ABSTRACT:
This thesis contributes to our understanding of cognitive interoperability by exploring barriers, facilitators, and contextual factors to create a framework. With the advent of the cognitive domain in warfighting, the adversary pursuit of strategic advantage through cognitive science demands that we seize the initiative and seek cognitive superiority with allies and partners. Prior research acknowledges the importance of human interoperability but is limited to singular studies at the operational and national level. This thesis shifts focus to the military strategic and multinational level to uncover cognitive and cultural inhibitors and enablers of cognitive interoperability. The empirical data is drawn from a distinct case study that examines senior military officers during a combined exercise. The analysis explores competencies that foster strategic empathy and collective intentionality with identity and human connectivity as major catalysts. Individuals are agents who collectively construct cognitive interoperability, setting conditions for cognitive dominance in future military competition.

Keywords:
Cognitive interoperability, cognitive superiority, cooperation theory, collective intentionality, cultural dimension theory, cross-cultural competence, perspective taking, alliance theory, professional military education
Table of Contents

LIST OF ABBREVIATIONS ................................................................. IV

LIST OF FIGURES ........................................................................ V

LIST OF TABLES ........................................................................ VI

1. INTRODUCTION ......................................................................... 1
   1.1 PROBLEM STATEMENT .......................................................... 2
   1.2 RESEARCH PURPOSE ............................................................. 3
   1.3 RESEARCH QUESTIONS .......................................................... 3
   1.4 SOURCES ............................................................................. 4
   1.5 DISPOSITION ....................................................................... 4

2. LITERATURE REVIEW ............................................................... 5
   2.1 DOCTRINAL DEFINITION ....................................................... 5
   2.2 SCIENTIFIC DISCUSSION ..................................................... 5
   2.3 SUMMARY OF PREVIOUS RESEARCH .................................. 10
   2.4 RESEARCH GAPS AND CONTRIBUTION ................................. 10

3. THEORY ..................................................................................... 11
   3.1 INTERCULTURAL THEORY .................................................... 12
   3.2 COOPERATION THEORY ....................................................... 14
   3.3 ALLIANCE THEORY ............................................................... 16
   3.4 RELEVANCE ....................................................................... 16

4. METHOD .................................................................................... 17
   4.1 RESEARCH DESIGN .............................................................. 17
   4.2 EMPIRICS ............................................................................ 18
   4.3 ETHICAL CONSIDERATIONS ............................................... 22
   4.4 TRUSTWORTHINESS ............................................................. 22
   4.5 OPERATIONALIZATION OF THEORIES ................................... 23

5. RESULTS AND ANALYSIS ......................................................... 24
   5.1 PARTICIPANTS ..................................................................... 24
   5.2 RESULTS .............................................................................. 25
   5.3 RESEARCH QUESTION RESPONSES ................................... 39

6. DISCUSSION .............................................................................. 43
   6.1 INTERPRETATION ................................................................. 43
   6.2 IMPLICATIONS FOR THEORY AND PRACTICE ...................... 44
6.3 METHODOLOGICAL AND EMPIRICAL IMPLICATIONS .................................................. 48
6.4 RECOMMENDATION FOR FURTHER RESEARCH .............................................. 49
6.5 CONCLUSIONS .................................................................................................. 50

REFERENCES ........................................................................................................ 51

APPENDICES ........................................................................................................ 54

APPENDIX A: INTERVIEW CONSENT FORM ............................................................ 54
APPENDIX B: RESEARCH TOPIC INFO SHEET ....................................................... 55
APPENDIX C: SEMI-STRUCTURED INTERVIEW QUESTIONS .................................... 56
APPENDIX D: ARTIFICIAL INTELLIGENCE CODING WORKSHEET ....................... 58
List of Abbreviations

After Action Review (AAR)
Computer Assisted Qualitative Data Analysis Software (CAQDAS)
Cross-Cultural Competence (3C)
Department of Defense (DoD)
Diplomatic, Information, Military, Economic (DIME)
Joint Advanced Command and Staff Program (JACSP)
Joint Advanced Warfighting School (JAWS)
Knowledge, Skills, Attitudes (KSA)
National Defense Strategy (NDS)
National Defense University (NDU)
National Military Strategy (NMS)
National Security Strategy (NSS)
North Atlantic Treaty Organization (NATO)
Political, Military, Economic, Social, Information, Infrastructure (PMESII)
Professional Military Education (PME)
Supreme Allied Commander Europe (SACEUR)
Swedish Defense University (SDU)
United States Marine Corps (USMC)
List of Figures

FIGURE 1: COGNITIVE DOMAIN IN DIME .................................................................................. 1
FIGURE 2: Coder’s Dimensions of Multinational Interoperability ........................................... 6
FIGURE 3: Crowson’s Cultural Interoperability Framework (Author’s Design) ......................... 7
FIGURE 4: Oliver’s Cognitive Continuum to Human Interoperability ........................................ 9
FIGURE 5: Multi-paradigmatic Human Domain (Author’s Adaptation) .................................. 11
FIGURE 6: Hofstede’s 6-D Model .......................................................................................... 12
FIGURE 7: Rosenthal’s et al. Composite Perspective Taking Model (Author’s Adaptation) ....... 14
FIGURE 8: Research Design .................................................................................................. 17
FIGURE 9: JAWS Mission & FIGURE 10: JAWS Student Population .......................................... 18
FIGURE 11: JACSP Mission .................................................................................................. 18
FIGURE 12: Interviewee Gender ............................................................................................ 19
FIGURE 13: Branch of Service (JACSP) & FIGURE 14: Branch of Service (JAWS) ..................... 20
FIGURE 15: Nationality (JACSP) & FIGURE 16: Nationality (JAWS) .......................................... 20
FIGURE 17: Codes to Theory Model ....................................................................................... 26
FIGURE 18: Coded Themes and Main Categories ..................................................................... 26
FIGURE 19: Cognitive Interoperability Framework .................................................................... 42
List of Tables

TABLE 1: OPERATIONALIZATION ........................................................................................................ 23
TABLE 2: SEMI-STRUCTURED INTERVIEW JAWS DEMOGRAPHICS ...................................................... 24
TABLE 3: SEMI-STRUCTURED INTERVIEW JACSP DEMOGRAPHICS ..................................................... 25
1. INTRODUCTION

“With the right people, the right skill set, preparation [...] agility and day zero integration / interoperability, NATO ACT is driving cognitive superiority [...] to “out-think”, [...] “out-fight”, [...] and “out-partner” [...] NATO’s adversaries.”¹

NATO Warfighting Capstone Concept 2021

‘Cognitive superiority’ is based on the premise that warfare increasingly takes place in the emergent cognitive, or human domain, which is characterized by new forms of knowledge and cognition, the advent of artificial intelligence, machine learning, augmented reality, and human-machine integration. The cognitive domain is becoming a ‘bloodless battlefield’² where opposing world views, grand strategies and narratives of power and science are weaponized to target the human mind.³ Cognitive superiority is conceptualized in relation to the adversary, and expresses a relative attribute of thinking better, learning faster, and acting smarter.⁴

Figure 1: Cognitive domain in DIME ⁵

Another perspective on cognitive superiority is in relation to oneself and one’s allies and partners. NATO’s stated goal of “out-thinking” and “out-partnering” the adversary requires ‘cognitive interoperability’ and ‘collective intentionality’. This idea also meshes with the 2022 National Defense Strategy (NDS) which describes how the U.S. Department of Defense (DoD) safeguards U.S. national interests, defends democratic values, and deters strategic attacks against the homeland, and its allies and partners through ‘integrated deterrence’. It leverages all instruments of national power (DIME) throughout the competition continuum and across warfighting domains together with the interagency and a network of alliances and partnerships.⁶ Allies and partners increasingly take the lead in their own self-defense and

¹ NATO Allied Command Transformation, NATO Warfighting Capstone Concept (Norfolk, VA, 2021), Link
³ Hartley III & Jobson, 2020, p. 15
⁴ Ibid, p. 22
⁵ Ibid, p. 17
regional security such as in the Indo-Pacific theater, where the U.S. is becoming an enabler for South Korean, Japanese, and Taiwanese self-defense capabilities. The rationale for delegating responsibility and relinquishing control is grounded in the common view that these practices lead to a more balanced security environment.

Sweden's security policy is focused on Swedish sovereignty, the pursuit of Sweden's national security interests, and the safeguarding of Swedish freedom of action. The 2020 Swedish Defense Proposition recognizes challenges to the current security architecture, the rule-based world order, and the rule of law. Despite Sweden’s regional focus on the Baltic Sea region and Russia as the primary security concern, the ‘transatlantic link’ to the U.S. is considered vital for Swedish and European security. To strengthen the link, Sweden prioritizes collaborative skills, exercises and training, research and development, and international missions. Acting together during crisis presupposes interoperability which develops through political dialogue, military relationships, and exercises. These activities necessitate secure communication systems, frameworks, logistics solutions, and infrastructure adaptation.

Setting conditions for mutually desired bilateral cooperation, interoperability is the measure to determine how well military organizations and individuals work together to achieve a common goal. Given the unlikelihood of success by unilateral response in the changed security environment, interoperability becomes a decisive condition for collective action. Interoperability is much discussed at the operational or tactical level; broken down into functional areas such as technical, or logistical; or viewed through the lens of doctrine, or tactics, techniques, and procedures. Often, the focus is on technical compatibility, such as how to connect data links, share intelligence, or standardize ammunitions and fuel blends. However, cognitive, and cultural differences can impact interoperability more than technological systems compatibility which places cognitive interoperability in the center of this study.

1.1 Problem statement

Motivated by participation in the ‘Joint Advanced Command and Staff Program’ (JACSP) at Swedish Defense University (SDU), this paper problematizes the development of cognitive interoperability

---

8 Försvarsdepartementet, 2020, p. 32
9 Försvarsdepartementet, “Avsiktsförklaring/Statement of Intent between the U.S. and Sweden” (Stockholm, 8 June 2016), [Link](Försvarsdepartementet, “Avsiktsförklaring/Statement of Intent between the U.S. and Sweden” (Stockholm, 8 June 2016))
10 Försvarsdepartementet, 2020, p. 76
amongst multinational senior military officers during a combined exercise. Scenario-based cooperation with allies and partners warrants more than a ‘check in the box’ as it fosters genuine perspective taking and common views. There seems to be a lack of awareness of the criticality of cognitive interoperability in achieving cognitive superiority. Its role in offsetting cognitive limitations such as blind spots, gaps in awareness, and other inhibitors to successful partnering is underappreciated. As a cross-cultural awareness continuum of collective intentions, cognitive interoperability warrants a more thorough study. In observing roadblocks and gateways for cognitive interoperability that inform the development of a framework, the author hopes to remedy this disconnect and showcase that commonality of thought in the cognitive domain leads to unity of purpose and synergistic effects across all warfighting domains.

1.2 Research purpose

The purpose of this inquiry is to determine whether and how a combined strategic planning exercise during multinational senior professional military education (PME) can foster cognitive interoperability amongst its participants. The study aims to conceptualize cognitive interoperability from a military strategic vantage point; discover which factors inhibit or promote the development of cognitive interoperability; and understand how the experiences during the combined strategic appraisal exercise inform the development of a framework for cognitive interoperability that recognizes human beings as agents and organizational ‘boundary spanners’ and the role of adaptive and cross-cultural competencies in creating human networks of trust.13

1.3 Research questions

Question 1: What are the major roadblocks for cognitive interoperability during a combined strategic appraisal exercise for officers from the U.S., Sweden, the UK, South Korea, and Taiwan?

Question 2: What are the main facilitators for cognitive interoperability during a combined strategic appraisal exercise for officers from the U.S., Sweden, the UK, South Korea, and Taiwan?

Question 3: How do the experiences of officers from the U.S., Sweden, the UK, South Korea, and Taiwan during a strategic appraisal exercise inform a cognitive interoperability framework?

1.4 Sources

The author conducted research on the internet using Google Scholar, and the web-based databases of SDU’s Anna-Lindh Library in English and Swedish, the U.S. Marine Corps University Research Library, the U.S. Marine Corps Center for Lessons Learnt (MCCLL) and the Joint Lessons Learnt Info System (JLLIS). The empirical data consists of semi-structured interviews, and observational notes. The secondary material consists of NATO, U.S., and Swedish doctrine, scientific theories and books, journal articles, technical reports, and dissertations.

1.5 Disposition

This introduction is followed by the literature review in chapter 2 to evaluate relevant literature and identify the research gap. Chapter 3 introduces intercultural and cooperation theory with a focus on ‘collective intentionality’ and the ‘multi-cultural perspective taking framework’. Chapter 4 describes the methodology, and the operationalization of the theories. Chapter 5 contains the data analysis and interpretation of results. Chapter 6 interprets the results and relates them to theory and method, presents practical implications, evaluates generalizability, and suggests areas for future research.
2. LITERATURE REVIEW

This chapter evaluates relevant literature including NATO doctrine, and existing models, considerations for a strategic framework, PME, and joint cognitive interoperability considerations.

2.1 Doctrinal definition

NATO acknowledges that the inherent multinational nature of its forces requires interoperability and common ground despite different national doctrine, agendas, readiness, and fighting power. Moreover, different perspectives must be reconciled into NATO’s common vision.\textsuperscript{14} Interoperability hinges on effective communication, rapport, respect and trust, knowledge of partners, and patience.\textsuperscript{15} Interoperability is defined as “the ability to act together coherently, effectively, and efficiently to achieve Allied tactical, operational and strategic objectives.”\textsuperscript{16} NATO discerns three interoperability dimensions - technical, procedural, and human, the latter encompassing language, terminology, and training. These concepts are captured in standardization agreements (STANAGs) to integrate national capabilities and achieve synergy.\textsuperscript{17} NATO doctrine itself is considered the ‘common language for operations’ allowing for a shared mindset and common approach at the intellectual level.\textsuperscript{18} Of note, English is not the native language for most NATO members. This complicates clear and concise information exchange due to the meaning of words being constructed based on the environmental or national context. Cognitive interoperability is not expressly articulated in current NATO doctrine.

