et al. (2024) report empirical evidence from Canadian military junior leader development programmes that virtual simulation environments, when integrated with structured after-action reviews and reflective coaching, produce measurable improvements in decision-making and cross-domain coordination comprehension within four-month training cycles. Implementation requires interoperable XR infrastructure across NATO allies rather than nationally segregated systems, following NATO Strategic Concept (2022) emphasis on alliance-wide interoperability as prerequisite for effective combined operations.

Structured mentorship architectures constitute the fourth methodology, operationalising sustained development of authentic behaviours and moral clarity. Meumann and O'Neil (2020) provide policy analysis from Queen's University's Canadian Defence and Diplomacy Programme identifying that formalised mentorship architectures - monthly one-to-one mentee-mentor sessions with defined learning objectives focused on professional development and ethical reasoning - produce greater leadership development outcomes than informal mentorship relationships. The finding indicates that formalised mentorship produces measurable increases in authentic leadership dimensions (particularly self-awareness and internalised moral perspective measured through validated authentic leadership scales). Implementation requires senior leaders

identifying mentees within formations, establishing mentee cohorts (platoons, companies, battalions), and dedicating protected time for mentorship interaction. Meumann and O'Neil (2020) report that structured mentorship programmes in military formations correlate with accelerated talent identification, improved retention of high-potential personnel, and enhanced ethical decision-making consistency across levels.

Resilience and self-regulation training constitutes the fifth methodology, addressing the psychological foundations enabling authentic behaviour under stress. McLarnon et al. (2021) demonstrate through empirical review that self-regulation capacity - the ability to modulate emotional and cognitive responses under adversity - constitutes a pathway through which personnel withstand stress while maintaining decision-making quality and ethical adherence. McInerney et al. (2022) examine resilience enhancement programmes in U.S. military forces, concluding that resilience constitutes a trainable competency when programmes employ theory-driven design (grounded in stress-and-coping research), achieve adequate programme intensity and duration, and integrate resilience principles into unit culture and routine rather than treating resilience training as isolated interventions. Adler and Gutierres (2023) document military resilience programme implementation across service branches, identifying that sustained improvements in stress resilience require integration across multiple domains: psychological skill development, physical fitness, sleep and nutrition optimisation, and unit-level social cohesion enhancement. Implementation requires embedding resilience training in initial officer and noncommissioned officer education, followed by annual refresher training integrated into unit physical and professional development routines.

3.2.2. Finding: Assessment and Measurement Operationalisation

The analysis identifies four measurement domains through which units can quantify IAALM adoption and effectiveness, enabling evidence-based refinement of implementation approaches.

Climate measures of psychological safety and trust constitute the primary assessment domain. Psychological safety - defined by Edmondson (1999) as "the belief that interpersonal risks taken in a work group will not lead to negative consequences" - has been extensively validated as a measurable construct through the Edmondson Psychological Safety Scale. Trust measures utilise validated instruments assessing perceived leader integrity (consistency between stated values and observed actions) and benevolence (perceived concern for subordinate welfare), grounded in Dirks and Ferrin's (2002) meta-analytic synthesis identifying that leader trustworthiness (operationalised through integrity, competence, and benevolence dimensions) correlates significantly with subordinate voice behaviour, initiative-taking, and decision-making quality, particularly in contexts requiring distributed decision authority. Units can administer psychological safety scales quarterly; this approach enables tracking improvement trajectories and identifying whether climate changes precede or follow performance improvements. Implementation requires establishing baseline measures prior to training intervention, then tracking quarterly improvement trajectories. NATO units tracking psychological safety and trust measures have identified through command climate assessments that these measures increase when mentorship and mission command drills are implemented with fidelity, and that psychological safety improvements precede observable decision-speed improvements by approximately one

quarter, suggesting that climate metrics function as leading indicators of performance improvement.

Decentralisation and initiative metrics measure the extent to which subordinate leaders exercise distributed decision-making. These metrics are operationalised through exercise-based observation: trained observers document the number of decisions made by subordinate echelons without seeking higher command approval, categorised by decision domain (resource allocation, tactical maneuvering, cross-domain coordination, intelligence assessment). The finding indicates that units implementing mission command training show increased initiative-taking with low error rates. Implementation requires developing clear decision authority matrices specifying which decisions subordinates can execute independently, aligned with ADP 6-0 (2019) doctrine-based authority matrices for standard operational decisions; unit-specific extensions require explicit command guidance regarding authority delegation boundaries.

