Collaborative Crisis Response

The influence of occupational backgrounds and phase transitions on the decision-making of police and military commanders in hybrid warfare

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Thesis for the degree of Philosophiae Doctor (PhD)
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List of Publications

Paper 1

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Paper 2

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Paper 3

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Abstract

Purpose: This thesis explores the decision-making processes of Norwegian police and military commanders in the context of hybrid warfare. It aims to examine the predictive value of Albert Bandura's Social Cognitive Theory (SCT) in understanding decision-making in ambiguous situations, specifically in police-military collaborations.

Design/Methodology/Approach: The thesis employs a quasi-experimental design, incorporating high-fidelity headquarters simulations to investigate the decision-making of both individuals and dyads. The data analysis is presented across three thematically interconnected papers. Paper 1 investigates the influence of domain-specific expertise and the crisis phase on decision preferences among commanders using multinomial logistic regression. Paper 2 examines how bidirectional transitions from peace to war influence commanders' preferences for offensive actions and performance using ANOVA tests. Paper 3 explores how social cognitive factors predict wartime performance at the dyad level through path analysis.

Findings: Paper 1 describes significant variations in decision preferences between police and military commanders based on crisis phase and operational experience. While all commanders displayed a general inclination towards favoring forces from their own sector, their preference for interagency forces increased in wartime situations. Paper 2 shows how escalating crisis conditions result in more offensive postures, heightened urgency, and improved performance among commanders, with police commanders exhibiting the highest urgency levels. Paper 3 further describes the influence of domain-specific expertise on decision-making, emphasizing the significant role of persistence in understanding wartime performance.

Originality/Value: The findings emphasize the impact of domain-specific expertise, changing threat conditions, and sector differences on decision-making. The thesis offers valuable insights for policymakers and practitioners in the development of decision-making frameworks and training programs tailored to police and military commanders, enabling them to effectively tackle emerging security threats. Furthermore, it addresses crucial knowledge gaps in our comprehension of collaborative crisis response.

Contents

Introduction

To ensure collaborative efforts, prudent management of resources and the optimal use of expertise to prevent, detect and counter security threats, investigations should be made of the ways in which national security providers are coordinated and interact when it comes to facing an uncertain future level of threat (Gjørv et al., 2012, p. 449)

This statement recaps the observations of the Gjørv Commission, which assert that more effective governmental measures could have been implemented in the handling of the July 22 terror attacks in Norway. The commission highlights deficiencies in decision-making within the Norwegian crisis management system, resource mobilization, information sharing, and overall national preparedness. Gjørv et al. (2012) conclude that stakeholders at all levels of government must systematically enhance their understanding of emerging threats and bolster their capabilities for fostering cross-sectoral collaborations. In this thesis, "cross-sectoral" refers to activities that entail multiple sectors working together, emphasizing the exchange of information, resources, and expertise across sectors (Vangen et al., 2015). "Collaboration" refers to the process of facilitating efficient collective efforts aimed at managing challenges that individual sectors may struggle to resolve independently. (Agranoff & McGuire, 2003). Moreover, the term "sector" refers to the distinct domains of the police and military.

In this context, the Gjørv Commission asserts that improving police-military interoperability is of utmost importance for achieving a successful collaborative crisis response. Subsequently, significant strides have been taken to bolster the government's capability to coordinate comprehensive approaches to new and evolving security threats (Storberget et al., 2023). An illustrative instance lies in the revision of the "assistance instructions" with the objective of optimizing the interface between the police and military, thereby enhancing their capacity to facilitate effective cross-sectoral coordination (Royal Decree 789, June 16, 2017). However, limited research has been conducted to explore how the domain-specific expertise possessed by various national security providers could influence collaborative endeavors (Storberget et al., 2023, p. 323). This gap becomes even more

apparent in security crises induced by hybrid warfare (Corbe & Cusumano, 2018), where events entail heightened political tensions and irreversible consequences once decisions are made (Mumford, 2020). As used herein, the term "crises" encompasses events that pose substantial risks to the fundamental structures and core values underpinning public safety (Dyson & t'Hart, 2013). Moreover, the term "security crisis" denotes a series of hostile actions that give rise to significant uncertainty and a strong likelihood of all-out war, compelling prompt responses from government officials to effectively address threats to national security (Levy, 2023).

Against this backdrop, the present thesis aims to address existing gaps in knowledge by examining how police and military commanders engage in decision-making. Through multivariate analyses we explore the relationships among repeated measurements of multiple social cognitive factors. Decision-making refers to the process by which individuals, working collaboratively without conflicting interests, but facing ambiguous situations, leverage their domain-specific expertise to assess events, form expectations, identify relevant cues and goals, and select appropriate responses (Klein, 2017). Within this framework, Bandura (1997) highlights the role of individual experiences and cognitive processes in describing the foundations for how individuals think and act. He further emphasizes how individuals engage in self-reflection to assess their effectiveness in dealing with the given situations, leading them to adjust their approaches accordingly (p. 5). In our studies, we believe that by considering these social cognitive factors, professionals, organizations, and policymakers can better understand decision-making differences and develop strategies to enhance the decision-making frameworks of cross-sectoral collaborations.

Background

For as long as collective endeavors have been directed towards crisis response, it is reasonable to posit that there are inherent challenges within such undertakings. Nohrstedt et al. (2018) conducted research that identifies these challenges and categorizes them into four distinct areas exerting a significant influence on decision makers in times of crises. These categories include: (1) Coping with ambiguities; (2) Mobilizing efforts that match the scale of events; (3) Coordinating resources across sectoral boundaries; and (4) Getting relevant others to accept their definition of the situation. These components highlight the critical role played by the dynamic interplay between situational demands and individuals' crisis management skills in their ability to make decisions, particularly in the context of security crises typically

involving high risks (Williams, 2021). Hence, there is widespread consensus among scholars that the involvement of multiple actors intensifies the inherent challenges associated with crisis management (Marchau et al., 2019). Yet our current understanding of the response measures that yield benefits in security crises remains at a preliminary stage, and it is evident that there is a lack of empirical analyses concerning the decision-making of individuals in these settings (Schmid, 2021).