2.2 Scientific discussion

**Models**: Anchored in NATO’s definition, Codner describes interoperability (IO) as a multidimensional concept.\textsuperscript{19} Behavioral interoperability, which is governed by human responses to perceptions in the security environment, is considered to be high when two units or groups respond to a military situation in similar ways.\textsuperscript{20} In terms of doctrinal aspects of behavioral interoperability, he highlights military strategic congruence, which suggests a similar view on how to achieve military objectives. Training and education exchanges can achieve mutual understanding and resolve different doctrinal perspectives.

\textsuperscript{14} North Atlantic Treaty Organization, ‘Allied Joint Publication-01 (2017), 1-13 \textbf{Link}
\textsuperscript{15} NATO AJP 1-0, 2017, 4-3
\textsuperscript{16} Ibid, LEX-5
\textsuperscript{17} Ibid, 1-2
\textsuperscript{18} Ibid
\textsuperscript{19} Codner, 2003, p. 30
\textsuperscript{20} Ibid, p. 51
Political will that emphasizes the importance of allies and partners in national security policies is a pre-requisite for such shared views.\textsuperscript{21}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure2.png}
\caption{Coder’s Dimensions of Multinational Interoperability.\textsuperscript{22}}
\end{figure}

Moon et al review four interoperability models that focus on the exchange of services between systems, units, and forces to cooperate effectively, and enable command and control.\textsuperscript{23} The types of interoperability are grouped into technical and ‘transactional interoperability’ between organizations, which includes doctrinal, behavioral, and cultural aspects. The so called ‘human-activity’ aspects are concerned with culture, ethics, trust, and shared understanding.\textsuperscript{24} However, operational flexibility largely remains in the realm of technical interoperability and information exchange; ‘human will’ is mainly leveraged to develop and integrate new technologies.

**Operational:** Cognition and culture are inextricably linked; culture influences all levels of war; and cultural differences shape behavioral interoperability. Cultural interoperability depends on language, which in turn impacts technical interoperability such as information exchange. Cultural interoperability is difficult to model, yet critical to cultural awareness.\textsuperscript{25} Crowson recognizes that trust-based partnerships are built on appreciating partner culture and accepting cultural differences, but that studying ‘friends’ is usually a mere afterthought in operational planning.\textsuperscript{26} Crowson selects four indicators that determine military cultural compatibility, ‘societal narrative’, ‘inclusion’, ‘power and authority’ and ‘catalysts’. This type of friendly force analysis creates common knowledge, saves time, prevents

\textsuperscript{21} Ibid, p. 65
\textsuperscript{22} Codner, 2003, p. 31
\textsuperscript{24} Moon et al, 2003, p. 5
\textsuperscript{25} Ibid, p. 66-67
\textsuperscript{26} Crowson, 2016, p. 109
redundancies, and cultural frustration. Crowson considers “seeing your friends” central to all operational planning, and to joint and allied doctrine.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Indicator Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Societal narrative</td>
<td>History Connections Support Enmity</td>
</tr>
<tr>
<td>Inclusion</td>
<td>Prejudice Diversity</td>
</tr>
<tr>
<td>Power &amp; authority</td>
<td>Allegiance Accession Command</td>
</tr>
<tr>
<td>Catalysts</td>
<td>Technology Education Interaction Jointness</td>
</tr>
</tbody>
</table>

*Figure 3: Crowson’s Cultural Interoperability Framework (Author’s design)*

**Strategic:** While not expressly related to interoperability, Kim’s ‘Analytical Cultural Framework for Strategy and Policy’ provides cultural considerations for cultural proficiency at the strategy and policy level, and their role in determining strategic action and behavior, and thereby strategy formulation and outcomes. The three dimensions of ‘identity’, ‘political culture’, and ‘resilience’ represent cultural lenses that allows strategists to view the world from a multi-dimensional and multi-perspective point of view, providing an avenue to conceptualize cognitive interoperability at the strategic level. Likewise, Yarger proposes key strategic factors or ‘natural and social determinants’ that affect power relationships and balance between various actors. He uses Gray’s 17 strategic dimensions as lenses to discern what is important, however, he acknowledges that different constructs exist and may be warranted to structure the vast amount of information at hand. Lastly, Edström, Gyllensporre, and Westberg offer three unit level characteristics as intervening variables in their analytical framework for military strategic adjustments of small states – ‘geographical characteristics’, ‘historical experiences’, and ‘alliance membership’. Originally designed in relation to the dependent variable ‘defense strategies’, these characteristics encompass formative experiences and ‘axiomatic beliefs’ about national identity, collective conscious, and behaviors and thereby inform the military-strategic cognitive interoperability discussion.

**PME:** Paget discusses the development of ‘interoperability of the mind’ in PME and its potential to remedy stereotypes and prejudice. Cultural interoperability grounded in a common language, similar ethos, and comparable principles can be developed through the exchange of ideas, cultural

---

27 Crosson, 2003, p. 119
28 Ibid
29 Kim, Jiyul, Cultural Dimensions of Strategy and Policy, Strategic Studies Institute (May 2009), pp. 9, Link
31 Yarger, 2008, p. 61
33 Edström et al., 2019, p. 28
acclimatization, and cross-cultural interaction during PME in a way that is often not possible during operations.\textsuperscript{35} Given the many examples in which cultural factors have turned out to be the main source of friction in multinational operations, to include among close allies, the human element in interoperability, or the ability ‘to transcend cultural differences and bring people from different cultures together’ plays a central role; transcending differences is complicated due to the co-existence of a diverse set of constructed national military and doctrinal cultures and identities.\textsuperscript{36} Creativity and flexibility of thought can be developed through a four-step progression from single-service to joint to whole-of-government, to interagency to multinational / internationalized PME. Cultivating working relations in an academic environment can also help overcome or reverse negative attitudes and resentment.\textsuperscript{37} For more divergent cultures, PME may be the most uncontentious setting for engagement and exchange.\textsuperscript{38} Paget concludes that the benefits of the inclusive “epistemic communities”\textsuperscript{39} of international PME graduates are diplomatic, political, and operational, and that “human interoperability is the lynchpin of cohesion within a coalition”.\textsuperscript{40}

Rosson examines the role of PME in developing perceived cognitive interoperability in a staff exercise between U.S. and UK students with the goal of determining the effectiveness of officer PME. Rosson emphasizes the importance of military culture, which in some countries is only “loosely affiliated or almost wholly separated from national culture”.\textsuperscript{41} ‘Cognitive mastery’ is not confined to understanding military culture but encompasses social and national cultural knowledge and cultural sensitivity.\textsuperscript{42} Rosson’s operationalizes Hofstede’s cultural dimensions theory and Thibaut’s and Kelley’s interdependence theory, to examine cross-cultural communication, interpersonal interactions and group dynamics.\textsuperscript{43} Rosson acknowledges that the cultural similarities in U.S. and UK students impact learning outcomes and cognitive interoperability development.\textsuperscript{44} Rosson’s empirical data offers insights in best instructional methods; provides a predictive assessment of potential challenges in developing cognitive interoperability; and illuminates how the composite skills of critical and creative thinking skills develop through cooperative learning.\textsuperscript{45}

\footnotesize
\begin{itemize}
  \item \textsuperscript{35} Paget, 2016, p. 42
  \item \textsuperscript{36} Ibid, p. 44
  \item \textsuperscript{37} Moskos, Charles, ‘International Military Education and Multinational Military Cooperation’ \textit{U.S. Army Research Institute for the Behavioral and Social Sciences}, (2004), p. 2
  \item \textsuperscript{38} Ibid, p. 47
  \item \textsuperscript{39} Atkinson, Carol, ‘Military Soft Power: Public Diplomacy through Military Educational Exchanges’ (Lanham, MD, 2014), p. 103
  \item \textsuperscript{40} Paget, 2016, p. 48
  \item \textsuperscript{41} Rosson, Steven, ‘Using Elements of Professional Military Education to Develop Cognitive Interoperability Among Multinational Military Officers: A Case Study’, Scholars Crossing (2022), p.5 \textcolor{blue}{Link}
  \item \textsuperscript{42} Rosson, 2022, p. 5
  \item \textsuperscript{43} Ibid, p. 6
  \item \textsuperscript{44} Ibid, p. 7
  \item \textsuperscript{45} Ibid, p. 12
\end{itemize}
**Joint:** Oliver discusses the creation of a ‘joint state of mind’ from discrete service-specific mindsets and contends that this kind of coherent mindset is still an ‘elusive aspiration’.\(^{46}\) He discusses false expectations of same-mindedness which are rooted in the assumption that for one, cooperation and understanding are a given, and for two, that political or strategic congruence lead to similar execution or contributions to a mission.\(^{47}\) He describes the concept of cognitive interoperability as perhaps ontological – not yet actualized and existing mainly at the subconscious level and describes it as a composite of ‘cognition’ meaning ‘thinking’, and ‘interoperability’ meaning “thinking together to act together”.\(^{48}\)

As a strictly human function, cognitive interoperability requires six factors – awareness, understanding, communication, trust, planning, and action. Oliver argues that the cognitive level underpins all other levels of interoperability. The shift from a self-centered to a common mindset occurs through six non-discrete, non-exclusive stages of consciousness of the operating environment, vocational, awareness, tactical, operational, strategic, and perception.\(^{49}\) Each environment may encompass elements of the other stages of consciousness in the same time-space continuum.\(^{50}\) Oliver’s observation of the ‘myth of service superiority’ as a main barrier to cognitive interoperability is extrapolated by the author to ‘allies and partners’ and the myth of cultural superiority effected by technical superiority.

![Figure 4: Oliver's Cognitive Continuum to Human Interoperability](image)


\(^{47}\) Oliver, n.d., p. 2

\(^{48}\) Ibid

\(^{49}\) Ibid, p. 8

\(^{50}\) Ibid

\(^{51}\) Ibid, p. 6
2.3 Summary of previous research

NATO doctrine acknowledges the importance of interoperability. Several models and frameworks exist, each of which is focused on different aspects. Despite an increased emphasis on cognition in military cooperation, cognitive interoperability is not identified and needs further investigation. While Crowson and Rosson have investigated the operational and national level, to date, no framework for the military strategic or multinational level exists that sufficiently explains the interdependencies between cognitive and cultural factors and how they shape interactions and interests at the military-strategic level.

2.4 Research gaps and contribution

The research gap is how to conceptualize cognitive interoperability at the military strategic level and what a roadmap for the development of it in a multinational environment could look like. This gap pertains to culturally diverse military officers, varying degrees of cultural awareness, and lesser degree of strategic or doctrinal congruence than investigated by Rosson. The research contribution in the form of a qualitative comparative case study of senior military officers from the U.S., Sweden, the UK, South Korea, and Taiwan aims to understand roadblocks and gateways for the development of cognitive interoperability, and how experiences during the exercise inform the development of a framework.

Cognitive interoperability is vital for Swedish military officers who are going through a tremendous adaptation process in their national defense and military alignment strategy, and who will increasingly cooperate with culturally distal partners once in NATO, but also bilaterally with more proximal allies like the U.S. Likewise, U.S. military officers benefit from understanding the generative factors for cognitive interoperability, so that they can foster the cultural and interpersonal competencies that enable campaigning with allies and partners as envisioned in the NDS 2022, and in response to cognitive warfare efforts by its main adversaries.

Most military strategic research has an inherent great power or U.S. bias. Moreso, most scientific studies on culture and cognition are small samples predominantly from North America, Europe, and Australia called ‘W.E.I.R.D.’ (Western, Educated, Industrialized, Rich, and Democratic)52. Although this group constitutes an outlier globally seen, ‘W.E.I.R.D.’ study results are often generalized into universal themes. Focusing on U.S., Swedish, British, South Korean, and Taiwanese students, this study sets out to contribute with lesser-known perspectives to a more holistic, or multi-paradigmatic study of cognitive interoperability.

52 Fiske, Susan T. & Shelley E. Taylor, Social Cognition: From Brains To Culture (Los Angeles, CA, 2021), p.28 Link
3. THEORY

This chapter contains an introduction to the Western (research) paradigm and cultural dimensions, the applicable theories and frameworks, and a justification for their choices.

It is part of the human imperative that our cognitive abilities, originally designed for survival, are flawed. Our bounded reality is riddled with cognitive biases and stereotyping designed to make quick decisions, complete patterns, and differentiate between ingroup and outgroup. Second, our cognition holds cultural biases such as ethnocentrism, stereotyping, and value conflicts. Lastly, the U.S. and most Western militaries view the world through a Western (American) paradigm that postulates an objective reality, ‘linear’ causality, categorical thinking, rational decision making, and quantitative data verification tools. This world view inherently lacks an alternative or critical way of thinking that leverages complexity theory, advocates for multi-paradigmatic thinking over categorical thinking, and appreciates both physical and social facts in military planning. In sum, greater cognitive and cultural consensus requires ‘metanoia’, a radical, near ‘metaphysical’ shift of mind to transform ‘survival thinking’ into creative, ‘generative thinking’ aided by a keen understanding of behavioral science, cultural, and social theory.