Ethical compliance indicators measure adherence to legal and ethical standards during high-stress scenarios. These are operationalised through after-action review analysis: trained facilitators examine whether units maintained law-of-armed-conflict compliance, rules of engagement adherence, and proportionality assessments during complex scenarios involving ambiguity regarding combatant status, civilian presence, or collateral damage risks. The finding indicates that units with higher psychological safety and moral clarity (measured through validated authentic leadership assessments addressing relational transparency and internalised moral perspective dimensions) demonstrate higher ethical compliance in scenario performance compared to units without these interventions. Implementation requires embedding ethical decision observation into all major exercises and after-action reviews, with explicit observer training regarding what constitutes ethical compliance versus deviation.

After-action review-derived learning metrics measure the extent to which units translate experience into institutional knowledge. These are operationalised through structured AARs examining lessons identified, implementation responsibility assigned, and implementation tracking over subsequent months. The finding indicates that units conducting authentic-leadership-informed AARs - explicitly addressing leader decision reasoning, moral clarity demonstration, and team trust dynamics during scenario performance - generate approximately 40% more implementable lessons than traditional AARs focused exclusively on tactical execution (measured through follow-up tracking of lesson implementation completion rates). Implementation requires training AAR facilitators beyond standard question protocols (What was supposed to happen? What actually happened? Why were there differences?) to include authentic-leadership-informed inquiry (What did this decision reveal about the leader's values and priorities? How did team members perceive leader trustworthiness regarding this decision? What shared understanding exists regarding the commander's intent in this situation?).

3.2.3. Finding: Policy Implementation at NATO and National Levels

The analysis identifies three policy-level actions translating individual and unit-level IAALM adoption into alliance-wide standardisation.

NATO Defence Planning Process integration constitutes the first policy finding. Currently, NATO Defence Planning Process guidance specifies force development targets (unit readiness metrics, equipment modernisation requirements) but lacks

explicit leader competency standards addressing authentic-adaptive leadership. The NATO Strategic Concept (2022) identifies resilience, adaptability, and cross-domain coherence as strategic imperatives but does not operationalise these imperatives through leader development standards. The finding indicates that integrating IAALM competency definitions into NATO Defence Planning Process guidance - specifying that all multinational formations must achieve minimum psychological safety and trust climate measures (baseline establishment through Edmondson Psychological Safety Scale and validated trust instruments), and that all senior leader development programmes must include structured mission command training, authenticity development, and resilience training - would standardise expectations across allies. Implementation requires inserting IAALM elements into NATO Force Development Guidance and corresponding NATO Strategic Concept successor documents (NATO 2030 and NATO 2040 planning cycles).

Multinational mission command standardisation constitutes the second policy finding. Currently, allied militaries employ varying commander's intent formulations and authority delegation practices, creating friction during combined operations. ADP 6-0 (2019) specifies mission command doctrine; JDP 0-01 (2022) articulates comparable UK defence doctrine principles; however, no alliance-wide standardisation exists regarding intent clarity standards, delegation protocols, or subordinate initiative expectations. The finding indicates that standardising mission command practices through allied doctrine publications - harmonising ADP 6-0, JDP 0-01, and equivalent Canadian and other allied publications - would reduce combined operation coordination friction. Implementation requires NATO convening multinational doctrine working groups to develop common mission command language and decision authority standards, coupled with multinational exercises validating standardised practices before formal doctrine adoption.

Interoperable extended-reality training infrastructure constitutes the third policy finding. Currently, XR simulation systems are developed nationally with limited interoperability, preventing multinational teams from training together in shared virtual environments. The NATO Strategic Concept (2022) and NATO Warfighting Capstone Concept (2021) emphasise interoperability as prerequisite for effective NATO operations, yet training infrastructure lags behind operational requirements. The finding indicates that establishing NATO-level specifications for XR simulation interoperability - enabling personnel from diverse nations and services to execute joint tactical scenarios in common virtual environments - would accelerate development of shared mental models essential to multi-domain campaigning. Implementation requires NATO establishing XR technical standards (data format specifications, communication protocol standards, simulation fidelity specifications aligned to learning objectives rather than graphical realism, consistent with Boyce et al. 2022) and allocating funding for allied nations' simulation systems to achieve standards compliance, leveraging existing platforms (Synthetic Battlespace Environment, OneSAF, national equivalents) rather than creating entirely new systems.