For example, in the crisis response systems of Western countries[i], the interactions of the police and military are carefully regulated to ensure a clear delineation of roles and jurisdictions (Førde et al., 2019). Nevertheless, their operational environment is increasingly characterized by threats that traverse the functional boundaries between these two entities (Diesen, 2018). These threats not only complicate the practical difficulties inherent in collaborative crisis response, but also present intricate decision-making dilemmas that surpass those solely associated with security concerns within a single sector (McFarland, 2021). As a result, established security concepts employed by the police and military are being challenged in the face of transboundary challenges (Seigel, 2019). These threats, often referred to as hybrid warfare, exhibit ambiguous and multifaceted manifestations that obscure the origins and intentions of the involved parties. Consequently, attributing responsibility to specific actors becomes challenging, further hindering the ability of individuals in positions of authority to effectively address these threats (Weissmann, Nilsson, & Palmertz, 2021). For the purposes of this thesis, hybrid warfare is defined as "The purposeful and tailored violent application of advanced conventional military capabilities with irregular tactics, with terrorism and criminal activities, or combination of regular and irregular forces, operating as part of a common design in the same battlespace" (Hoffman, 2018, p. 40)

While the police-military interface is frequently tested in real-life operations and training exercises, there are few data-driven examinations regarding the decision-making of commanding officers in security crises (Shortland et al., 2019, p. 47). Scholarly attention has primarily been directed towards the actions of ground troops, with limited consideration given to the performance of decision makers situated in national headquarters (Jervis, 2017b, p. xvi). Consequently, the decision-making processes of those responsible for coordinating collaborative crisis response, encompassing the simultaneous and swift management of multiple interagency operations, have received limited attention from empirical researchers.

On this note, scholars argue that new knowledge about the functioning of individuals in positions of authority should be just as important as understanding the operations of social

institutions and governments (Huddy et al., 2023). Similarly, scholarly discussions assert the significance of considering the psychological aspects that shape decision preferences, alongside explaining the mechanisms that drive these processes and their manifestations in the dynamic interplay between individuals and the situations they confront (Caprara & Vecchione, 2013).

Scope and research questions

Given that the police and military sectors represent distinct domains that intersect during crises (Wither, 2020), the framework of Bandura's (2023) Social Cognitive Theory (SCT) was utilized, as it offers valuable perspectives on decision-making at both the individual and group levels, with a particular emphasis on triadic reciprocality (Stajkovic & Sergent, 2019). The SCT framework builds upon individuals' proactive monitoring and analysis of actions; reflecting on consequences, and highlighting the salience of pre-existing beliefs during critical moments. These cognitive assessments guide adaptive behavior by directing individuals towards decisions that aim to achieve desired outcomes while avoiding unfavorable ones (Schunk, 2012). Consequently, we believe that SCT facilitates assessment of the individual cognitions and social influences that impact decision-making within the context of collaborative crisis response.

Our purpose was to examine the factors that influence how individuals holding positions of authority in the police and military make decisions, and how those decisions are carried out. We wanted to understand what shapes the preferences of these individuals when they face difficult decisions, and how their preferences change over time in a dynamic and ambiguous threat environment. Our main objective was to investigate whether police and military commanders respond differently to threats, based on their specific roles and responsibilities within their respective domains of expertise. SCT suggests that the ways professionals react to situations at work is affected by both their job-related abilities and the contexts in which those situations arise. When things are unclear or not well-defined, these influences should become more noticeable (Bandura, 1999, p. 174). Thus, in the current thesis, we anticipated that SCT would provide an explanatory structure for understanding the commanders' propensity to prioritize certain operational aspects over others, as well as their ability to make effective decisions.

In contemporary literature on decision-making, there is a prevalent emphasis on social cognitive factors as a crucial aspect of understanding human functioning in real-world settings (Haines & Moore, 2003), particularly within the realm of collaborative endeavors (Hastie & Kameda, 2005). According to SCT, the presence of unclear and overlapping work-related responsibilities may result in police and military commanders relying more on their domain-specific expertise, perceiving it as beneficial for collaborative efforts. Moreover, when events are characterized by deficiencies and disputes, both parties may be less motivated to invest the necessary effort in resolving tasks and maintaining commitment in challenging situations. In the context of hybrid warfare, which is marked by such ambiguity, we argue that this selective activation of personal influences would be likely to vary significantly, due to the reciprocal interactions that take place during such events. Hence, we contend that the effectiveness of crisis response should be contingent upon the specific context and the police and military commanders' ability to adapt their approach in intentional ways.

To this end, we measured the influence of having police or military backgrounds on the decision preferences of commanding officers. Furthermore, we examined the decision-making effects of transitioning from a period of peace to a state of war, and subsequently into a post-conflict condition. To predict performance in police-military interactions, the following factors were considered: Firstly, the previous achievements of individuals in positions of authority were considered, as these can offer valuable insights into their capabilities and expertise (Mosier et al., 2018). Secondly, the composition of the groups to which they belonged was examined, as this can influence their decision-making processes and overall performance (Earley & Gibson, 2002). Thirdly, the level of persistence exhibited by these individuals, or their ability to remain determined and focused despite challenges, was taken into consideration, as this can have an impact on their effectiveness (Schunk & Usher, 2019). Finally, we measured individuals' beliefs regarding their own efficacy and collective capabilities, since these factors may play a significant role in determining performance (Bandura, 1997).

Moreover, these factors make clear our main research questions, namely:

- To what extent do the contrasting backgrounds of police and military commanders influence decision-making in hybrid warfare contexts? (RQ1)
- To what degree do changing threats that traverse sectoral boundaries impact the decision preferences of police and military commanders? (RQ2)

- How can the performance of commanding officers situated in national headquarters be predicted in times of war? (RQ3)

This line of inquiry follows the logical progression described by Hayes and Rockwood (2020) in their work on understanding conditional relationships and underlying mechanisms. According to their framework, when an effect is observed, such as divergent decision preferences among professionals, it will prompt inquiries into the conditions or circumstances that give rise to this effect. Consequently, the investigation of "when" the differences occur necessitates a thorough examination of diverse factors, encompassing time, context, specific variables, and triggers that may exert influence on the manifestation of the effect. By identifying the conditions that precede or accompany the effect, researchers can gain insights into the specific mechanisms that are associated with the observed performance outcomes.

The rationale behind how the ideas of Hayes and Rockwood (2020) influenced our research questions and the overarching study design is visually demonstrated in Figure 1. The figure depicts the logical connections between our papers and the underlying assumptions that guided our analyses. It underscores the significance of comprehending the decision-making processes through which an effect operates, in order to gain insights into its contingencies or boundary conditions in the context of security crises, particularly hybrid attacks. Furthermore, the diagram points to some possible implications of our research that may provide valuable insights for individuals engaged in cross-sector collaborations, including policy modifications, improvements in response strategies, and the potential for broader organizational consequences across various fields and industries. In short, Figure 1 helps to organize and identify our research flow and reasoning.