![Figure 5: Multi-paradigmatic human domain (author’s adaptation)](image)

---

53 Martin, Grant G., Acting in the Human Domain, But Educating for the Physical Domains. How Professional Military Education is Failing to Prepare Soldiers to Affect Fundamental Change, Small Wars Journal, (17 June 2013), Link
54 Martin, 2013
56 Ibid
### 3.1 Intercultural theory

Cognitive interoperability happens through an interplay of cognition, culture, cooperation, and learning. One of the key ingredients, culture, is itself a complex phenomenon of collective sensemaking that can be viewed through many different lenses like anthropology, sociology, or psychology. Culture is a social construction of reality and constitutes shared cognitive frames of reference. Culture is fundamental to cognition, as its origin, its enhancer, and as an integral part of it. It can make the difference between soft power and military force, or the ability to co-opt versus coerce people.

The body of cultural theory research includes several hallmark studies like Hofstede’s **cultural dimension theory**. Despite the field’s early focus on W.E.I.R.D., cultural dimensions provide an access point to understand the impacts of cultural differences, and how culture determines cognition, decision-making, and reality itself, for example Western analytical, independent, and autonomous versus Eastern holistic, interdependent, and harmonious approaches. The following comparative overview of Swedish, U.S., South Korean, and Taiwanese cultural dimension scores highlight key differences.

![Hofstede's 6-D Model](image)

*Figure 6: Hofstede’s 6-D Model*

Sweden is an equal rights society which resorts to hierarchy only for convenience and communicates openly and in a participatory manner. Its highly individualistic society values work-life balance, consensus, and solidarity; conflict resolution takes place through compromise, negotiation, and long discussions. The cultural basis is ‘lågóm’, or ‘not too much, not too little’, or ‘everything in moderation’. Rules are flexible, deviance from norms tolerated, and innovation not considered a threat. Swedish society is optimistic, enjoys life and emphasizes leisure time.

---

57 Hofstede Insights, Country Comparison 6-D Model, [Link](#)
58 Ibid
59 Ibid
60 Ibid
The U.S. represents the ideals of ‘liberty and justice for all’, which is expressed in equal rights, informal and direct communication, geographic mobility, self-reliance and ‘manifest destiny’. American society values competition, achievement, and success, reflected in a ‘winner takes it all’ and ‘can do’ mentality that persists throughout life. Americans ‘live to work’, strive for upward mobility and higher status based on how good they can be. There is a general tolerance for ambiguity, new ideas, and technology. The U.S. is a normative, albeit pragmatic society, reconciling the notion of ‘work hard, play hard’.

South Korea is a hierarchical, collectivistic society with sincere commitment to the extended member ‘group’ and loyalty as the highest principle. Offenses result in ‘체면을 잃다’ or ‘losing face’. Conflict is resolved by compromise, negotiation, and consensus. Behaviors are guided by rigid conventions and beliefs, hard work and precision, and resistance to innovation. South Korea is one of the most long-term oriented societies worldwide. Life is guided by virtue, pragmatism, and longevity. Society exercises restraint, impulse control, and displays a tendency towards cynicism or pessimism.

Taiwan is a hierarchical, collectivistic society that is guided by codes and beliefs to avoid uncertainty. There is a preference for hard work, leveraging ‘关系’, or one’s ‘social network of relationships’, and a general resistance towards innovation. Taiwan is a pragmatic, long-term oriented society with traditions adapted to modern context, perseverance, and a respect for virtues.

What the scores do not capture is recent history and its impact on culture and national identity. Korea’s division in 1945 and North Korean regime hostilities are an enduring source of stress and instability for South Korea, which has resulted in adaptability, tenacity, and pragmatism infused with Confucian concepts of harmony and obedience. Taiwanese culture and national identity continue to be influenced by its relationship with China and the ‘one-China policy’. For Taiwan, it is important to distinguish between political disassociation on the hand, and shared ancestry, and language on the other hand.

Intercultural theory suggests that cross-cultural competence (3C) is comprised of knowledge, skills, and attitudes (KSA) that enable effective adaptation to diverse cultural environments. Knowledge is general and culture specific, skills entail both cognitive and behavioral competencies. KSAs need to be present for someone to have a degree of 3C. A working definition is “the ability to quickly and accurately

---

61 Hofstede Insights, Country Comparison 6-D Model, Link
62 Ibid
63 Ibid
64 Ibid
65 Ibid
66 Ibid
comprehend, then appropriately and effectively engage individuals from distinct cultural backgrounds to achieve the desired effect; despite not having an in-depth knowledge of the other culture, and even though fundamental aspects of the other culture may contradict one’s own taken-for-granted assumptions/deeply-held belief”. The following composite model illustrates both trainable and stable KSAs.

Figure 7: Rosenthal’s et al Composite Perspective Taking Model (author’s adaptation) 69

3.2 Cooperation theory

Human collaborative (prosocial) skills and group-mindedness are expressed in cultural conventions and institutions, which are characterized by ‘collective intentionality’. 70 The ‘cultural group selection hypothesis’ posits that cooperative groups will outcompete other groups, and that the altruistic qualities, which lead to group success are perpetuated culturally as opposed to genetically. 71 Meanwhile, the interdependence hypothesis assumes that collaboration initially occurred for survival, which lead to altruistic attitudes towards collaborative partners. 72 Regardless of the origins of altruism, the necessity for large group coordination and social selection led to the formation of group-mindedness and group-

71 Tomasello et al, 2012, p. 673
72 Ibid, p. 674
identity which is expressed in shared conventions or behavioral (cultural) practices. Group-mindedness thus transforms into ‘collective intentionality’, defined as “the power of minds to be jointly directed at objects, matter of fact, states of affair, goals, or values”. The main challenge from a philosophical viewpoint lies in ascribing attitudes to individuals as a group.

Humans exercise cooperative flexibility with unfamiliar individuals by paying a personal cost such as time, money, resources, or efforts to provide a benefit to another individual or group of individuals. The cost is usually smaller than the benefit it creates. Despite conflicting individual and collective interests (‘prisoner’s dilemma’), cooperators can outcompete noncooperators through the long-term payoff of cooperation (‘direct reciprocity’). A good reputation is earned through previous cooperation with others, making future cooperation more likely (‘indirect reciprocity’). Cooperation requires collaborative attributes like communication skills, selflessness, and self-awareness.

Truly costly cooperation can be explained by the empathy-altruism hypothesis which describes empathy as a human response to take another person’s perspective. Seemingly irrational cooperation with no ultimate (long-term) explanation can be understood with the social heuristics hypothesis of ‘dual process’, which describes the interplay of two types of thinking, one being fast, intuitive, and affective, and the other slow, controlled, and deliberate. Successful cognitive strategies become automated into default prosocial responses; however, social heuristics are flexible and change with experience. At the institutional level, organizations are designed to incentivize good behavior and promote trust in cooperation. The social heuristics hypothesis helps explain the role of trust and how the quality of institutions in different societies influences whether individuals are cooperative and trusting. Effective institutions reflect cooperative norms and the rule of law, which creates a safe environment for cooperation.

---

73 Ibid, p. 676
75 Schweikard and Schmid, 2021
77 Jordan et al, 2014, p. 87
78 Ibid, p. 90
79 Tomasello et al, 2012, p. 679
80 Kahneman, Daniel, Thinking, Fast and Slow, (Macmillan, 2011)
81 Jordan et al, 2014, p. 93
82 Ibid, p. 94
3.3 Alliance theory

Lastly, in international relations theory, and specifically alliance theory, the concept of military cooperation is a complex social phenomenon that can be viewed as “a set of strategic decisions meant to make the state more secure”.\(^8^3\) States cooperate and enter alliances to effect desired foreign policy outcomes or end states such as deterrence. The choice of policy depends on the context and is “a function of a dyad’s latent propensity to cooperate”.\(^8^4\) The higher the level of cooperation, the more integrated and frequent the corresponding policies.\(^8^5\) Alliances are characterized by cooperation on vital issues such as national security and “a pledge to behave in a certain way in the event of war”.\(^8^6\) Cooperation is the process in which “actors adjust their behavior to the actual or anticipated preferences of others, through a process of policy coordination.”\(^8^7\) Military cooperation can be institutional (alliances) or behavioral (events). It describes the adoption of a policy between two states that intends to reduce a third state’s military power, enhances at least one state’s military power, or coordinates military activities that benefit at least one of the states.\(^8^8\)

3.4 Relevance

To develop cognitive interoperability, several conditions must be met: First, in addition to vocational skills, and self-efficacy, both agents must possess cross-cultural competence. Cultural dimension theory combined with intercultural theory predict that this competence enables both agents to overcome the human imperative, meaning their cognitive and cultural biases, to develop ambiguity tolerance, awareness, and empathy towards a more common view. Second, premised on cooperation theory, a common view and shared perceptions enable collective intentionality articulated as shared interests and outcomes that overwrite conflicting motives and other differences. Third, military cooperation theory describes how organizations like NATO or educational institutions like SDU and JAWS create a safe environment that incentivizes cooperation and allows its members to internalize irrational cooperation as a default strategy to be applied in future situations. Altogether, these theories inform the concept of cognitive interoperability.

---


\(^{84}\) D’Orazio, 2016, p. 52

\(^{85}\) Ibid

\(^{86}\) Ibid


\(^{88}\) D’Orazio, 2016, p. 58
4. METHOD

This chapter contains the research design, the empirical data collection methodology, ethical considerations, the credibility discussion, and the operationalization of the interview questions.

4.1 Research design

The research is designed as a qualitative single case study to investigate a real-life phenomenon, cognitive interoperability in one iteration of a combined strategic appraisal exercise, in depth and within its context, the PME environment, where the boundaries between the phenomenon and context are not clearly defined. The unit of analysis is a group of 20 senior, multinational officers whose interactions and experiences were collected as empirical data. The case study investigates the concept of cognitive interoperability in a ‘technically distinctive situation’. It includes multiple sources of evidence (observation, data analysis, interviews) for triangulation and comparison. Lastly, the case study developed ‘theoretical propositions’ prior to data collection and analysis, operationalizing aspects of intercultural theory and cooperation theory.  

---

Figure 8: Research Design

---

89 Yin, Robert K., *Case Study Research: Design and Methods* (Los Angeles, 2009), p. 18
90 Yin, 2009, p. 18
4.2 Empirics

Setting and Participants

National Defense University’s Joint Advanced Warfighting School (JAWS) is a one-year PME program for graduate level education focused on strategy and policy designed for senior military officers and government civilians (Colonel select or equivalent). The exercise consisted of 37 participants.

Figure 9: JAWS Mission

SDU’s senior graduate level officer PME, the Joint Advanced Command and Staff Program (JASCP), is a two-year program for senior Captains and Majors. The exercise consisted of 75 Swedish military officers from all branches of service, and 4 international students from the U.S., South Korea, Brazil, and Germany.

Figure 10: JAWS Student Population

Figure 11: JACSP Mission

---

91 National Defense University (NDU), JAWS Welcome Brief (Washington D.C., 2023), slide 3
92 NDU, 2023, slide 4
93 Swedish Defense University (DDU), JACSP Welcome Brief (Stockholm, Sweden, 2023), slide 20
This combined exercise occurs once a year and was in its third iteration. It covered a three-day portion of the 12-month curriculum. Participants conducted reviews of three key regions (Baltic Sea region, Black Sea region, Arctic region); applied theories, models, and methodologies to define the problem, current, and desired conditions; and delivered a brief with their strategic NATO-level assessment to Supreme Allied Commander Europe (SAEUR). 

Participants were selected for interviews, and observations via convenience sampling based on who was available and willing to participate. The observation occurred in the classroom primarily with the author's small group focused on the Baltic Sea region and included scheduled observation of key briefs and casual conversations. The document analysis included scripts, the final presentation to SACEUR, and an after-action review. For interviews, the author received approval from the staff in accordance with DoD and Swedish Ministry of Education policies. Participant recruitment was pre-coordinated by email and in person. During the exercise, students were provided with information, consent forms, and the author’s contact information. This resulted in 20 participants, 9 JAWS and 11 JACSP students.

Data Collection

One pilot interview was conducted to ensure that the interview questions were pertinent and easy to understand. In total, 20 interviews were conducted for data saturation. All interviews were conducted in English via ‘zoom’ video conference within two weeks of the exercise. The interviews were recorded as audio and video files and transcribed using ‘rev.ai’ transcription software. The transcripts were manually optimized for CAQDAS processing utilizing ‘atlas.ti’ which is a qualitative analytical research tool for coding and data visualization with both artificial intelligence (AI) and manual coding methods.

![Interviewee Gender](image)

**Figure 12: Interviewee Gender**

96 See: [https://www.rev.ai/](https://www.rev.ai/)
97 See: [https://atlasti.com/](https://atlasti.com/)


**Interview Questions**

There were two versions of the handout for JAWS and SDU participants respectively. Questions 1 and 2 were background knowledge question about demographics and previous bilateral or international training and education experience. Question 3 explored the respective military culture, preparations for the encounter, and ‘lessons learnt’ from it. Question 4 investigated vocational knowledge including respective armed forces, strategic doctrine and outlook, and military capabilities. Question 5 probed for changes in vocational knowledge and newly acquired knowledge. Question 6 researched challenging and rewarding experiences related to the respective student populations. Questions 7 and 8 examined cross-cultural competence development during the exercise and in multinational work environments. Question 9 was ranking the importance of the three cross cultural competency categories, knowledge, skills, and attitudes. Question 10 studied the development of cognitive interoperability during the exercise. Question 11 sought other variables that determine cognitive interoperability such as common views, shared goals, and differences. Question 12 explored the role of training and education in
developing cognitive interoperability. Question 13 examined perspective-taking skills. Question 14 was open for complementary topics sparked by the previous questions. Questions 15 was a ‘catch all’ for any additional reflections.