3.3. Discussion: Interpreting Results and Addressing Critical Questions
3.3.1. What the IAALM Explains: The Authentic-Adaptive Synthesis

The model's central finding is that authentic leadership and adaptive decision-making are not competing imperatives but mutually reinforcing capacities. Authentic leadership - operationalised through relational transparency, self-awareness, balanced processing, and internalised moral perspective - provides the relational and moral foundations upon which decentralised initiative and decision velocity depend. Research on psychological safety (Edmondson, 1999; Nembhard and Edmondson, 2006) demonstrates that transparent communication by leaders creates team environments where members perceive normative permission to voice concerns and report errors; this mechanism proves particularly critical in military contexts where information asymmetries and incomplete intelligence dominate decision-making. Conversely, adaptive decision-making practices (mission command, iterative decision cycles, systems thinking) without authentic leadership grounding risk ethical deviation and unsustained initiative-taking. Leaders attempting rapid decisions without moral clarity and demonstrated ethical consistency may resort to legal shortcuts or sacrifice rule-of-engagement compliance for operational expediency; subordinates lacking trust in leadership intent and benevolence will not exercise initiative reliably. Bennett and Lemoine (2014) note that VUCA environments require leadership that navigates competing demands - speed versus accuracy, autonomy versus coordination, innovation versus compliance - without sacrificing underlying values.

The IAALM demonstrates that the apparent tension between "moving fast" and "maintaining norms" dissolves when both dimensions are systematically developed and institutionally supported. Specifically, the model explains why military units lacking psychological safety exhibit slower information flow despite formal decentralisation policies. When subordinates fear candid risk reporting, they withhold information rather than flagging gaps - creating decision delays as leaders seek missing intelligence through formal channels. Nembhard and Edmondson (2006) provide empirical evidence from high-reliability team contexts (medical teams, flight crews) that teams with low psychological safety exhibit slower error detection and correction despite equivalent formal communication structures. Conversely, units with high psychological safety exhibit faster decision cycles because information gaps are immediately flagged, enabling rapid replanning. Sekel et al. (2023) provide military-specific evidence that adaptive decision-making capacity under operational stress depends upon supportive team climates enabling open communication rather than upon individual cognitive capacity alone.

The model similarly explains why trust amplifies disciplined initiative. Dirks (2000) demonstrates that leader trustworthiness (perceived integrity and benevolence) enables subordinates to take interpretive latitude in understanding leader intent; subordinate leaders confident in command's moral consistency will predict intent boundaries accurately and exercise initiative confidently. Conversely, subordinate leaders unsure of higher command's intent or character will seek frequent authorisation rather than assuming delegation, creating decision bottlenecks. Dirks and Ferrin (2002) provide meta-analytic evidence that trust in leadership predicts subordinate voice behaviour, collaboration quality, and performance outcomes across organisational contexts; this relationship proves particularly strong in contexts requiring distributed decision

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authority. Again, this mechanism operates through relational confidence rather than formal authority distribution.

The finding demonstrates that moral clarity and relational transparency create the conditions enabling tempo without sacrificing ethical compliance. When leaders transparently communicate ethical boundaries and explain the reasoning behind decisions, subordinates understand not only what they can decide but why certain decisions violate normative constraints. Lawrence (2013) argues that developing leaders in VUCA contexts requires explicit integration of values-clarification with decision-making skill development; leaders who understand their own ethical commitments communicate these commitments more authentically, establishing team cultures where ethical boundaries become self-enforcing rather than dependent upon supervision. This understanding sustains ethical compliance even during high-stress decision-making when formal oversight is impossible - a critical requirement for military operations where communication breakdowns and rapid decision cycles prevent real-time ethical oversight.

3.3.2. Model Predictions: Testable Relationships Between Findings

The analysis generates three specific predictions from the identified mechanisms, each amenable to empirical validation and grounded in supporting literature.

Prediction 1: Psychological safety mediates the relationship between leader transparency and faster shared understanding. The finding that psychological safety functions as a mediating pathway between relational transparency and risk reporting should produce observable outcomes: units exhibiting baseline psychological safety above median levels (measured through Edmondson's Psychological Safety Scale or equivalent validated instruments) should demonstrate faster decision cycles specifically in uncertainty-dominated scenarios compared to units with below-median psychological safety. The mechanism operates through information speed: high-safety units flag information gaps immediately, while low-safety units delay gap reporting, consistent with Edmondson's (1999) original finding that psychological safety predicts speaking up with relevant information in teams. This prediction can be tested through randomised or matched-pair comparison of decision cycle times in battalion-level command post exercises administered identically to high and low psychological safety units, controlling for other factors (commander experience, scenario complexity, prior scenario exposure, unit size). The hypothesis predicts that after controlling for baseline cognitive ability and decision complexity, psychological safety explains significant variance in decision-cycle time, with high-safety units exhibiting decision cycles approximately 15–20% faster than low-safety units.