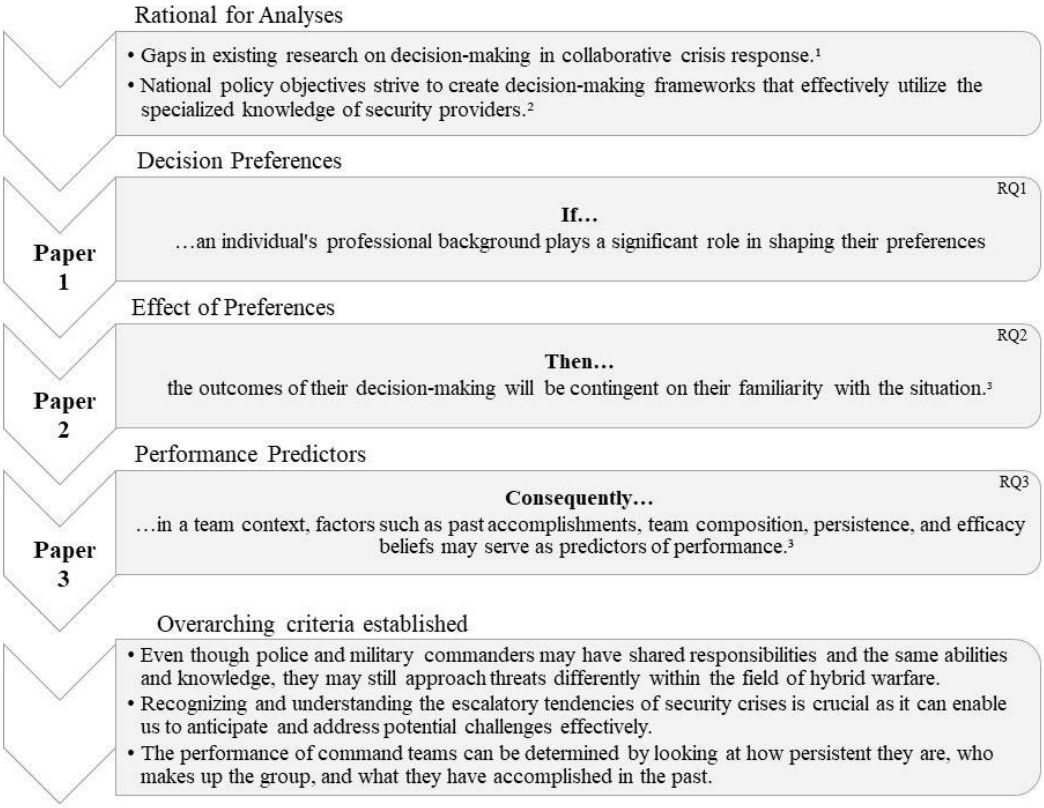

Figure 1: Logic map,[1] Bynander and Nohrstedt (2019),[2] Gjørv et al. (2012),[3] (Bandura, 1986)

Social cognitive foundations for decision-making

SCT conceptualizes how ambiguous events gain informational value through self-referential thoughts triggered by past experiences in related task domains (Bandura, 1999, p. 181). For instance, when individuals are unsure about the connection between immediate actions and long-term outcomes, they may interpret their prior experiences anticipatorily. These interpretations can then manifest in different ways. On occasion, they may translate into effective actions that propel progress. In other instances, however, they can result in individuals reducing their efforts or abandoning their pursuits in the face of challenges. In times of crisis, the ability of decision-makers to adapt and regulate themselves could thus be of utmost importance.

It is evident how this self-reflective capacity enables the effective management of change and uncertainty, thereby playing a vital role in several aspects of collaborative crisis

response. This includes the optimization of resource allocation, consideration of long-term implications, engagement of stakeholders, and upholding or changing one's approaches. as necessary. Therefore, having an adaptive self-regulatory capacity significantly enhances the chances of making well-informed and effective decisions that contribute to a successful response to the challenges at hand (p. 175).

SCT encompasses several associated theories that explain how individuals make decisions when faced with ambiguity. These theories include concepts such as heuristics, biases, and framing effects (Kahneman & Tversky, 2013), as well as recognition-primed decision-making, as proposed by Klein (2017). While these models share similarities with SCT in terms of the importance of mentally simulating outcomes, they primarily serve a descriptive purpose. In contrast, SCT goes beyond mere description and offers an understanding of how structural and process-level factors interact to shape thoughts and actions according to social reality (Bandura, 1999). In other words, through regulatory mechanisms, domain-specific experiences contribute to the development of self-structures, which, in turn, guide behavior through contextually relevant self-processes (p. 162).

Drawing on the aforementioned arguments, it is our belief that SCT offers a comprehensive explanation for how the choices of police and military commanders are influenced by their beliefs regarding the outcomes of their actions and their consideration of necessary behavioral adjustments in collaborative settings. SCT is particularly valuable in shedding light on why individuals regulate their behavior to rationalize innovative solutions in contexts they perceive as relevant, while failing to do so in other situations (Zimmerman, 2000, p. 14).

Triadic reciprocality

A central tenet of SCT is the concept of triadic reciprocality (Schunk, 2012). This principle elucidates that human functioning is contingent upon the reciprocal interactions among three factors: (a) Behavior, (b) Cognitive and other personal factors, and (c) Environmental events. In essence, triadic reciprocality suggests that the relative influences exerted by each factor differ according to circumstances, individuals, activities, and group composition. This concept highlights the bidirectional nature of human behavior, emphasizing that individuals are active agents in shaping their own experiences and outcomes within the context of their social environment (Bandura, 1986).

Bandura further elaborates on how triadic reciprocality is based on an ontologically irreducible individual existing self and a plurality of emergent agentic processes that enable people to be intentional doers, even amidst ambiguity. Subsequently, Bandura (2006b) formulates the manner in which these triadic interactions generate a sense of agency, enabling the exercise of control through self-referential thoughts concerning the appropriateness of actions amidst the presence of numerous and often conflicting preferences. This agentic process encompasses introspection that influences individuals' perception of themselves, their capabilities, and their subsequent behavior (p. 168).

From a practical standpoint, triadic reciprocality suggests that competent commanders who possess a strong belief in their own abilities, and in their organization's capacity to effectively handle collaborative endeavors, are more likely to engage in actions that facilitate progress. These behavioral and personal factors may encompass being receptive to feedback obtained from operational assessments and demonstrating the appropriate level of effort in the face of difficulties. For researchers aiming to enhance governmental crisis response systems, the central focus should thus be to comprehend the causal framework of triadic reciprocality and how it predicts the performance of individuals in positions of authority. In the current thesis, we firmly assert that acquiring such insights holds substantial potential for enhancing decision-making outcomes in security crises, particularly in the demanding context of highly ambiguous conditions like hybrid warfare.

When implementing triadic reciprocality within organizational settings, Wood and Bandura (1989) describe the pivotal role that individuals' standards of adequacy, derived from both organizational properties and personal belief systems, play in shaping behavior. For instance, the standards individuals hold have a significant impact on their behavioral patterns (person → behavior). Empirical research has demonstrated how standards influence the selection of activities, the level of effort invested, the duration of commitment, and the strategies employed (Lent et al., 2016). Conversely, individuals' behaviors also shape their standards (behavior → person). As individuals engage in tasks and evaluate their progress, they make necessary adjustments or uphold existing standards (Bandura, 1999).