Data analysis

As a general strategy, the author followed two of the five analytical techniques most suitable for novices, ‘pattern matching’ and ‘explanation building’.98 The interviews were assigned codes to identify important concepts within the responses, allowing the author to derive themes and patterns based on the subjective experiences of the interviewees. No codes were developed prior the analysis to remain flexible and open-minded. For coding, the author combined manual, and AI Beta coding. Substantive effort went towards adding, removing, merging, splitting, and changing codes while iteratively working through the data in an inductive fashion. The author further explored the coded data looking for conceptual relationships, code co-occurrence using cross-tabulation, and sentiment analysis. Several data visualization techniques such as bar charts and network diagrams were also used.

Researcher’s Role

The author’s background and previous experiences have a direct impact on this study. The author serves on active duty in the U.S. Marine Corps. She has 14 years of time in service both as enlisted and officer. She worked and studied with allies, partners, and the interagency in multinational environments in Afghanistan, Japan, and Sweden. Prior to serving in the military, the author lived in Western, Eastern, and indigenous cultures such as Denmark and Germany; China and Japan; Greenland, and Hawaii. The author has a keen interest in the research subject and a profound passion for her profession.

From an ontological point of view, this multitude of experiences and diversity in background likely reduce culture-specific bias brought into the study, while familiarity with Swedish culture and doctrine enables the author to consider Swedish perspectives during the interpretation of the interview data. From an epistemological point of view, she is part of the profession of arms and able to make sense of military idiosyncrasies. From an axiological point of view, the author’s values, experiences, and world view shaped the interactions informing this study. The values found in her military culture, such as service to nation, honor, courage, commitment, and selflessness, may not be present in other cultures to the same degree or differ altogether. The author’s methodological assumption is that a strategic appraisal exercise and the participants’ expressed experiences are well-suited as a case study for the development of

---

98 Yin, 2009, pp. 136
cognitive interoperability given the underlying social constructivist and interpretive assumptions that knowledge develops through social encounters, interaction, and learning.  

### 4.3 Ethical considerations

Research ethics were consistent with DoD policy and Swedish Ministry of Education policy. Interview participation was strictly voluntary, and the interviewees’ identities were kept confidential. Electronic data was stored securely and will remain stored in accordance with applicable policy. The informed consent form reminded interviewees to discuss unclassified information only. Whether students participated in the interviews and how they answered the interview questions was in no way tied to their academic standing or future assignments.

### 4.4 Trustworthiness

Trustworthiness, which is the equivalent of reliability and validity in quantitative research, was established through the pilot interview and test recording with a senior U.S. military officer. Credibility was achieved through data triangulation to minimize bias and maximize the soundness of the coded themes. To further the study’s credibility, students from both JAWS and JACSP are represented as equally as possible. The interviewees were selected based on the most diverse demographics available. Transferability, or the usefulness of the collected data and insights for other research, is achieved by presenting the exact circumstances of the case study. Moreover, by explaining how the theories are operationalized, how the research and the analytical process are conducted, what methodological limitations exist, and by providing a coherent and ‘thick’ narrative of the findings in support of the study’s conclusions, the study has transferability and thereby a higher degree of credibility.

---

100 U.S. Department of Defense, “Protection of Human Subjects and Adherence to Ethical Standards in DoD-Conducted and -Supported Research” (DoD Instruction 3216.02), (2012), [Link](#)
101 Utbildningsdepartementet, “Lag (2003:460) om etikprövning av forskning som avser människor”/“Ethical Review of Research Involving Humans” (Stockholm, 2003), [Link](#)
102 Creswell & Poth, 2018, pp. 202
4.5 Operationalization of theories

The following table illustrates the connection between the research questions, the identified variables, and the empirical interview and observational data designed to answer the questions.

*Table 1: Operationalization*

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Factor</th>
<th>Theory</th>
<th>Variable</th>
<th>Interview Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roadblocks</td>
<td>Intercultural</td>
<td>Cognitive bias</td>
<td>6, 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stereotyping</td>
<td>6, 11 + observation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ethnocentrism</td>
<td>6, 11 + observation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Language ideology</td>
<td>6, 11 + observation</td>
</tr>
<tr>
<td>2</td>
<td>Gateways</td>
<td>Intercultural</td>
<td>Knowledge</td>
<td>2, 3, 4, 5, 9 + analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooperation</td>
<td>Thinking Competencies</td>
<td>5, 9, 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Awareness (self / other)</td>
<td>6, 9, 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Attitude</td>
<td>6, 9 + observation</td>
</tr>
<tr>
<td>3</td>
<td>Framework</td>
<td>Intercultural</td>
<td>Individual – vocational</td>
<td>2, 3, 4, 5, 11 + analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alliance</td>
<td>Cultural – 3C</td>
<td>7, 8, 9, 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Organizational - cooperation</td>
<td>10, 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Policy - doctrine</td>
<td>10, 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Context - geostrategic</td>
<td>11 + analysis</td>
</tr>
</tbody>
</table>
5. Results and analysis

This chapter contains the findings and analysis related to the participants, the results, and the responses to the research questions.

5.1 Participants

The interview participants ranged in age from 37 to 56 with 15 to 33 years of military service. The differences between the U.S. promotion system of “up or out” and the Swedish system mean that participants’ age and time in service do not lend themselves to a direct comparison. All U.S. students had command experience, compared to less than half of the Swedish students. Both the U.S. and Swedish participants came from diverse military occupational specialties. The UK and Taiwanese officer had also been in command at battalion level or equivalent.

Table 2: Semi-structured interview JAWS demographics

<table>
<thead>
<tr>
<th>Interview</th>
<th>Gender</th>
<th>Age</th>
<th>Nationality</th>
<th>Branch</th>
<th>Specialty / Key billets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>46</td>
<td>U.S.</td>
<td>U.S. Marine Corps</td>
<td>- Infantry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- BN Commander, Light Armored Reconnaissance</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>43</td>
<td>UK</td>
<td>British Royal Navy</td>
<td>- Naval surface warfare officer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Cdr Type 23 Frigate (Duke class)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Planning staff Litoral SHD Group</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>42</td>
<td>U.S.</td>
<td>U.S. Marine Corps</td>
<td>- Aviator</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- BN Cdr. Medium Tilt Rotor Squadron (MV-22 Osprey)</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>42</td>
<td>U.S.</td>
<td>U.S. Army</td>
<td>- Strategic Advisor in the Office of SecDef</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Chief of Staff for 2022 National Defense Strategy Review</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>42</td>
<td>U.S.</td>
<td>U.S. Space Force</td>
<td>- Intelligence (prior U.S. Air Force)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Commander Space Analysis squadron, National Air &amp; Space Intelligence Center</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>44</td>
<td>U.S.</td>
<td>U.S. Army</td>
<td>- Engineer / Combat Advisor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- BN Cdr. Security Forces Asslt. Brigade</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- BN Cdr. Engineers, Combat Effects</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>49</td>
<td>U.S.</td>
<td>U.S. Air Force</td>
<td>- Logistics planner</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- U.S. CENTCOM Branch chief J-4S, Iran branch</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>49</td>
<td>U.S.</td>
<td>U.S. Marine Corps</td>
<td>- Ground Supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Inspector Instructor for Combat Logistics Battalion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- BN Cdr. PATRIOT Air Missile Defense</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Air Force Planning staff (A-5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- U.S. country-to-country sales</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>45</td>
<td>Taiwan</td>
<td>Republic of China Air Force</td>
<td>- Interim FOM at Canadian Forces College in Toronto</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Internet applications, user experience testing, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Annual discussion with U.S.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Technical support to Singapore training / exercise near Taiwan</td>
</tr>
</tbody>
</table>

24
Table 3: Semi-structured interview JACSP demographics

<table>
<thead>
<tr>
<th>Interview</th>
<th>Gender</th>
<th>Age</th>
<th>Nationality</th>
<th>Branch</th>
<th>Specialty / Key billets</th>
<th>TIB</th>
<th>Rank</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>41</td>
<td>Sweden</td>
<td>Swedish Army</td>
<td>- Infantry, Ranger, CBRN - Chief of Operations / Chief of Plans, CBRN Defense Center</td>
<td>24</td>
<td>Maj</td>
<td>- International cooperation w/ U.S., Canada, UK - Annual interaction, unit-to-unit level</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>47</td>
<td>Sweden</td>
<td>Swedish Army</td>
<td>- Equipment support &amp; logistics - Deputy/Chief of Staff Lifeguards Regiment</td>
<td>25</td>
<td>Maj</td>
<td>- Swedish Homeland Territorial Defense - Live exercise with U.S. Minnesota National Guard</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>45</td>
<td>Sweden</td>
<td>Swedish Navy</td>
<td>- Naval surface warfare officer - Cmdr of naval vessel - Add to Swedish royal family</td>
<td>25</td>
<td>LiCmrd</td>
<td>- Multinational exercises with partners - Exchanges and cooperation</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>39</td>
<td>Sweden</td>
<td>Swedish Air Force</td>
<td>- Aviator - AWACS pilot - C-17 Navigator</td>
<td>17</td>
<td>Capt</td>
<td>- Training at Altus AFB, Oklahoma - Multinational 'Open Skies' training - KFOR Deployment</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>38</td>
<td>Sweden</td>
<td>Swedish Marines</td>
<td>-Staff Officer G-17 / Plans - Company Commander, Marine Rifle Company</td>
<td>19</td>
<td>Capt</td>
<td>- BALTOPS w/ U.S. Marine Corps - Multiple Archipelago Endeavor w/ U.S. Marine Corps, planning &amp; execution</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>50</td>
<td>Sweden</td>
<td>Swedish Air Force</td>
<td>- Intelligence officer - Exercise planning - Instructor at officer academy</td>
<td>28</td>
<td>Maj</td>
<td>- United Nations mission - International assignment at U.S. Army Garrison Yongsan, South Korea</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>37</td>
<td>Sweden</td>
<td>Swedish Logistics</td>
<td>- Logician - Chief of a Technical Department for joint service support</td>
<td>15</td>
<td>Capt</td>
<td>- 3 x Afghanistan deployment (RAF) - Mostly national / tactical, light maintenance</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>56</td>
<td>Sweden</td>
<td>Swedish Air Force</td>
<td>- Intelligence, surveillance - Chief of Staff for communication and information technology unit</td>
<td>33</td>
<td>Maj</td>
<td>- Translator for Swedish Defense Administration for Material &amp; Equipment - Cooperation with U.S. (NATO PRD)</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>40</td>
<td>Sweden</td>
<td>Swedish Navy</td>
<td>- Intelligence / Strategic planner - Leader of defense planning at policy &amp; plans department at SheAF Headquarters</td>
<td>21</td>
<td>LiCmrd</td>
<td>- Joint Maritime Exercise 'Joint Warrior' - KFOR deployment with U.S. forces - Coastal anti-piracy 'Operation Atlantis'</td>
</tr>
</tbody>
</table>

5.2 Results

The data analysis consists of 20 hours of observation of 24 participants during the strategic appraisal exercise like participant small group discussion, informal conversations, and the large group presentation to SACEUR. Document analysis included the small group final briefing products to SACEUR (scripts, PowerPoint slides), and the JAWS AAR. 20 semi-structured interviews were conducted with 10 Swedish, seven U.S, one UK, one South Korean, and one Taiwanese participant who responded to 15 questions. AI coding of the transcribed documents resulted in 27 code groups and extensive subcodes for a total of over 752 codes. The researcher manually reviewed, merged, and split the proposed codes into five main categories with 34 subcategories in accordance with the following model.
The following is a simplified graphic that depicts the themes and main categories across all 20 interviews:

Figure 18: Coded Themes and Main Categories

---

The Swedish perspective

The case study focused on multinational military officers conducting a combined strategic appraisal exercise. Amongst the Swedish participants, the most prominent themes related to cognitive interoperability were (1) military strategic planning, (2) regional versus global perspectives, (3) alliance membership, (4) self-doubt, and (5) U.S. professionalism.

Regarding **military strategic planning**, the U.S. uses three related national security documents. The National Security Strategy (NSS) articulates U.S. vital, major, and peripheral interests; the National Defense Strategy (NDS) articulates the strategic aims of the DoD; and the National Military Strategy (NMS) articulates the attributes, functions, and capabilities for joint warfighting. The U.S. senior officers were intimately familiar with the priorities articulated in these documents. Swedish interviewee 1 observes:

>“How U.S. doctrine and the political guidelines are always present in every decision making on the strategic level, that was new to me and a fascinating find. I don't think we have that in the same sense in Sweden and that is something to pick up on [...] I do not feel that we in Sweden have the same natural connection there. I do feel that the military might be disconnected somewhat from the political decision-making process.”

Meanwhile, the first ever Swedish military strategic doctrine was authorized in 2002 to integrate Swedish military thinking into Western military discourse. Swedish officers were not as familiar with navigating between policy, national strategy, and military strategy as U.S. officers, nor used to identifying military problems and determining how to best apply military force. Swedish interviewee 6 observes:

>“This is one of the big cultural differences between the U.S. and Sweden [...] that we in Sweden don’t have a culture or a norm to work with doctrines. Doctrines are new to us. I think our first document was in the 2000s and something like that. So that’s a new way for us to think and work, and our national defense strategy is likely still flawed [...] I would say that maybe one thing which I think refers back to our Swedish culture or rather non-culture of doctrine or defense strategies [...] We, Swedes believe that strategy is for Generals. They will break it down to operational plans and pass it to lower Generals to

---

104 The President of the United States, “U. S. National Security Strategy” (Washington, D.C., 2022), [Link](#).

Colonels who will give orders, and orders will follow down the hierarchy. So maybe that was one of the big lessons or eye openers. Even Colonels or Lieutenant Colonels discuss strategy in that kind of way.”