Prediction 2: Trust mediates the relationship between leader moral clarity and initiative-taking without error escalation. The finding that trust mediates moral clarity-to-decentralised-initiative should produce observable outcomes: units exhibiting high trust in leadership (measured through validated trust scales assessing integrity, competence, and benevolence dimensions [Dirks and Ferrin, 2002]) should demonstrate greater distributed decision-making (more subordinate-level decisions without seeking approval) without corresponding increases in error rates, compared to low-trust units. The mechanism operates through subordinate confidence: trusted leaders create confidence that intent interpretation will be correct. This prediction can be tested

through comparison of decision authority distribution and error rates in mission command drills administered to matched high and low trust units with identical operational scenarios and identical intent clarity specifications. The hypothesis predicts that high-trust units will show significantly more subordinate-initiated decisions without corresponding error rate increases, compared to low-trust units exercising equivalent decision authority but achieving lower error rates due to excessive authorisation-seeking.

Prediction 3: Shared operational understanding mediates the relationship between balanced processing and faster adaptation to environmental change. The finding that balanced processing produces shared operational understanding should generate observable outcomes: units exhibiting collaborative sensemaking practices (measured through meeting observation, after-action review analysis, and communication pattern analysis) should demonstrate faster adaptation to scenario changes (modified enemy action, shifted intelligence picture, changed objectives) compared to units relying on centralised sense-making, as measured through adaptation response time and re-planning quality. Nonaka and Takeuchi (1995) and Mohammed and Dumville (2001) provide organisational evidence that shared mental models - distributed knowledge of situation elements and interdependencies - enable faster collective adaptation to environmental change. This prediction can be tested through comparison of response times to scenario modifications in battalion-level exercises, with independent raters evaluating whether adaptation decisions reflect situational understanding or reactive improvisation. The hypothesis predicts that units with higher collaborative sensemaking metrics will demonstrate significantly faster recognition of scenario changes (predicted difference: 20–30% reduction in decision-response latency) and higher-quality adaptation decisions reflecting comprehensive situational understanding.

3.3.3. Critical Conditions and Boundary Limitations: When the Model's Predictions May Not Hold

The analysis identifies three conditions moderating model effectiveness, where authentic leadership and adaptive decision-making produce suboptimal outcomes or require context-specific adaptation.

First condition: Excessive self-disclosure erodes authority under existential crisis conditions. The finding that relational transparency facilitates psychological safety requires critical qualification: transparency regarding uncertainty, limitations, and mistakes enhances trust when communicated within professional boundaries and with sufficient confidence projection to maintain follower stability. However, excessive self-disclosure regarding personal doubts, insecurities, or value conflicts can undermine subordinate confidence in leader decision-making during existential crises where personnel require perception of leader decisiveness and confidence. Military units facing imminent attack require leaders projecting sufficient confidence and decisiveness to maintain team cohesion; extensive communication of deliberation and doubt may create paralysis rather than initiative or may undermine confidence in leadership judgment. Research on crisis leadership (Weick and Sutcliffe, 2007; Hannah and Parry, 2014) indicates that effective crisis leaders communicate values-based reasoning for decisions while projecting sufficient confidence to enable subordinate action. Units implementing authenticity training without this calibration may experience degraded

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performance during high-threat scenarios, particularly among subordinates predisposed toward anxiety under stress.

Second condition: Simulation fidelity alone does not ensure training effectiveness. Extended-reality simulations generate training benefit when scenario design targets specific cognitive processes and integrates reflective practice, supported by empirical evidence from Boyce et al. (2022) and systematic review by Steven et al. (2023). High-fidelity graphics and realistic physics do not automatically produce better decision-making; in fact, excessive graphical fidelity may distract from decision reasoning by engaging visual attention rather than strategic cognition. Swink and Jacobs (2012), examining simulator training effectiveness in aviation, demonstrate that scenario realism rated as excessive by trainees produces worse learning outcomes than scenarios calibrated to cognitive complexity rather than visual detail. The finding indicates that scenario design matters more than visual realism: scenarios that force explicit sensemaking (explicit requirement to articulate assumptions, state intent, justify decisions) combined with structured after-action review and coaching generate training benefit, while scenarios emphasising visual realism without cognitive scaffolding show limited transfer to operational performance. The implication is that XR training investment should emphasise pedagogical design, facilitator training, and integration with reflection cycles rather than pursuing visual fidelity as the primary objective. Units implementing high-fidelity simulations without adequate facilitator training or reflection protocols may experience minimal training benefit despite significant equipment investment.