Similarly, the interrelation between personal and environmental factors (person → environment) can be elucidated through an examination of military officers who diligently uphold elevated standards in adhering to the laws of armed conflict, thereby contributing to the preservation of a semblance of humanity in the operational environment (Solis, 2021). When police officers collaborate with the military, their reactions may be influenced by their

perceptions of the military (e.g. having trouble with restraining the use of force during certain situations), rather than accurate assessments of the military personnel's actual capabilities. Consequently, the feedback received from the environment can impact the standards held by commanding officers (environment → person). For instance, when the police share their knowledge and understanding with the military, this tends to facilitate improved collaboration and the achievement of shared objectives (Auglend, 2016). This interplay between personal factors and the environment should thus be observable in police-military collaborations.

Likewise, the environment can exert influence on behavior (environment → behavior). Clear communication of the resources required to accomplish tasks by the commanding officer will guide the efforts of subordinate commanders if effectively conveyed (Bartone et al., 2010). In turn, the behavior of subordinates has the potential to modify the operational environment (behavior → environment). Accordingly, if superior commanders set specific conditions that must be met for mission success, and subordinates fail to fulfill these conditions, superior commanders might be more inclined to revise the mission, rather than continue with the overarching operation. According to Bandura (1999), understanding this interactive relationship between behavior and the social environment necessitates exploring how individuals' decision-making processes are influenced as they engage in actions and experience the subsequent effects.

Self-regulation and standards of adequacy

Social Cognitive Theory (SCT) assigns a central role to the process through which the exercise of agency is translated into actions through self-regulatory mechanisms (Schunk, 2012). These mechanisms involve proactive and reactive adaptations, judgments of capabilities and environmental opportunities, and subfunctions such as self-monitoring, self-evaluation, and self-sanctioning that are rooted in cognitive frameworks comprising personal and organizational standards of adequacy (Zimmerman, 2000, p. 14). Organizational standards encompass aspects such as rules, laws, or organizational norms that instigate individuals' inclination to adhere to them. Personal standards include goals, values, or ideals that serve as guiding principles (MacKenzie & Baumeister, 2015, p. 96). Within the framework of triadic reciprocality, these are environmental and personal factors, respectively (Bandura, 1986).

The belief systems formed by these cognitive dynamics serve as a basis for actions, directing individuals towards outcomes that give them a sense of self-worth and play a

significant role in human functioning by encompassing six self-regulatory elements: (a) Proactive adoption of standards that stem from a value system and serve advantageous purposes; (b) Self-appraisal of personal efficacy in meeting the established standards; (c) Anticipatory regulation of strategies and effort required to actualize the standards; (d) Outcome expectations associated with the fulfillment or non-fulfillment of standards; (e) Affective self-evaluative responses to one's performances, and (f) Metacognitive activity concerning the accuracy of one's efficacy appraisals, the suitability of one's standards, and the adequacy of one's effort (Bandura, 1996, p. 20).

As described by (Zimmerman, 2000), these components occur across three distinct phases: forethought, performance or volitional control, and self-reflection. Forethought encompasses the cognitive processes that establish the foundation for subsequent actions. Performance or volitional control involves the processes that occur during the execution of intentional actions. Self-reflection, on the other hand, entails the cognitive processes that shape an individual's response to the outcomes of their action (p. 16). Zimmerman also explains how, within this cyclical process, standards serve as a means for individuals to distinguish between success and failure, and that they will remain enduring unless modified following the observations of their inadequacy (p. 20).

Thus, on the one hand, it seems increasingly evident that faulty standards can result in faulty self-regulation in situations that necessitate meticulous attention. Conversely, if the standards are well-suited, they should enable improvisation in ambiguous circumstances by offering initial estimations when precise answers are unattainable. As described by triadic reciprocality, the evaluative use of standards in the exercise of self-regulation is not only a product of pure cognition, but just as much an expression of how contextual influences and emotions are activated according to established beliefs derived from previous experience (Bandura, 1999, p. 190).

In the context of the present thesis, this suggests how the dynamics of self-regulation can provide explanations for potential divergences in preferred courses of action among police and military commanders, even when confronted with identical situations. Furthermore, SCT offers valuable insights into why self-reflective verifications of the fit between their standards and the outcomes they produce could result in decision-making adjustments in the face of difficulties. This propensity for adjustments would become particularly probable if the commanders perceived ongoing circumstances as providing valid grounds to explore alternative or unconventional approaches. Figure 2 illustrates the influences of standards on self-regulation.

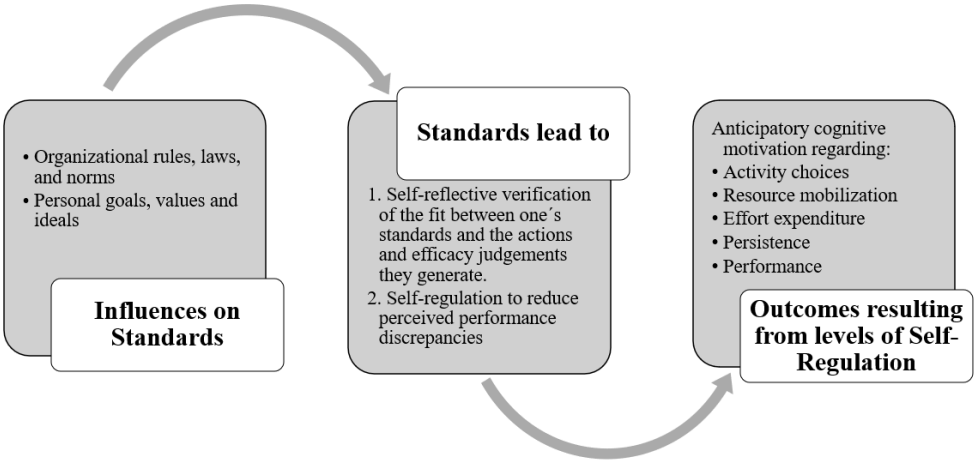

Figure 2: Influences of standards on self-regulatory outcomes. The illustration was created by the authors as a visual description of the self-processes examined in the current thesis.

Ambiguity

In circumstances characterized by ambiguity, such as the collaborative crisis response to hybrid attacks, Bandura (1999) provides further insight into how contrasting standards and feedback ambiguity make it increasingly difficult to evaluate progress accurately and self-regulate efficiently. In such cases, Bandura explains how individuals are inclined to rely on proven procedures, rather than adapting them to unfamiliar situations that surpass their prior experiences. Moreover, he describes how developing the self-regulatory capacity to adapt despite uncertainty is no simple task in ambiguous settings where actions operate in multifaceted causal structures and often yield mixed effects (p. 174). These arguments are supported by crisis management research that discusses how conditions of risk and urgency tend to strengthen people's commitment to established methods, instead of implementing lessons learned from recent activities that would have resulted in more efficient actions if they had been taken into account (Tokakis et al., 2019). As used herein, ambiguity refers to features of decision-making in which events, preferences, and intentions are hazily defined, and have multiple meanings or opposing interpretations (March, 1994, p. 179).