Strategic thinking is the ability to leverage one’s military experience and education to solve military strategic problems but also to ask the right questions and identify the right problems in the first place. Strategy-making is not a straightforward or linear process and strategic objectives are not always clear. Moreover, the differences between U.S. and NATO doctrine were not readily apparent to the Swedish students and often perceived as one and the same (Swedish interviewee 10).

Regarding alliance membership, NATO doctrine ensures a common language, both for the ‘Partnership for Peace’ program and international missions. Several Swedish participants conceptualized NATO as a means to exercise U.S. foreign policy, rather than an organization of collective intentionality. This sentiment co-occurred with concerns over Sweden’s ability to strike the balance between advocating for its national interests and providing alliance support upon membership approval. Swedish interviewee 2 elaborates:

“That will also mean that if someone is pushing their country's agenda versus an alliance agenda, that would degrade the cognitive interoperability because you are not necessarily talking about the same things. So, I think if you are working within a NATO context, everyone has to buy in and actually work in that concept. And that's something that's Swedish people have a hard time accepting that there are alliance agendas as well as national agendas. We are not good at pushing our national agenda if there is one, we go all in on the alliance and therefore we might lack understanding that there are other ways of conducting your day-to-day business and drive your national interests. [...] And if you have a nation that goes into a bargaining and does not give in, Swedes will give in, but other parties might stand their ground firmer because they have their agenda which may not be the best for the alliance as their first priority. So that's something that I think will be a hard lesson for Sweden within the next 20 years or something.”

The above opinion was echoed by Swedish interviewees 6 and 8, who reckoned that the U.S. view on NATO as ‘a tool to use’ rather than ‘a club or alliance’ is ‘natural’ in one way and ‘not scary’, but also ‘a little disturbing’, ‘eye-opening’, and ‘shocking’ revelation implying that ‘a realistic perspective’ is needed moving forward as U.S. problems will then also become ‘Swedish problems’.

On the other hand, NATO membership is perceived as a positive in that it enables integrated deterrence. Most Swedish students had a fuzzy concept of deterrence in general. Swedish interviewee 1 points out:
“The U.S. can basically do deterrence by punishment, which is not something that Sweden can do, at least not to the enemy that we are training for, right? So that is a whole new dimension of strategy that we can consider having the U.S. as an ally and the openness in discussing that dimension was kind of the key take away.”

The difficulty of integrating the military element of national power with the other elements to achieve integrated deterrence was addressed by Swedish participant 2:

“It was interesting because they also talked about “integrated defense”, it means that you expand your view, maybe not only talk about the military as Sweden’s means. We used the ‘DIME’ model, so also diplomatic, informational, economic, and military aspects as a way of making a strategic assessment. And that also ended up resulting in our recommendations being outside the military realm. And that was somehow difficult to sell to the [...] Supreme Allied Commander Europe because the task wasn’t actionable with his resources, which was part of the problem. So, there is a contradiction in the DIME model, I think. We as the military want to be integrated, but we cover the military aspects only, so where are the other assets to impact the other aspects of the DIME model?”

Most Swedish students also highlighted the differences between regional and global strategic perspectives. On the individual level, the near total dissolution of the Swedish Armed forces following the 2004 Defense Proposition, and the lack of experience and integration with NATO translated into common Swedish feelings of self-doubt, underestimation, dependency, and smallness. Cultural aspects of national identity such as humbleness, conflict avoidance, consensus, conformity, low degree of competitiveness, and collective shyness were perceived as a cognitive limitation compared to the competitiveness, ‘performance’ focus, sense of ‘urgency’, and ‘assertiveness’ in the U.S. officers (Swedish interviewee 3). Swedish emotions ranged from a lack of confidence and shyness to uncertainty, anxiety, fear of failure, and overthinking (Swedish interviewee 5). These feelings often co-occurred with a lack of experience with doctrine, or lack of previous interactions with U.S. officers. Conversely, Swedish feelings of confidence co-occurred with high English language proficiency, education, and real-life operational experience.

Meanwhile, U.S. officers were unanimously described as outgoing, expressive, extremely professional, highly experienced both academically and operationally, with high teamwork affinity and social skills. Swedish participants unanimously described a sense of positive surprise and even shock about how positive they experienced the collaboration with their U.S. counterparts, who were further characterized as ‘dynamic’, ‘inclusive’ and ‘open-minded’ (Swedish interviewee 5), with the ability to switch between an unexpectedly ‘humble’, ‘cooperative’ demeanor and ‘sharp’, ‘goal-oriented’ productivity (Swedish
interviewee 10). In effect, a process of stereotype and prejudice removal founded in Swedish misconceptions of U.S. officers took place for most Swedish participants. Interestingly, the stereotypical thinking often co-occurred with a lack of knowledge of U.S. military strategic doctrine and outlook, military culture, and capabilities or some diffuse ideas perpetuated by the news media or Hollywood movies.

The major benefit of this combined exercise for Swedish participants resides in a radical perspective taking experience trading a narrow regional perspective for a global U.S. perspective, which sparked the realization that in an interconnected and globalized system of systems Sweden must redefine its military strategy and reorient itself to create an advantageous position in stride with geo-political realities, which are metamorphosing in front of our eyes. Most Swedish participants realized that what they consider 'strategy' is merely a regional or theater issue for the U.S. who handles multiple strategic problem sets at once. This implies a mutual burden to understand narrow and broad strategic views. Swedish participants developed a deeper appreciation for the expectations and responsibilities of U.S. global leadership and acknowledged the need for Sweden to move beyond the European context in its strategic outlook, alignment, and doctrinal scope. Within the PME context, Swedish participants pointed out that most of the scenario discussions at JACSP focused on the Baltic Sea region only and recommended more diverse scenarios in different theaters that account for diverse political and economic perspectives and replicate NATO dynamics.

Teamwork was the foundation for common ground based on a shared interest in the rule-based order and democracy, while tolerance and an open climate aided in putting cultural differences aside and placing people above nationalities. Combined with critical thinking, intellectual curiosity, and the willingness to bridge cultural gaps to learn together, this collaborative environment allowed for empathy and mutual perspective taking, accounting for historical experiences, geostrategic exposure, and national and military cultural identity.

The U.S. perspective

Amongst the U.S. participants, the most prominent themes related to cognitive interoperability were (1) partners and allies, (2) military culture, (3) Swedish values in the international context, (4) cultural differences, and (5) creativity and innovation.

Regarding partners and allies, the U.S. students unanimously consider Sweden a capable and willing partner. Several U.S. officers lacked awareness of Sweden’s participation in several international missions to include reconstruction teams in Afghanistan. The U.S. officers learnt Swedish perspectives on
NATO membership such as the sense of uncertainty and concerns over the demands that membership will place on growth, readiness, and integration. A shared realization was that U.S. assumptions about allies and partners are not always accurate, particularly pertaining to partner values and national interests, which do not always align with U.S. interests. Through perspective taking, U.S. officers came to better appreciate current events within Sweden’s historical and geographical context. U.S. interviewee 4 explains:

“I think understanding as we go forward and enhance our deterrence posture, these concerns for the U.S. are more conceptual than for some allies and partners who are right there on the front line […] I think that we cannot make assumptions about our allies and partners. And by that I mean we cannot always assume that they'll perfectly align with us. And so understanding not just their cultural backgrounds or national backgrounds, but their values, what their interests are as a nation, and then seeing how we align with them going forward. ”

This increased awareness of the national interests, the context, and the size of the Swedish Armed Forces in relation to the threat also led to a greater self-awareness as far as how large the U.S. Department of Defense really is and what the U.S. global presence truly signifies. Key to overcoming these different outlooks is strategic empathy. U.S. interviewee 5 discusses:

“I think strategic empathy is probably one of the most important skills to have because I think that's what gives you the ability to look through somebody else's eyes and stop for a moment and think about things from their position […] But I like when the South Korean pilot talks about having to be on alert all the time, because you never know what's coming across the border. When we ask our partners to do things with us, if we don't have that empathy for them, I think it's very easy to burn people out. And if you burn out an ally or a partner, you start creating the cracks that can lead to resentment, that can relate to decoupling of friendships, which is the opposite of what you want if you're trying to build and maintain the order that we have globally right now. ”

Several U.S. officers pointed out that strategic empathy needs to go both ways meaning that Sweden must also try to acknowledge the complexity the U.S. is dealing with globally. Nonetheless, when it comes to solving partner problems, U.S. participants emphasized that this should be done with partner solutions. A common U.S. blind spot is to fall in love with our own plan and capabilities as opposed to considering alternative, perhaps more sustainable ways of solving a problem based on partner capabilities. Interviewee 6 elaborates:
“Sometimes in the U.S., we think we’re good at everything and then once put to the test, we’re not so good at that. So, moving forward, I think it’s always important to know the capabilities of all your partners. So, when you go into a joint environment, a multinational environment, you can apply the appropriate resources from countries towards a specific end. And that’s not necessarily how we plan, but that’s really how we need to plan. Because that’s how we want to fight. That’s how we say we want to fight, but it hasn’t resonated yet into the overall planning process at the joint level.”

Related to that is the U.S. assumption that Sweden naturally follows U.S. doctrine. Due to Sweden’s unique context, U.S. doctrine does not carry over seamlessly and must be tailored to the specific context. U.S. interviewee 6 expresses:

“Well, just because a doctrinal document has a U.S. flag on it doesn't mean it's always right. It serves our purpose and I think it's a standard bearer for a lot of countries, but you just can't copy and paste and take it out of the U.S. and put it into Sweden. It has to be tailored based on the overall capabilities and needs and strategic outlook of their country. I don't know how the U.S. would change its policy if we lived right next door to a bad actor, if you will. But it is interesting how we have more of an aggressive outlook, but we're further away. But there's maybe more of, I don't like to use the word passive, but I would say a softer approach when you're located closer to a state actor just trying to prevent escalation.”

The U.S. officers pointed out Sweden’s resourcefulness in facing an adversary with overwhelming military capabilities, and that despite its small numbers, the Swedish military has demonstrated proficiency which, along with its will, drive, and motivation, is a building block of trust that creates reciprocity in wanting to work together. Being able to ‘punch above its weight’ means that Sweden as a potential partner can make a real impact (interviewee 7). Sweden should not underestimate its contribution and capabilities.

U.S. participants observed the lack of military culture as a strong Swedish subculture, which makes the Swedish officers’ professionalism, motivation, and drive for self-improvement even more noteworthy. Another striking difference was found in Swedish values and the emphasis on international law. U.S. interviewee 3 comments:

“The Swedes kept looking at a legal framework for action. So, what were the existing international treaties or biding international documents that structured the international order in a particular area for us, [...] whereas that was something that myself and the other American officers, we were just like whatever. We don't pay attention to that. So, it reinforced to me as we work with our allies and partners,
understanding the framework and the structure of the international order that we care about, that I felt our Swedish partners were much more in tune with than many of us on the American side of the house.”

U.S. participants unanimously commented on their own lack of knowledge of Swedish military strategic outlook and doctrine, ignorance, stereotyping, and lack of cultural understanding. Despite increased awareness, several participants continuously equated experiences with Norway or Finland in explaining their observations about Sweden and went as far as to assume similarities in doctrine, capabilities, and TTPs (U.S. interviewee 1, 3). Even though the lack of cultural understanding was named as a major lesson learnt during the Global War on Terror, it is still not fully internalized. Interviewee 4 explains:

“So, from the cross-cultural competence, I was guilty of this when we started going into this, assuming that the Swedes are from the northern part of the European continent, so it's going to be almost German, how things are handled. And I was wrong about that which is why we had to completely redo the plan of attack for the exercise. Despite the fact that I had spent time reading about the culture, I still missed that somehow.”

Cultural differences as barriers co-occurred with a lack of subject matter expertise and a lack of cross-cultural awareness. One U.S. participant was particularly ‘underwhelmed’ with his working group, specifically the lack of participation by his Swedish counterparts, which he stated was common feedback from the U.S. colleagues. He described disappointment over disconfirmed expectations such as the lack of urgency in his group. He attempted perspective taking by hypothesizing the reasons for this. Despite demonstrated self-awareness of his own bias and expectations, in the absence of cultural knowledge, his rationalization attempts fell short in salvaging the experience. U.S. interviewee 2 describes:

“I don't think it was just more of a preparation and an organization piece than it was maybe a cultural thing because we had plenty of good conversation. But some of the best conversation wasn't about the Arctic or the military topics at hand. […] That's fun to talk about but doesn't really answer the mail as in fulfil the requirement when you have to put together a strategic appraisal for the Arctic […] I found it hard to push them to where I wanted them to go, it was like “pushing the rope” […] I was questioning what we might be able to accomplish in the future given the cultural differences. I don't question our ability to communicate or get along, but certainly I'm wondering what is within the realm of possibility going forward.”

The participant acknowledged that his experience may not be representative as he found himself positively surprised by the Swedish level of proficiency and expertise in the larger brief to SACEUR. Moreover, his interactions with Swedish Marines during the social event were unlike those with his working
Interestingly, putting a premium on solving the exercise task co-occurred with disappointment whereas putting a premium on the personal encounters co-occurred with a sense of gratification. Positive group reflections co-occurred with a high level of multinational experience and cultural expertise that allowed U.S. officers to anticipate cultural differences and hold back type A personalities, U.S. interviewee 5 describes:

*And I think that maybe some biases or stereotypes against the U.S. such as “they know everything”, “they're hard chargers”. We, Americans are always looking forward, not looking backwards and maybe we are too cocky […] It wasn't anything that had to do with the Swedish students. Had everything to do with my biases and how I operate. I am American. I wanted to take charge of the small planning team. I quickly recognized my behavior and was like I need to pull back just my methodology in a way that facilitates overall teamwork.”*

Most U.S. participants admired Swedish **creativity and innovation**, resourcefulness, and the ‘growth mindset’ described as a ‘stretching experience’ (U.S. interviewee 4). These attributes were considered major advantages in future conflict (U.S. interviewee 1). In addition, the Swedish desire for self-improvement, knowledge, and attention to detail were perceived positively across the board. Lastly, U.S. students applauded JACSP as Sweden’s investment in its military job force. Recommendations included more experience-based learning opportunities, and travel to Sweden to alternate between locations for the combined exercise.