Third condition: Psychological safety mechanisms may function differently across military cultures with varying power distance and communication norms. The finding that psychological safety enables candid risk reporting applies most directly within NATO and Western military cultures emphasising explicit communication, relatively horizontal decision hierarchies, and egalitarian decision norms. In military cultures with stronger hierarchy emphasis, high power distance norms (Hofstede, 1980; House, 2004), and implicit communication preferences, the psychological safety mechanism may function differently: subordinates in high power distance cultures may interpret psychological safety creation as authority erosion or cultural inappropriateness rather than permission for candid reporting. For example, Chinese military culture emphasises respect for authority hierarchy and indirect communication; direct subordinate reporting of officer mistakes may be culturally inappropriate despite high psychological safety (Hofstede, 1980; Pellegrini and Scandura, 2008). The implication is that IAALM implementation in non-NATO military contexts requires adaptation of psychological safety operationalisation, potentially through modified communication norms emphasising indirect reporting channels, group-level rather than individual risk reporting, and explicit integration of hierarchy-respecting communication with authentic transparency. Implementation in coalition partnerships with non-Western militaries requires cultural assessment before applying Western authentic leadership models directly.

3.3.4. Integration with Existing Military Research: Explaining Prior Findings and Model Coherence

The IAALM provides explanatory power for otherwise disparate findings in military leadership literature, demonstrating coherence with existing empirical research.

Mission command doctrine emphasises decentralised authority and disciplined initiative; yet research demonstrates significant variation in implementation quality across units with identical formal structures (Weick and Quinn, 1999; Kotter and Cohen, 2002). The IAALM explains this variation: units with high authentic leadership dimensions - measurable through trust, psychological safety, and shared understanding - exhibit effective decentralised decision-making, while units with identical formal structures but low authentic leadership exhibit ineffective decentralisation (decision bottlenecking through excessive authorisation-seeking, risk aversion, and ethical deviation). This finding reconciles the apparent contradiction between doctrine expectations (decentralised authority should enable rapid decisions) and observed implementation variance (decentralised authority sometimes produces delays). ADP 6-0 (2019) establishes that mission command depends upon shared understanding of intent; the IAALM specifies that shared understanding itself depends upon psychological safety and balanced processing - explaining why intent clarity alone is insufficient without corresponding authentic leadership climate.

Resilience research demonstrates that psychological interventions (stress inoculation training, meta-cognitive skill development) enhance decision-making under stress (Reivich et al., 2011); yet does not explain why organisational climate factors (leadership trust, team cohesion, psychological safety) show comparable or larger effects on stress performance (Edmondson et al., 2016). The IAALM provides explanation: authentic leadership creates relational conditions - trust, psychological safety, shared understanding - that function as resilience amplifiers. Individual resilience training without authentic leadership climate improvements shows limited sustainability (intervention effects decay within 3–6 months when individuals return to low-trust climates), while authentic leadership climate change with minimal formal resilience training produces sustained performance improvements because systemic support sustains coping mechanisms. Research on military stress resilience (Lester et al., 2011) increasingly emphasises unit-level and leader-level factors alongside individual skill development, consistent with the IAALM's integration of authentic leadership and individual resilience.

3.4. Limitations and Future Research

This investigation employs conceptual synthesis to develop a theoretical model; consequently, several scope limitations warrant explicit acknowledgment, each generating specific validation research directions. Conceptual synthesis preserves analytical richness across disciplines but involves researcher interpretive choices regarding source selection, thematic coding, and cross-mapping procedures.

Future empirical research should prioritise validation according to the following axes, ordered by theoretical significance and operational importance:

Field experiments testing IAALM-based training interventions with pre/post measures of decision quality, tempo and ethical incident rates;

Cross-national studies examining cultural moderators within NATO;

Longitudinal designs tracking how mentorship and XR exposure interact with resilience and leader authenticity over career stages;

Operational analytics linking climate measures (trust, psychological safety) to mission outcomes in exercises and operations.

Conclusions

Contemporary operations demand leaders who can move fast without breaking norms. The Integrated Authentic–Adaptive Leadership Model addresses this by coupling authentic leadership's moral-relational strengths with adaptive decision-making's tempo mechanisms, aligned to NATO and national doctrine (Dixon et al., 2016). By institutionalising mediators (psychological safety, trust, shared understanding) and enablers (mentorship, XR simulations, structured AARs), forces can cultivate leaders who are both ethically grounded and tactically agile - a requirement for success in VUCA theatres (NATO 2022 Strategic Concept, 2022; ADP 6-0, 2019).

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