Within the domain of organizational management, Schunk and DiBenedetto (2016) provide further explanation of the motivational aspects of standards and self-regulation in ambiguous settings. They explain how performance attainments rely not only on discrepancy reduction through reactive control, but also on discrepancy production through proactive control. For instance, in situations where performances are perceived as falling short of an

established standard, determined individuals will engage in reactive self-regulation to mobilize efforts and address any discrepancies while upholding their standards. Conversely, in proactive self-regulation, these individuals adjust their standards to inspire the adoption of innovative approaches and to mobilize the efforts needed to reduce discrepancies. In other words, standards are shaped simultaneously, as they determine which information is extracted and how it is translated into motivated actions through forethought and self-reflective reasoning (Bandura, 1999, p. 176).

Impact of ambiguity on decision-making

In the ambiguous context of the present thesis, it seems reasonable to posit that the substance and direction of the police and military commanders' decision-making will depend to a great extent on whether a course of action aligns with their standards of adequacy or deviates from them. For instance, in situations where commanders encounter ambiguity that prompts them to question the applicability of their established standards, they may initially opt to employ a tried-and-tested approach. Nevertheless, if they begin to doubt the pertinence of a specific standard in light of the prevailing ambiguity, they may choose to discontinue their reliance on methods associated with that particular standard. In such cases, Bandura (p. 162) describes how individuals may vary in their adoption of elements from alternative sources, resulting in unique approaches that match the perceived limitations and possibilities of the current situation. This suggests that differential preferences may arise when individuals with diverse backgrounds collaborate. It is indeed expected that such differences may be further amplified in ambiguous and high stakes contexts in which there are no ideal options (Marchau et al., 2019, p. 28).

For example, since desired outcomes exert their influence through forethought, which involves the evaluation of alternative courses of action and the consideration of potential consequences, allowing individuals to prepare for future events by setting goals and generating strategies (Bandura, 1999). Individuals who believe that exerting more effort will lead to desired outcomes may then be inclined to pursue unconventional courses of action that align with a newly embraced standard, even if it may not be the most dependable one. Similarly, those who wish to reduce their efforts may persist by focusing on the potential achievements they could attain through strict adherence to established standards, until the issues are resolved or the link between actions and outcomes becomes evident through repeated experience (Bandura, 1999, p. 158). These assertions also find support in group-level studies that elucidate how ambiguity gives rise to variations in the relationship between self-

processes and group effectiveness (Gibson, 1999). However, it is important to understand that while SCT has shown broad applicability, its implications are not all-encompassing. Certain situations may present unique challenges that can influence the effectiveness of individuals' self-regulatory capacities (Schunk & Usher, 2019).

On this note, it is widely recognized within the collaborative crisis response field that despite the clear distinction between the roles and responsibilities of the police and military, respectively (Heieraas, 2010), the enforcement of sector-specific standards frequently generates notable frustration among those involved (Larssen, 2021). In such contexts, where there are few shared standards of adequacy, SCT explains how decision-makers will strive to interpret the relevance of each other's approaches and how they align with overarching aims and strategic directions (Bandura, 1999). At this stage, the favorability of a particular course of action will depend on the standards against which it is evaluated (p. 175). Scholars indeed discuss the degree to which the police and military assess the relevance of their standards (Borch et al., 2020) and consequently adjust their operational conduct based on beliefs supported by each other's successful actions (Bonacker, 2019).

Self-efficacy

Social Cognitive Theory (SCT) provides an explanation for how self-regulation and performance are influenced by judgments of self-efficacy (Bandura, 1997). It refers to individuals' perceived capability to perform actions at designated levels in ways that give them some control over events that influence their lives. Individuals acquire information to assess their self-efficacy from four sources: (a) Enactive mastery experiences; (b) Vicarious experiences from observing the performance of others; (c) Verbal persuasion by significant others; and (d) Affective and physiological states during the situations in which actions are demonstrated (p. 79). Moreover, efficacy beliefs vary in level, strength, and generality across different domains of functioning. Level pertains to the perceived difficulty faced by individuals in adopting a particular behavior. Strength reflects the degree of certainty an individual possesses regarding their ability to successfully perform a specific task. Generality denotes the extent to which efficacy beliefs are positively related, either within a specific domain, across different domains, or over time (van der Bijl & Shortridge-Baggett, 2000, p. 16).

Bandura (1999) further explains that the indicators individuals use to assess their self-efficacy can vary, based on task difficulties, the heuristics employed to integrate efficacy

information, and selective biases in monitoring events. These efficacy evaluations not only influence the courses of action individuals consider, but also regulate their actual implementation (p. 181). Consequently, individuals with high levels of self-efficacy tend to engage in activities, invest greater effort, persist more resolutely, and perform better compared to those with lower levels of self-efficacy (Schunk & DiBenedetto, 2021, p. 156). Accordingly, it becomes apparent how these mechanisms could influence leadership behaviors and thus serve as crucial factors in predicting decision-making outcomes in collaborative crisis response. For an illustration of the conditional relationship between self-efficacy and the outcomes that flow from a given course of action, see Figure 3.

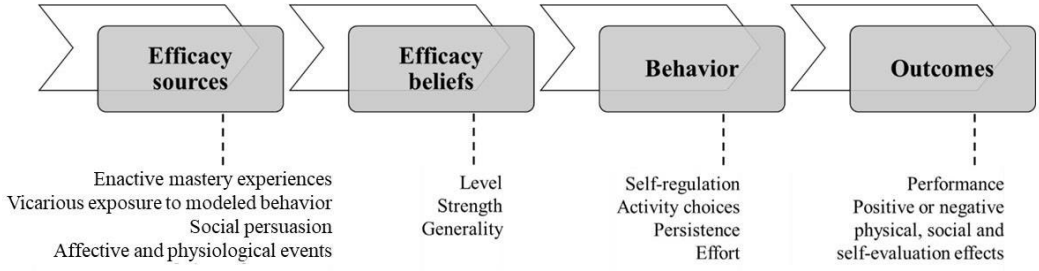

Figure 3: The relationship between self-efficacy and the outcomes resulting from a given action. The illustration was created by the authors as a visual description of the self-efficacy construct utilized in the current thesis.

Within the domains of military and police work, scholarly research has uncovered connections between self-efficacy and positive outcomes in various areas. These areas include selection courses (Johnsen et al., 2013; Nordmo et al., 2022), simulator training (Johnsen et al., 2017), coping with acute stress (Delahaij et al., 2011), leadership effectiveness (Ramchunder & Martins, 2014), job satisfaction (Judge & Bono, 2001) and organizational commitment (Booth-Kewley et al., 2017). Many of these studies have prompted adjustments to the influence of efficacy beliefs within teams (Krammer et al., 2018), as well as efficacy's susceptibility to ambiguity and change (Usher & Pajares, 2008) and cultural variables (Schunk & Usher, 2019). Hence, Schunk and DiBenedetto (2021) propose a shift in focus towards context, persistence, and collective beliefs to enhance our understanding of Bandura´s self-efficacy construct.