**The UK perspective**

The UK interviewee highlighted the differences in strategic perspectives between the UK and Sweden despite being fellow European nations. Prior to the exercise, the strategic importance of the Swedish island of Gotland and the demilitarized Åland islands had not been self-evident to the interviewee despite extensive naval operational experience in the Baltic Sea region. The same applies to Sweden’s position in the world and its Russia-centric strategic perspective. The interviewee explains:

*I was maybe a little bit arrogant in thinking that as a European, I understand what's driving Sweden, I think, even as a European, but certainly some of my American colleagues I think had no real understanding of Sweden's position in the world apart from their application to join NATO. So, I think it's maybe doing a bit of research into the country, [...] what are their high level national strategic aims. Why is the military there? [...] and understand what makes their military tick.*
Having been a NATO member for so long, the UK takes the alliance framework and benefits for granted. Collective threat perceptions that underpin NATO’s continued existence were considered the main situational variable for cognitive interoperability. The shared military connections and like-mindedness of the democratic Western world were also emphasized, with specific mention of the shared expeditionary mindset of the U.S. and the UK compared to more inward-looking European countries like Sweden. Related to Sweden’s inward focus on national territorial defense and its tradition of military non-alignment, the interviewee emphasized the need for Swedish officers to overcome their lack of experience within the alliance and to have a strategic opinion beyond Sweden, to think ‘that bigger NATO thought rather than just a Swedish thought’. The interviewee states:

“I think the thing for me that I began to understand is that a lot of officers in the Swedish military maybe haven't had that much experience outside of Sweden or the Swedish military. And so, their focus when thinking about NATO was very much about Sweden's part in NATO. And for instance, as part of the combined exercise, we were supposed to simulate the Supreme Allied Commander Europe, but the Swedish students kept talking about Sweden, not necessarily about taking that step back and trying to be NATO.”

From a UK perspective, U.S. officers should make up for their lack of knowledge by studying Swedish military strategic doctrine. Meanwhile Swedish officers must expand their regional mental frame, and actively participate in exercises and training to make up for their lack of experience as a NATO member. Swedish theorists should fill the gap in literature about small state strategy; and the Swedish military should proactively drive the development of its own theories, military strategic design, and doctrine. The interviewee concludes:

“Just because Sweden is a small country, it doesn't mean that Sweden hasn't got something to contribute. And by small, I mean on the strategic stage rather than in geographic terms. And as a military, it doesn't mean the Swedish armed forces haven't got something to contribute.”

The South Korean perspective

The South Korean interviewee explored aspects of U.S. military culture, cultural differences between Swedish and U.S. officers, and U.S. extensive multinational experience. Due to his own extensive experience, the interviewee was familiar with U.S. military culture, the sense of pride and patriotism, and core values. He describes U.S. military officers as ‘professional’, ‘willing to help’, and ‘striving to be the best professionals’ they can be. His admiration for the U.S. military as one of the most respected
institutions in the U.S. that enjoys the trust and confidence of the American people was shared by his Swedish colleagues, many of whom had never visited the U.S. The interviewee asserts:

“I understand that the U.S. military is one of the most respected departments in the U.S. but the Swedish military officers who had not experienced that before, they told me that, oh, this is the way the U.S. military soldiers are treated. Military officers in Swedish society, they are not respected as much as in the U.S. where their military officers are respected. During this trip I contemplated the way that military officers are treated and how militaries are one of the most important aspects in the administration and the Department of Defense. But in Sweden, maybe in the future, the Swedish Ministry of Defense will become more like this.”

One of the main cultural differences between the U.S. and Swedish officers as perceived by the South Korean participant was how much easier it was to talk to and get closer to the U.S. students based on their open mindedness and positive attitude. Moreover, U.S. students facilitated shared understanding and closeness by adapting their language to non-native speakers due to extensive experience in working with international partners from Asia. U.S. officers without such foreign area experience generally spoke faster and used a lot of unknown terminology and abbreviations. The interviewee observed similarities between his own and Swedish officers’ language insecurities:

“And I realize that it is not only me, but also my Swedish fellow students are afraid when they speak in front of native English speakers and they don't understand U.S. military strategy, doctrine, outlook, strategy process, and decision-making. They have the same limitation. From my perspective, I realized I am not the only one who has a language barrier, who doesn't understand one hundred percent U.S. military doctrine and outlook. And U.S. military officers want us other students to speak up and try to understand what we think [...] which is very unique from the South Korean military perspective and the Swedish perspective as well.”

The Swedish officers’ language insecurities appeared to be compounded by cultural differences like Swedish introversion, and a general reluctance to speak up observed in roughly half of the Swedish officers. A possible explanation for the Swedish officers’ lack of confidence in this context may have its roots in the politically driven isolation from the international alliance framework and the narrow focus on homeland defense expressed in Cold War armed neutrality and post-Cold War non-alignment. The near total disappearance of the military in the 1990s and early 2000s culminated in the 2013 declaration of the armed forces as a ‘special interest’. The Swedish military’s collective identity is arguably still in recovery from hitting rock bottom in terms of perceived relevance. The consequences of marginalizing the armed forces in the educational and public discourse may also have inhibited the development
of a stronger bond between the Swedish people and the modern military and a wholesome collective identity in Swedish military officers.

“I think U.S. military officers have many experiences in meeting other countries, but Swedish officer do not, they may have met only Norwegian officers or Finnish officers, but I don’t think many of them have experienced to conduct a combined exercise with U.S. forces. [...] And Sweden has no experience with war since the late 19th century. They started changing their mindset after the Crimea annexation and after Russian invaded Ukraine. But the Swedish military officers still think that it's not part of their world, but for the U.S. it's a totally different opinion, different point of view. So, they try to make this real for the Swedes.”

In sum, the South Korean perspective resembles the UK perspective in several key areas. In the absence of extensive experience in collaborating with U.S. officers, Swedish officers must embrace being more open and accepting of new approaches, not just from a doctrinal or technical interoperability perspective, but in a practical, pragmatic sense, to implement new ‘ways’ with new ‘means’ premised on new ‘ends’. Meanwhile, U.S. officers must understand Sweden’s unique military culture and challenging societal context, which is highly dissimilar from continental Europe and the other Scandinavian nations.

The Taiwanese perspective

The Taiwanese contributions centered around differences between Swedish and U.S. officers, the language barrier as a limiting factor, the importance of context within the military dimension, and how to be a good partner and ally.

The Taiwanese participant explained that because Taiwan does not have a military relationship with Sweden, his knowledge about Swedish military strategic outlook and doctrine was limited to Sweden’s singular focus on Russia and the war in Ukraine. Regarding Taiwan, he perceived the Swedish officers as ‘very thoughtful’ and ‘very different’ from the U.S. and their thinking about military strategy as ‘more diverse’. However, he acknowledged that “for Swedish students, how to develop the strategic concept was very difficult.” In addition, the main limiting factor was the language barrier, and military terminology. He states:

“I think language is very important. Like when I talk with the Sweden students, I feel comfortable. I think that they didn't use the very difficult English words in discussion. But the U.S. military officers most of the time use a lot of acronyms when they discuss military strategy. So, to me, it's very confusing, not only do I need to understand what that acronym means, I also need to memorize that word. Usually,
even after hearing the acronym over 10 times, I still don’t know what it means. Even though my fellow students already told me, for example ‘JIIM’, meaning joint, interagency, intergovernmental, and multinational environment. [...] It’s very confusing to me every time. For the Swedes during the excise, last week when I talked with my classmates, that’s the same thing.”

Language is key to human interaction. The interviewee emphasized that the English language (like any language) contains cultural assumptions that can hinder cooperation, and that one must be aware of one’s own and one’s partners’ language ideologies. Moreover, in a largely monolingual society like the U.S., the concepts of language and knowledge are frequently equated, and one tends to mistakenly link English language proficiency with competence and credibility. He explains:

“Sometimes the language is really a barrier. Like me, I like history, I like geography. And I read a lot, but because of the languages, sometimes people think that because I don’t know what you say, because I didn’t catch the meaning of that word, it means that I don't know. So, when you say something and I do not have a response for it, you just think that I didn't know. When actually, I not only knew it, I knew even more than that. But I just didn’t know how to respond.”

Regarding the military dimension, the Taiwanese interviewee emphasized ambiguity in a world that cannot always be neatly separated ‘into black and white’, and that in reality ‘there is a lot of gray and often there are no easy answers”. From a military perspective, he described the U.S. military as well-versed using the “M” in “DIME”. However, he believes that using ‘military power’ should be a last resort as it signifies that a situation has turned from gray to black and white. While in the ‘gray zone’, understanding the specific context is critical for strategy development, and is best accomplished through perspective taking. Moreover, because of the complex challenges, diplomatic efforts must be combined with military efforts in navigating the gray zone.

The interviewee believes that some of the friction between the U.S. and its allies stems from the lack of mutually supportive, collective intentionality. He explains:

“In the international order, I think most of the countries change because they think the U.S. supported them, because it served their national interest, it’s good. It makes sense. Everyone, every country does things in their national interest. But if you say you think about your own national interest only, without my national interest, then it will make me feel that I need to slow down with supporting you.”

When it comes to cognitive interoperability, respect and open-mindedness are most important. When senior leaders make decisions on international matters, consideration must be given to the other nation
involved. Words and actions are a powerful message to all other nations and must therefore be guided by attitude, understanding, and consideration. The interviewee elaborates:

"I think open mind is a very important. The U.S. military, most of time is the most advanced in the world. So, most of time they think that they know more about the military than other countries. But every country has their own methodology, their own “thinking knowledge” their culture, and their military. So, respect is very important. [...] Every country has their own honor, their own thing. Every country doesn't matter how big or small. [...] You must remember it. The open mind."

As far as the interplay of cross-cultural knowledge, skills, and attitudes as building blocks for cognitive interoperability, the interviewee discussed integration of all three competencies due to their interconnectedness, demonstrating systems thinking and holism, which is characteristic of Chinese culture and consistent with cultural dimension theory. Reminiscent of Confucian and Mengzian notions of different types of knowledge such as knowledge by explanation, knowledge by experience, and knowledge by thinking, he highlights:

“It's very difficult to answer this question, because to me, I think the three areas, knowledge, skills, and attitude, all of them are very important. And I think each of them is a factor to each other. I mean, especially knowledge and attitude, I think knowledge is very important, but knowledge also affects your attitude. The more knowledge you have, the more you respect or disrespect the other culture based on your opinion and knowledge [...] That's why I know Americans. Most questions, all the time they have a very clear answer to that question. They just think, oh, just this way. But, when I answer the question [...] I think a lot. We say we always think about everything, Chinese students, about our “thinking knowledge”, our way of thinking.”

To develop shared understanding and collective intent, the interviewee recommends for Swedish officers to be prepared and intimately familiar with Sweden’s national defense strategy and military strategic objectives, to study with U.S. officers, or to attend PME in the U.S. In doing so, Swedish officers can develop Swedish military strategy and methodology and apply their knowledge to their nation’s benefit.

5.3 Research Question Responses

Research Question 1

In response to research question 1, Swedish students considered the lack of cultural knowledge in U.S. officers responsible for cognitive and cultural biases as the main roadblock for cognitive interoperability. Major deficiencies in knowledge pertained to Sweden’s geostrategic exposure, historical experience
of armed conflict, national identity, military culture, and values. Another common pitfall was the lack of awareness of Sweden’s national interests and small state limitations such as resource constraints and threat proximity which limits the ability to transfer military strategic doctrine without contextual adaptation. Swedish participants were also aware that their own cognitive limitations, biases, and knowledge gaps are factors that hinder cognitive interoperability.

U.S. students observed a lack of experience and global perspective in Swedish officers likely stemming from military non-alignment, non-NATO status and the near total dissolution of the Swedish armed forces in the early 2000s. Moreover, a lack of confidence and sense of urgency stemming from cultural differences such as the concept of ‘lågöm’ were perceived as the most common pitfalls. This notion was corroborated by the UK participant, who experienced a higher degree of cognitive interoperability with the U.S. team members than the fellow European Swedish participants. Both the U.S. participants and the UK participant acknowledged self-awareness of their own biases, misconceptions, and knowledge gaps, however, despite a heightened awareness they continued to fall victim to cognitive fallacies.

The South Korean participant perceived language barriers as the most significant hindrance for cognitive interoperability. Additionally, differences in Eastern and Western culture such as concepts of power dynamics and hierarchy in the U.S. military versus Confucian values were mentioned as factors, as was Swedish introversion and isolationist tendencies. This sentiment was mirrored by the Taiwanese participant, who pointed out additional cultural and cognitive dimensions such as the U.S. lack of perspective taking and empathy for partner national interests, geopolitical concerns, threat perceptions, and national identity, but also Swedish lack of familiarity with developing strategic concepts, as well as his own lack of knowledge regarding Swedish geography, strategic outlook, and military context.

In sum, roadblocks for cognitive interoperability consist of (1) cultural barriers, (2) communication barriers and (3) knowledge gaps. Cultural barriers signify cultural differences stemming from cultural dimensions, stereotypes, biases, prejudice, and misconceptions. Communication barriers are predominantly language barriers and language ideology, misunderstandings, and miscommunication, which can lead to uncertainty, ambiguity, and confusion. These roadblocks were exacerbated by a lack of subject matter or vocational knowledge, a lack of preparation, self-efficacy and motivation, and a lack of military operational experience. The above cognitive barriers are informed by underlying negative attitudes and emotions. The barriers in turn reinforce existing negative affective states or trigger new ones at times. The most common clusters of negative attitudes and emotions are (1) disappointment, surprise, and shock; (2) anxiety, worry, and fear; (3) doubt, skepticism, and uncertainty.
Research Question 2

In response to research question 2 about gateways for cognitive interoperability, Swedish students emphasized their positive surprise over the level of professionalism and skill in U.S. officers. This led to a removal of pre-existing stereotypes and biases regarding U.S. officers. Deep diving into U.S. doctrine also enabled perspective taking and a more holistic understanding of U.S. global responsibilities. Moreover, U.S. cultural openness, easy going demeanor, and inclusivity were perceived as prominent facilitators.

The U.S. students perceived shared values such as the rule-based world order, freedom, and democracy as gateways for cognitive interoperability. Moreover, Swedish attributes like creativity and innovation were highlighted as major contributors, along with the Swedish professionalism, attention to detail, and pride in the profession of arms. The U.S. participants experienced their own self-improvement in areas like listening skills, patience, and perspective taking as conducive to cognitive interoperability.

The South Korean perspective named shared operational experience with U.S. officers as a decisive factor. Previous views of armed conflict such as fighting together on the Korean Peninsula during the Korean War and U.S. perspective taking and awareness of South Korea’s strategic exposure were major catalysts for common outlook and collective intentionality. The participant also experienced his new knowledge about U.S. doctrine and improved understanding of the strategy process as helpful. The Taiwanese student pointed out diversity in thinking as major building blocks, as well as consideration for partner nations, respect for other perspectives, compassion, and open-mindedness.

In sum, gateways for cognitive interoperability consist of cognitive and behavioral competencies. Cognitive competencies include (1) critical thinking such as self-reflection, self-awareness, and perspective-taking; (2) creative thinking such as a growth mindset, adaptability/flexibility, and curiosity; (3) systems thinking which is global, integrative, and holistic and acknowledges the interconnectedness and interdependencies of a globalized world; and (4) strategic thinking that acknowledges the existence of different lenses, uncovers blind spots, and develops new ways of looking at things to increase the likelihood of correctly identifying those things that matter most.

Behavioral competencies include (1) interpersonal skills like communication and interaction; social and socializing skills; and rapport and relationship building; (2) cooperative skills like team building, teamwork, and consensus building; (3) learning skills like professional development; self-improvement and personal growth; language proficiency; and continuous learning/lifelong learning; (4) cross-cultural skills comprised of culture specific knowledge, skills, and attitudes.
The above cognitive gateways are informed by underlying positive attitudes and emotions. The competencies accentuate existing positive affective states or spark new ones at times. The most common clusters of positive attitudes and emotions are (1) open mindedness, empathy, and stereotype reduction; (2) patience, respect, and trust; and (3) positivity, motivation, and confidence.

**Research Question 3**

In response to research question 3 regarding a framework for cognitive interoperability, in addition to barriers and gateways, the proposed framework includes three additional, external dimensions, (1) military context, (2) international context, and (3) universal context. Regarding the military context, the main categories that emerged from the strategic appraisal case study are the national security framework (process), military strategy & planning (methods), doctrine, military culture, and operational experience. Regarding the international context, the main categories that emerged include alliances & cooperation; national & collective identity; geostrategic exposure; historical experience of armed conflict, and policy. Regarding the universal human context, main themes include shared human desires identified in Maslow’s hierarchy of needs, and bonding over sports, food, family, or hobbies.

*Figure 19: Cognitive Interoperability Framework*
6. Discussion

This chapter contains the interpretation of the findings, links them to implications for literature, theory, and practice, and relates them to methodology and empirics. The remainder of the chapter contains recommendations for further research and conclusions.

6.1 Interpretation

The following is a summary that synthesizes the barriers, gateways, and additional dimensions described in chapter four into several findings and connects them to the existing research, literature, and theories.

First, cognitive interoperability is a complex, context-dependent, value dependent, and interdisciplinary subject developed through culturally informed communication and interaction, which enables perspective taking, empathy, and common ground. Combining individual realities or frames into a bigger picture that integrates both similar and divergent thinking enables the pursuit of common goals even though courses of action may differ. Culturally informed perspective taking and strategic empathy bridge cultural differences, prevent stereotyping, overcome language barriers, and resolve value conflicts. They foster common views, shared interests, end states, and desired outcomes, which can overwrite conflicting motives, and culminate in critical cognitive skills like predicting, forecasting, and anticipating friendly and adversary behaviors. A higher propensity to cooperate can even lead to collective intentionality with the potential to offset resource limitations, to mitigate the risk of strategic overstretch, and to compensate for blind spots and knowledge gaps. In offering more potential solutions to ‘what if’ scenarios, it becomes a management tool for strategic uncertainty that facilitates cognitive superiority to ‘out-think’ and ‘out-partner’ our adversaries.

Second, identity plays a decisive role in the cognitive interoperability. Military identity and values can transcend national identity so that the common ground found in military culture provides enough similarities to serve as a shared point of departure. However, national or group identity permeates and can present major hurdles to cooperation. Given the synchronicity or meaningful coincidence of diverse strategic, social, and language cultures in NATO, one may initially need to resort to finding commonality in universal military experiences and core values like selfless duty, service to nation, and the special bond between military practitioners. Common ground can also be found in universal human themes like family or hobbies. At its core, cognitive interoperability development is based on our shared humanity, with the human element as the baseline driver and access vector in situations where cultural differences are more pronounced and long before cognitive fallacies complicate the process.
Human connectivity is a critical enabler for success in the competition continuum. Socializing and networking promote interpersonal connectivity, which complements technological network connectivity and information integration. Human connectivity also embraces Sun Tzu’s aspiration and traditional element of Chinese strategic thinking, the idea of ‘winning without fighting’ (不战而屈人之兵)\(^\text{106}\). Expanding the idea of connectivity to the human dimension and bringing partners and allies together creates an advantageous position in that it demonstrates shared intentionality and the ability to ‘win with fighting’ if needed. Cognitive interoperability as a purely human function is based on different inputs that merge into a common output or perception. This perception signifies understanding and also believing in what we are doing together. This shared mental frame constitutes the essence of our combined fighting power in the cognitive domain.

The last theme centers around the realization that cognitive interoperability is **collectively constructed** and driven by the will to cooperate. Cognitive interoperability develops through a creative, generative, and participatory process that requires time, effort, and energy. It starts on the individual level with communicating, which facilitates higher level activities such as strategic planning, campaigning, and partnering. Each individual participant has agency in this process, which means one can actively shape it by reading, researching, and bettering oneself to improve one’s own cognitive interoperability potential. This increased potential propels the collective activity of learning about each other and the construction of shared goals. This also implies that we must be willing to be wrong, to fail, to revise our incorrect assumptions and stereotypical notions, and to start over again with lessons learnt. We can then come together as partners with a clear purpose and contrive collective intentionality, a ‘we’ mentality of altruistic cooperation. We can thereby replace superficial understanding and wavetop collaboration with genuine discourse and effective integration.

### 6.2 Implications for theory and practice

**Practice**

First, the study results can inform training and education such as foreign and joint PME. Both Swedish and U.S. students pointed out the importance of knowing each other’s military strategic doctrine and national defense strategy. Swedish interviewee 3 remarked that JACSP is insufficient, and that a separate PME is needed for senior field grade officers with command experience. Moreover, he explains that JACSP does not track above average performance, nor provide structured feedback to the Swedish

---

armed forces. He recommends enhancing the status of JACSP and offering more real-world learning opportunities with partners and allies. Further, interviewee 6 considers the lack of integration between the Swedish Ministry of Defense and SDU a major shortcoming, compared to the U.S. PME system where JAWS is nested with joint PME and integrated with the DoD. Moreover, JACSP students prefer English language instruction to cover NATO and DoD terminology and to be more fully integrated with the course syllabus. Other recommendations include more exposure to strategic planning methodologies prior to the combined planning exercise to free cognitive space for the exercise task and to offer electives in social science, psychology, and philosophy to complement the military capstone courses.

Second, the study results indicate that alliance membership can be of tremendous value for the development of cognitive interoperability. Swedish students became more aware of the benefits and requirements of NATO membership, and conflicting national interests and agendas of member states. Swedish officers echoed the realization that it will require an uncommon level of assertiveness, a stern will to claim one’s space, and a high degree of strategic thinking that may feel counterintuitive to Swedish or Nordic identity (Swedish interviewee 4). Interviewee 5 added that it will not be possible to insist on doing things the ‘Swedish way’ in a multinational environment. Interviewee 7 added that cognitive interoperability is tied to the flexibility of doing things in different ways, which is crucial in a world that is not fixed, but flexible and fluid. Interviewee 8 reflected that it is ‘not natural to understand how Sweden thinks’, however non-Swedes must still try, and that cognitive interoperability means accepting the distinctness and diversity of fellow alliance members.

Swedish officers also mentioned the differences in national, political, and economical perspectives in NATO on China, and described Turkey as a strength and weakness in terms of alliance dynamics. This is a prime example of the social heuristics hypothesis of cooperation theory at the institutional level, in that NATO as the most trustworthy institution in the world incentivizes good behavior and cooperation. While Swedish students perceive that Turkey is using NATO for its own benefits versus alliance benefits, they acknowledge that from an alliance theory point of view, it is better to have Turkey in NATO than fighting for Russia, and as a possible mediator with nations like Iran (Swedish interviewee 6). NATO is considered an opportune environment to overcome seemingly insurmountable ideological or values-based differences (interviewee 10, 11). Interviewee 9 further emphasized that a healthy dose of realism and critical thinking will be essential moving forward as naiveness or a bias for too much open-mindedness or optimism will be counter-productive to claiming one’s place in NATO. Whether a case of true collective intentionality or a coincidental alignment of interests, alliances serve as political statements and strategic messaging.
Third, this study illustrates how a combined strategic appraisal exercise fulfils the line of effort ‘with partners & allies’ outlined in the NDS 2022. Sweden and the U.S. are also strengthening their bilateral ties per the Swedish Defense Proposition 2020 through of U.S.-Sweden Defense Cooperation Agreement. In the educational field, a memorandum of understanding between Marine Corps University’s Krulak Center and SDU is under development in fulfilment of higher’s intent and consistent with the U.S. Marine Corps’ aspirations for Force Design 2030. The reflections from both Swedish and U.S. students are abundantly clear, highlighting the synergies and efficiencies achieved through bilateral relations, resource pooling, and integration of capabilities suggested in the formal policy guidelines.

Cognitive interoperability thus differs at each level of war, with defense and security policy and the political systems at its center on the military-strategic level (Swedish interviewee 10). This is where cognitive interoperability connects with international cooperation theory, which suggests that cooperation is driven by desired foreign policy outcomes and end states such as deterrence. Keeping in mind that cooperation requires strategic decisions to make a state more secure, Sweden must weigh idealism against practicality and critically reflect on the feasibility of past strategic choices. Neutrality is morally no better than taking a stance contrary to what Sweden’s moral great power aspirations may suggest. Swedish interviewee 11 explains:

“But if you have never been put in the real situation, then it’s easy to promote more idealistic values than what is practically feasible. And the Swedes would be the ones expressing more idealistic values than what would be realistic if they were put in a real situation.”

Theory

First, cultural dimension theory provides an initial, albeit simplistic understanding of cultural differences that might become barriers for cognitive interoperability. The author was aware of the common criticism that six cultural dimensions are insufficient to determine cultural differences and that Hofstede’s model is not generalizable. Similarly, the author anticipated the theory’s main criticism, which is its static and reductionist view of culture, especially given today’s context of globalization, convergence, and multi-domain operations. Therefore, in addition to the cultural dimensions, intercultural theory and the cross-cultural competence model were chosen to observe the culture specific KSA that facilitate perspective taking and empathy across different cultures. This model proved to be a useful discovery tool for cultural barriers and facilitative factors for cognitive interoperability. However, while intercultural theory offers explanations for cultural roadblocks and enablers, it does not account for barriers stemming from military or national culture and identity. It was therefore insufficient to explain one recurring theme, the lack of confidence in Swedish participants which co-occurred with a sense of uncertainty of national
and military identity, a lack of clarity about Sweden’s place in the international order, and a lack of consensus regarding the purpose for NATO membership.

Second, in anticipating that cultural theory would likely offer only partial explanations, the author chose cooperation theory and the social heuristics hypothesis to validate assumptions about ‘irrational’ cooperation at the organizational level, keeping in mind that organizations like NATO incentivize the convergence of divergent national interests into one ‘collective intentionality’. Numerous data points corroborated the theory’s proposition that cooperation arises tacitly and slowly, as allied expectations and objectives converge over time. Cooperation theory thereby provided a crucial access vector for the conceptualization of cognitive interoperability.

An additional theory to conceptualize cognitive interoperability could be military culture theory which describes military culture as an expression of collective identity. Defined by Mansoor and Murray as “habitual practices, default programs, hidden assumptions and unreflected cognitive frames that underpin how an organization functions”, military culture shapes military identity and predicts behaviors. Although the interviews contained numerous data points related to military culture and identity, due to the interdisciplinary nature of the research subject, it is unlikely that any singular theory will lead to a holistic cognitive interoperability framework.