Collective self-efficacy

The collective self-efficacy beliefs of people working together are not simply the sum of the self-efficacy of individual group members, but rather reflect individuals' beliefs regarding a group's ability to perform given tasks effectively (Schunk & Usher, 2019, p. 22). On this note, Maddux (1995) describes how efficacy beliefs promote persistence in the face of obstacles and why groups with high levels of collective efficacy thus tend to perform better than those with lower efficacy levels (p. 323). Although extensive research has examined the multifaceted effects of collective self-efficacy on group performance in diverse work-related contexts (Stajkovic et al., 2009) and situations characterized by ambiguity (Gibson, 1999), limited knowledge exists regarding the ways in which these processes influence behavior when multiple security providers collaborate in the management of security crises (Caliskan & Liégeois, 2021).

In this context, research describes the intricate relationship between organizational cohesion and its potential to either increase or reduce the impact of collective self-efficacy (Riasudeen et al., 2019). Furthermore, scholars assert that the influence of collective self-efficacy exhibits variability across diverse settings (Tschannen-Moran et al., 2015). Additionally, it has been observed that collective self-efficacy has greater predictive power in relation to group performance, when compared to the perceived self-efficacy of individual members (Lent et al., 2006). Lastly, when the objective is to evaluate group performance, it is imperative to measure efficacy beliefs at the task level (Earley & Gibson, 2002). Overall, research identifies several factors that require further investigation into how professionals' efficacy beliefs interact with domain-specific competencies, influencing decisions related to activity selection, effort allocation, persistence, and performance, particularly in dynamic and ambiguous settings.

According to Bandura (1997), in situations characterized by ambiguity, such as security crises, the collective self-efficacy beliefs of police and military commanders should play a crucial role in their ability to effectively manage the tasks at hand. For example, consider a scenario where a terrorist attack occurs in a densely populated area. If the commanders involved possess strong beliefs in their collective efficacy, they should have an enhanced capacity to anticipate the enemy's actions and allocate resources accordingly. This means they may be more prone to take proactive action. They should also exhibit greater inclination towards innovative thinking and adapt their strategies in response to change. On the other hand, commanders with low levels of collective self-efficacy may demonstrate a preference for postponing action. They may hesitate when it comes to deploying forces to

urgent missions and may rely heavily on explicit instructions from higher authorities. Furthermore, they may adhere to established protocols and overlook the need for creative solutions to effectively counteract threats. Thus, following Gist (1987), it seems plausible that these differences in decision-making between commanders with low and high beliefs about their collective abilities could entail substantial organizational implications that might influence the overall outcome of collaborative efforts.

The decision environment of hybrid warfare

The decision environment of hybrid warfare has emerged as a significant area of study in the field of security policy (Cusumano & Corbe, 2018). Researchers have observed that hybrid warfare presents unique challenges to the ability of individuals in positions of authority to respond effectively (Libiseller, 2023). While numerous descriptions exist regarding the decision-making environment of hybrid warfare, its most commonly noted characteristic is its inherent ambiguity. Mumford and Carlucci (2022) elaborate on this ambiguity, highlighting the ways it deliberately manipulates time and space in strategic matters. This involves multiple hostile actors with diverse intentions who leverage a wide range of military, police, and civilian resources. Schmid (2021) argues for how this blending of methods complicates the decision-making process of those affected by involving diverse stakeholders in assessing threats that traverse the functional boundaries of various government sectors. Imagine a country facing hybrid attacks that involve a combination of cyber intrusions, disinformation campaigns, and coordinated terrorist activities. These threats traverse the functional boundaries of multiple government sectors, requiring a collaborative response.

This holds particular relevance in the context of police-military interactions, where clear sector-specific responsibilities govern the management, support, and leadership of crisis response (Thiele, 2021). As outlined by Lægreid and Rykkja (2018), both the police and military are organized and trained to respond swiftly to emergencies. They have established command and control systems, communication networks, and operational procedures that can be activated in times of crisis. This readiness enables both entities to mobilize resources, deploy personnel, and coordinate response efforts in a timely and coordinated manner. While their interactions bring together diverse expertise, including intelligence agencies, government departments, private sector entities, and international partners, they also introduce complexities in coordinating and aligning their efforts to effectively address challenges that traverse the functional boundaries of multiple actors (Larsson, 2017). In this context, scholars

argue that decision-makers may encounter difficulties in adapting and responding adequately to change when operating within structures initially established during times of peace (Weissmann, Nilsson, & Palmertz, 2021). As a result, those in charge must possess the ability to take decisive action in the unfamiliar conditions of warfare, where there is limited or no prior experience to draw upon (Shortland et al., 2020).

For example, in a joint police-military effort aimed at countering a series of coordinated attacks by a non-state actor, the initial intelligence estimates indicating that the primary threat is terrorists targeting public spaces will play a major role in guiding the decision-making of commanding officers. Considering the constraints imposed by sectoral boundaries, limited resource availability, and the urgency of swift timelines, commanders might allocate priority to enhancing physical security at vulnerable locations, deploying assets to conduct search operations, and intensifying surveillance in densely populated areas to detect potential threats. However, as events unfold, subsequent intelligence updates indicate that the adversary has also resorted to cyber-attacks to undermine public trust and disrupt critical infrastructure. Simultaneously, reports emerge of armed groups with maritime capabilities launching attacks on selected offshore oil platforms and onshore refineries. These events give rise to potential risks, including the threat of human casualties, environmental hazards, compromised control systems, and significant disruption of the regional energy supply chain. Consequently, considering the potential challenges these threats may pose to the targeted state's crisis response system, it is highly likely that those in charge may adopt suboptimal approaches when addressing these multifaceted events. This is particularly evident in view of the inherent variations in the self-regulatory capacities of individuals, which could further impede their ability to efficiently engage in a collaborative crisis response.

Instances of such challenges are exemplified in real-life conflicts, such as the ongoing war in Ukraine involving private militias (Østensen & Bukkvoll, 2022) and separatist groups supported by Russia (Freedman, 2019). The multifaceted conflict in Syria is another illustrative example, combining both conventional and unconventional tactics (Bachmann & Jones, 2021). Furthermore, the Baltic States face security concerns regarding the attribution of attacks and the implementation of response measures (Bladaitė & Šešelgytė, 2020). There have also been instances of hybrid attacks and influence operations targeting electoral processes and political systems in various nations (Couretas, 2022). Collectively, these events exemplify a decision-making environment characterized by ambiguity, the involvement of multiple actors, the blending of diverse methods, transboundary implications, information

warfare, the necessity of interagency coordination, and the potential for escalation, requiring decision-makers to make timely and prompt decisions.

To address these issues, many countries have adopted whole-of-government approaches, seeking to bridge gaps among diverse security providers and facilitate cross-sector collaborations (Wrange, 2022). This involves close coordination and collaboration among different agencies and sectors, including the military, law enforcement, intelligence, diplomatic, and civilian entities (Lawson, 2021). Norway's concept of total defense, for instance, seeks to unify all sectors of society, encompassing both military defense and civil defense (Norheim-Martinsen et al., 2019). Similar examples can be seen in Estonia (Praks, 2015), Australia (Kelton et al., 2019), the North Atlantic Treaty Organization (NATO) (Maronkova, 2021), and the European Union (Wigell et al., 2021). These instances highlight the importance of comprehensive strategies involving collaboration between government agencies in enhancing a country's capacity to respond to hybrid warfare. Nonetheless, scholars argue for a broader and more comprehensive understanding of the decision-making frameworks that enable effective responses to the continuously evolving threats posed by hybrid warfare throughout the various phases of a crisis (Jackson, 2019).

The aim and design of the thesis

The primary aim of this thesis is to investigate the influence of occupational background (police/military) and phase transitions (peace/war/post-conflict) on the decision-making preferences and performance of commanding officers within the context of hybrid warfare. The term "phase transitions" refers to the shifts that can take place during hybrid warfare, encompassing the transition from a state of relative stability or normalcy to a state characterized by armed conflict. Furthermore, the concept of "occupational backgrounds" refers to the training, experience, and expertise possessed by police and military commanders. This encompasses their educational qualifications, prior positions held, and specific skills pertinent to their respective professions.

Given the intricate nature of human functioning in social environments, SCT emphasizes the importance of studying how individuals regulate their actions in anticipation of specific outcomes. Consequently, we aimed to investigate how the relevance of a particular course of action to individuals' standards, personal competencies, and perceived environmental opportunities influenced their decisions and performance within that activity

domain. To achieve this, the thesis analyzed personal, behavioral, and environmental factors as described by SCT, exploring how they intersected with the activity choices of police and military commanders, and assessing their contributions to various decision-making outcomes.

Given that work-related decisions influenced by self-referent thoughts entail cognitive evaluations comparing professional standards with perceived progress, thereby creating incentives for actions expected to yield desired outcomes and positive effects (Bandura, 1999), this thesis employed variables closely resembling the actual responsibilities of police and military commanders in collaborative crisis response. For instance, the participants engaged in decision-making aimed at effectively responding to hybrid attacks. This entailed assessing the severity of events, identifying relevant approaches, and determining the optimal allocation of resources to achieve progress, while mitigating the impact of the crisis. Consequently, our studies involved microanalyses of triadic reciprocal causation, in which commanders managed dynamic and ambiguous threats. See Figure 4 for an overview of the overall research design.

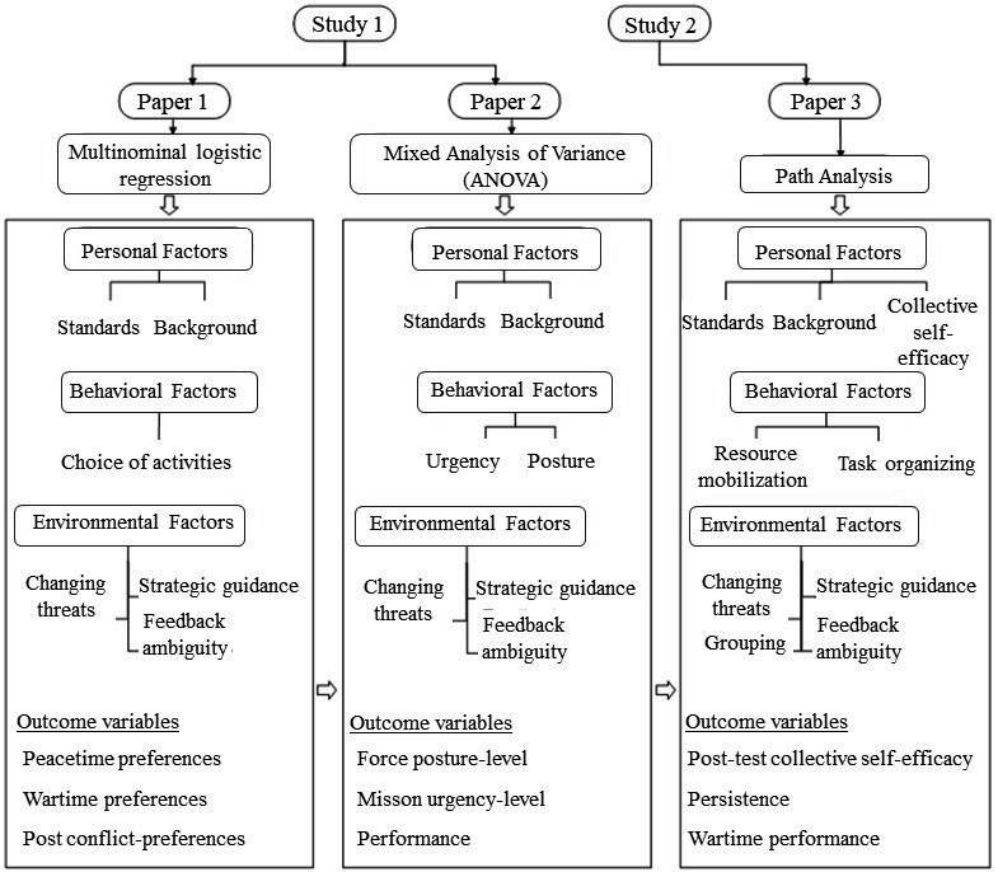

Figure 4: The overall research design of the present thesis. The articles are based on different, yet thematically interconnected, datasets.

Research aims of each paper

Paper 1

The objective of our first paper was to examine whether the occupational backgrounds of police and military commanders played a pivotal role in guiding actions regarding matters of perceived importance. One would anticipate that police commanders, when faced with ambiguity, would prefer familiar law enforcement methods over untested military approaches. Similarly, military commanders would also lean towards relying on established practices in challenging circumstances. However, such divergent perspectives, focusing on distinct aspects of the same task, could potentially hinder effective crisis response if novel cross-sectoral solutions are dismissed without careful consideration (Marchau et al., 2019).

One example of a task that might lead to differing preferences between police and military commanders in hybrid warfare is the management of public demonstrations or protests within a conflict zone. From a law enforcement perspective, police commanders may prioritize crowd control, maintaining public order, and protecting civilians. In contrast, the primary objective of military commanders may lie in identifying and neutralizing security threats swiftly, protecting critical infrastructure, and supporting overall military objectives. Consequently, a police commander may believe that the police force is better suited for a particular task, while a military commander may argue that the military should handle it. This can create challenges in coordinating and aligning the efforts of different security forces.