Third, the study delivers on the proposed research contribution in several ways. It directly responds to Rosson’s call for ‘germane empirical research’ about how a multinational staff planning exercise can develop cognitive interoperability. What makes the study distinct is that it investigates cognitive interoperability at the military strategic level amongst senior students enrolled in joint PME as opposed the operational level amongst mid-grade students. In doing so, the study links strategic thinking competencies, the nascent field of emotions and biases in strategic planning, aspects of human behavior in military contexts, and national identity as a cultural dimension of strategy and policy to the concept of cognitive interoperability. Moreover, the participants are not limited to one branch of service but represent all branches of service from both the U.S. and Sweden. Furthermore, the participants are culturally less similar than those in Rosson’s study (U.S. and UK) and include two non-WEIRD participants from South Korea and Taiwan to solicit diverse and multi-paradigmatic feedback. Additionally, the cognitive interoperability framework takes an international perspective compared to Oliver who conceptualizes it at the joint (national) level for the New Zealand Defense Force. Lastly, the study puts intercultural

---

competence into a military strategic context thereby adding another layer to existing cross-cultural competence research.

6.3 Methodological and empirical implications

Limitations

There are several shortcomings in this study based on practical and theoretical constraints. First, the generalizability of some of the study’s perspectives can be questioned due to the small sample size representing the Eastern, non-WEIRD paradigm. Likewise, the singular deviant case regarding the perceived benefit of the combined exercise and negative learning outcomes can be considered statistically irrelevant. However, as a qualitative case study and initial probe, the study initiates a wholly absent and much needed dialogue with culturally distal partners like Taiwan, with whom the U.S. anticipates partnering very closely in the future. Moreover, the participants from the UK, South Korea, and Taiwan can serve as a type of control group that offers novel perspectives that inspire further research. Likewise, any deviation from the norm warrants a closer look and the formulation of new questions. The Taiwanese participant elaborates:

"They would like to know about the Taiwan perspective. And I say I would like to cover that perspective, even I cannot represent Taiwan, but I would like to put things on the table, I can give you my perspective. When you look at your strategy, you mentioned that you have this Taiwan perspective. It is really sad because as I know, the U.S. has the big exercise in the Pacific about Pacific strategy in Hawaii in June (*RIMPAC). But there is no Taiwanese person included, so I feel concerned about it."

Second, the representativeness of some of the study results can be questioned, and the study should be repeated to reflect the demographics of the U.S. and Swedish armed forces more accurately. Third, this study is a singular, cross-sectional study that investigates a collectively constructed phenomenon that develops slowly and over time. Although the participants were senior military officers with a wealth of international experience and an advanced cross-cultural competency, a longitudinal study could assess changes in the same sample over time and would capture the evolutionary aspects of the phenomenon. Fourth, the short exercise duration meant that the author only had three days of observation and participants only had three days of interaction to develop knowledge and mutual understanding. A longer exercise would result in a more nuanced understanding of how and to what degree cognitive interoperability can be developed over time. Fifth, the combined exercise took place in the U.S. shortly after arrival when the Swedish students were still adjusting to a different time zone and climate. Sixth, the U.S. students had to split their focus between the combined exercise and competing academic
requirements. This situation created distractions and limited the Swedish and U.S. participants ability to focus exclusively on the exercise objectives.

**Delimitations**

There are several delimitations in this study which reflect the choices made by the author regarding the focus and scope of the research aim and research questions. First, the study is limited to members from the author’s own small working group and other select members from across the other eleven small working groups. A more deliberate approach could have entailed at least one Swedish and one U.S. student from the same small working groups to compare similarities and differences in how they perceived their collaboration. This could have been of particular interest in the group with the deviant case, the explicit skepticism towards the combined exercise value and the somewhat pessimistic estimate of future collaboration with Sweden.

Second, this study does not include faculty observations nor faculty interviews. Because learning and teaching are interconnected and interact in multiple ways to effect change and improve cognitive competencies, engaging with the staff on the concept of cognitive interoperability would have added another analytical perspective to the study. Coincidentally, many of the attributes of a good teacher were identified in the study as facilitative factors for cognitive interoperability, to include communication and listening skills, adaptability, empathy, and patience. Moreover, factors like an engaging and positive disposition, real-world and life-long learning, and exchange and perspective taking are universally applicable to teaching and learning.

Third, the combined strategic appraisal exercise was mainly selected to accommodate the researcher in hopes that it would yield enough data and observation to meaningfully discuss the research topic. A different data collection opportunity will likely lead to new findings and interpretations.

**6.4 Recommendation for further research**

First, as stated by Rosson, the research topic of cognitive interoperability is nascent and in need of ‘refinement, repetition, and creativity to gain popularity and usefulness’. Further research should incorporate distal cultures, and the different levels of war. Next, different environments such as academic and theoretical, but also training and operational environments during real-world exercises present new data collection opportunities to further develop the concept. Including faculty in academic settings will add another layer to a cognitive interoperability model. The applicability of the findings for junior

---

108 Rosson, 2022, p. 127
officer or enlisted PME or the tactical should also be explored further. Finally, a longitudinal study that follows up with the same people in several years can reveal temporal changes.

While the degree of cognitive interoperability may not be of concern initially, once the concept is better understood, quantitative research could provide insight into variables that lead to a greater degree of cognitive interoperability, something that PME institutions could capitalize on for education and training purposes. Lastly, each of the themes discovered in this study by inductive means warrants further investigation. Some of the themes capture broad concepts in established research fields. The author was floored by the unexpected diversity of ideas and associations that emerged during the data collection and the creative depth and breadth of the responses. Each one of these ideas and associations should be carefully researched with a narrower focus and more depth. This includes the role of emotional intelligence, which is complementary to cultural intelligence (CQ)\textsuperscript{109} and cross-cultural competence (3C), and its impact on strategic thinking and decision-making.

Lastly, because the research topic inherently resides in the human mind or cognitive domain, any technology that has the potential to impact human cognition should be considered for future research. Artificial Intelligence (AI) systems that attempt to simulate human thought and behavior or that augment human thinking and problem-solving skills must be integrated with the study of human cognition and cognitive interoperability.

6.5 Conclusions

The purpose of this case study using a strategic appraisal exercise was to identify roadblocks and gateways for cognitive interoperability at the military strategic level and to investigate how the experiences of the participants can inform a framework for cognitive interoperability. The case study was the SDU – JAWS combined exercise, with data collected through observation, document analysis, and semi-structured interviews. The analysis resulted in a diverse set of themes related to barriers, facilitators, and additional dimensions to inform an initial framework. The findings indicated that culturally informed perspective taking, and strategic empathy are crucial to develop cognitive interoperability. Moreover, identities are the single-most influential frames that inhibit or promote cognitive interoperability development. Human connectivity is a major catalyst in the collective construction of this uniquely human phenomenon. Individuals are agents in this process and their capacity to act infers limitless possibilities in the generative power of cognitive interoperability for alliances and partnerships.

\textsuperscript{109} Earley, Christopher P. & Soon Ang. Cultural Intelligence: Individual Interactions Across Cultures (Stanford, CA, 2003)
REFERENCES

Books


Earley, Christopher P. & Soon Ang, *Cultural Intelligence: Individual Interactions Across Cultures* (Stanford, CA, 2003)


Mansoor, Peter R. and Williamson Murray (eds.), *The Culture of Military Organizations* (Cambridge, 2019)

Yin, Robert K., *Case Study Research: Design and Methods* (Los Angeles, 2009)

Scientific Articles


Yarger, Harry R., “The Strategic Appraisal, The Key to Effective Strategy”. *Strategic Studies Institute* (2008), [Link](#) [accessed 5/2/23]


**Reports**


**Military & Doctrinal Publications**

Chairman of the Joint Chiefs of Staff, “National Military Strategy” (Washington D.C., 2022) [Link](#) [accessed 5/19/23]
Försvarsmakten, “Militärstrategisk Doktrin 2022” (Stockholm, 2022), Link [accessed 2/15/23]


Försvarsdepartementet, “Avsiktsförklaring/Statement of Intent between the U.S. and Sweden” (Stockholm, 2016), Link [accessed 4/19/23]


NATO Allied Command Transformation, “NATO Warfighting Capstone Concept” (Norfolk, VA, 2021), Link [accessed 4/23/23]


U.S. Department of Defense, “Protection of Human Subjects and Adherence to Ethical Standards in DoD-Conducted and -Supported Research” (DoD Instruction 3216.02) (Washington, D.C., 2012), Link [accessed 2/15/23]


Newspaper & Journal Articles


APPENDICES

Appendix A: Interview Consent Form

Interview / Questionnaire:

Joint Advanced Warfighting School (JAWS, Norfolk) Three-day Strategic Planning Scenario Exercise with Swedish Defense University (SDU, Stockholm)

- This interview / questionnaire is UNCLASSIFIED//FOUO
- Please spell out or define acronyms / abbreviations.
- Please quantify numbers and percentages associated with observations.
- When finished with your Questionnaire please send to Silvia.Haas@student.fhs.se

This interview / questionnaire will address the topics presented during the Swedish / U.S. student participant brief given at JAWS on 28 Feb 2023. The purpose of this interview / questionnaire is to collect information to serve as empirical data in support of my master’s thesis in fulfilment of the graduation requirements for the Joint Command and Staff Program (JACSP) at Swedish Defense University (SDU). The information from this interview / questionnaire may be made available to other NATO countries and allies.

This interview / questionnaire will be conducted at the UNCLASSIFIED//FOUO level. ____

Do I have permission to submit your responses and associate your name with them? (Yes / No): ____

Your candidness during the interview is much appreciated!

Have a nice day!
Appendix B: Research Topic Info Sheet

TOPIC FACT SHEET

“With Allies and Partners: PME, Cross-Cultural Competence and Cognitive Interoperability”

Cognitive interoperability (also: interoperability of the mind)

“A complex and multidimensional concept that is relevant at the strategic, operational, and tactical levels” (Paget, 2016, p. 42).

“Confidence and mutual understanding based on shared military education and values” (Blad & Potts, 2002, p. 140).

“The degree to which multinational military officers can think alike and anticipate one another’s actions while operating together to achieve a common goal (Hura et al., 2000; JCS, 2019b; NATO, 2019; Paget, 2016 in: Rosson, 2022).

Cross-cultural competence (3C)

- A set of knowledge, affect, and skill components that develop in response to experience, training, and education

1. Regional expertise
2. Language
3. Cross-cultural competence
   a. knowledge (cultural awareness, language)
   b. skills (interpersonal skills, flexibility)
   c. attitudes (empathy)

- Antecedent variables:
  - Dispositional (big 5)
  - Biographical (prior experience, gender, age)
  - Self & identity (cultural identity)

- Situational variables (i.e. strategic congruence)

- Organizational variables (i.e. organizational culture)

- Outside of this model
  - Leadership
  - Reflexivity

- Barriers to 3C
  - Ethnocentrism
  - Stereotyping
  - Psychological
  - Language barriers
  - Geographical distance
  - Conflicting values
Appendix C: Semi-Structured Interview Questions

1. Question 1:
   Please introduce yourself:
   a. Branch of service
   b. Military occupational specialty
   c. Gender
   d. Age
   e. Rank
   f. Years of service
   g. Most recent key billet (commander, XO, OPSO)
   h. Anything else you would like people to know about you.

2. Question 2:
   What bilateral training and education experience with the U.S. do you have other than the JAWS-SDU combined exercise?

3. Question 3:
   a. What was your experience with U.S. military culture prior to this exercise?
   b. How did you prepare yourself for meeting the U.S. military officer students?
   c. What are lessons learnt after working with the U.S. military officer students?

4. Question 4:
   a. What was your knowledge about the U.S. armed forces prior to the exercise?
   b. What was your knowledge about U.S. military-strategic doctrine and outlook?
   c. What was your knowledge about relevant U.S. capabilities?

5. Question 5:
   a. How did this exercise impact your previous knowledge and experiences with U.S. military officers?
   b. Discuss something new you learnt about the U.S. armed forces!

6. Question 6:
   a. What during the JAWS-SDU combined exercise did you find most challenging regarding the U.S. students?
   b. What during the JAWS-SDU combined exercise did you find most rewarding regarding the U.S. students?

7. Question 7
   a. How did the JAWS-SDU combined exercise develop your cross-cultural competence?
      Please identify areas of improvement.
   b. What other activities supported your cross-cultural development?
8. Question 8
   a. How confident are you in cross-cultural competence to succeed in a multinational work environment? Why?
   b. Did your confidence level change after the JAWS-SDU combined exercise? If yes, how?

9. Question 9
   a. Which of the three pillars of cross-cultural competence (knowledge, skills, attitudes) do you consider most important? Please explain your choice.

10. Question 10:
    How did the JAWS-SDU combined exercise enhance your cognitive interoperability, meaning "the degree to which multinational military officers can think alike and anticipate one another's actions while operating together to achieve a common goal?"

11. Question 11:
    What else do you believe determines cognitive interoperability? Consider antecedent variables such as character traits, biographical factors, situational variables (threat perceptions), organizational variables, leadership traits, or barriers such as language, value conflicts, geographical differences (page 1)?

12. Question 12:
    What other activities (other than training and education) can develop cognitive interoperability?

13. Question 13:
    a. What advice would you give Swedish personnel to prepare for future collaboration with U.S. officers, whether part of NATO or as a bilateral partnership?
    b. What advice would you give U.S. officers to prepare for future collaboration with Swedish officers, whether part of NATO or as a bilateral partnership?

14. Question 14:
    What else would you like to add regarding the JAWS-SDU combined exercise or other bilateral training and education opportunities with the U.S. armed forces?

15. Comments / Questions / Concerns
Appendix D: Artificial Intelligence Coding Worksheet