Thus, the objective of Paper 1 was to investigate the decision-making of police and military commanders engaged in hybrid warfare, specifically examining their choices regarding force composition[ii]. Given their divergent backgrounds, it was expected that they would have varying interpretations regarding the necessary capabilities, resulting in different decisions about the security forces responsible for conducting operations. Subsequently, the participants were divided into two groups: police and military. The groups were balanced in terms of crisis response experience and years of active duty in their respective sectors. The commanders' activity choices were measured using multiple answer options and analyzed using multinomial logistic regression methods. This approach aimed to explore the potential relationship between the commanders' occupational backgrounds and their decision preferences across three threat conditions: peace, war, and post-conflict. To address this, four hypotheses (H) were examined:

H1: Police commanders would demonstrate a predisposition toward choosing law enforcement units, and military commanders would be predisposed toward choosing military units.

H2: In the transition from peace to war both police and military commanders would demonstrate an increased preference for interagency forces.

H3: The retransition from war to the post-conflict phase would make the commanders of both sectors demonstrate a lower preference for interagency forces.

H4: Experienced commanders would show greater preferences for interagency forces than commanders with less operational experience.

Paper 2

The objective of our second paper was to expand upon the findings presented in Paper 1 by investigating the interaction effects between occupational background and changing threat conditions. It aimed to analyze whether the transition from a state of peace to war, and a subsequent return to a post-conflict condition, influenced the police and military commanders' inclination towards offensive and urgent actions, as well as any performance differences observed under each condition. Effectively navigating such dynamic environments requires decision makers to make flexible adjustments to their plans and approaches in order to effectively manage evolving events (Bonanno & Burton, 2013). Within the current thesis' hybrid warfare context, a noteworthy example of this concerns the influence of selective self-regulatory strategies employed by police and military commanders, and how they may manifest themselves differently as new threats arise, or existing threats modify their tactics. This could entail the reallocation of resources, modification of operational procedures, or adoption of innovative approaches.

Given that both the police and military are crucial for the collaborative crisis response and possess complementary capacities (Larssen, 2021), it was of interest to explore the extent to which these two entities displayed decision-making differences when confronted with hybrid warfare. The focus was not on whether the commanders' skills were equally developed to a high level, but rather on how their distinct domain-specific expertise was manifested in their actions when confronted with diverse situational demands. We assert that understanding how these mechanisms influence their decisions is vital for predicting crisis trajectories and to prepare for the potential contingencies that may arise. These insights could help us improve the strategies implemented by commanding officers in the face of difficulties. To address these aspects, six hypotheses were examined:

H1a: Transitioning from peace to war would increase posture and urgency in both the police and military group.

H1b: Both groups' posture and urgency decisions would return to peacetime levels in the post-conflict phase.

H2a: Police commanders would demonstrate more offensive and urgent decision-making in the peace and post-conflict phase when compared to military commanders.

H2b: Military commanders would demonstrate more offensive actions and greater urgencies in times of war when compared to police commanders.

H3a: Military commanders would achieve higher decision-making performance than police commanders in wartime.

H3b: Police commanders would achieve higher decision-making performance than military commanders in the peace and post-conflict phase.

Paper 3

The objective of our third paper was to extend and enhance the individual-level findings presented in Paper 1 and 2 by investigating the group-level dynamics, specifically focusing on the organizational performance of dyads comprising police and/or military commanders. Paper 3 aimed to investigate the degree to which variations in performance within these dyads could be explained by social cognitive factors such as collective self-efficacy, dyad composition, past performance, and persistence. While these variables have been shown to predict behavioral outcomes in various work-related domains (Tian et al., 2019), their impact on police-military collaborations or hybrid warfare contexts has not yet been explored. Building upon this gap, the third paper aimed to contribute new insights into the psychological mechanisms that influence organizational performance when the police and military jointly respond to hybrid attacks. Moreover, given the potential implications arising from identifying sectoral differences in the performance of police and military commanders, it could facilitate the development of joint operational plans. These plans, in turn, could establish clearer guidelines regarding communication, intelligence sharing, the use of force, and educational requirements. Consequently, to address our objective, three hypotheses were examined:

H1: Interagency grouping will enhance organizational performance both directly and indirectly by effecting persistence.

H2: High levels of peacetime performance will enhance organizational performance in wartime both directly and indirectly by effecting persistence.

H3: A strong sense of collective self-efficacy will enhance organizational performance both directly and indirectly by effecting persistence.

H4: Elevated levels of persistence will reduce the level of organizational performance in wartime.

Variables used in each paper

In Paper 1, the "Force composition" decision task was employed as the outcome variable, categorized into nominal values. This choice was motivated by the fact that commanders responsible for ground reaction forces have a primary duty to mobilize resources that possess the necessary capabilities to respond effectively to crises (NATO, 2019a). To examine the influence of crisis escalatory tendencies on the police and military commanders' force composition decision-making, this variable was measured at multiple time points across three distinct conditions: peacetime, wartime, and post-conflict. The temporal sequencing aimed to closely mimic the dynamic conditions encountered in real-world crises (NATO, 2013). Moreover, scholarly discussions highlight the advantages of interagency formations in crisis response (Thiele, 2021), while also acknowledging the challenges posed by sector-based thinking that often hampers police-military collaborations (Floyd, 2021). Analyzing the force composition decisions of those in charge thus appeared to be a natural starting point for empirical investigation, aiming to provide additional insights into these arguments.

In Paper 2, the "Force posture"[iii] and "Mission urgency"[iv] decision tasks were chosen as outcome variables, both of which in continuous form as foundations for deriving two additional subject matter experts' (SME) generated variables: "Force posture decision-making performance" and "Mission urgency decision-making performance". Like Paper 1, each of these variables was measured repeatedly across three distinct crisis conditions. Through an examination of the commanders' context-specific actions within realistic decision-making tasks and by assessing their performance levels, this analysis aimed to improve our understanding of the decision-making environment of police and military commanders engaged in hybrid warfare. Its primary objective was to examine how the factors described by SCT can explain the responses of individuals to changing threats, thereby expanding our understanding of the role played by occupational background and phase transitions in collaborative crisis response.

In Paper 3, the predictor (exogenous) variables employed were Collective Self-Efficacy (continuous), Group Composition (ordinal), and Past Performance (continuous). These variables were selected due to their significance in SCT as fundamental determinants of human functioning (Bandura, 1999). Persistence was used as the mediator (endogenous) variable (continuous), given its role as a reliable indicator of performance in ambiguous circumstances, an area that scholars have emphasized as a crucial focus for future research (Schunk & DiBenedetto, 2021). Lastly, Wartime performance was used as the outcome (endogenous) variable (continuous). Despite the substantial amount of research conducted on

crisis management and the undeniable importance of effective decision-making, previous studies have largely overlooked the examination of performance specifically in wartime (Grier, 2012), leaving several unanswered questions regarding the wartime decision-making of individuals in positions of authority (Jervis, 2017a).

Method

The primary objective of this thesis was to analyze the actions of police and military commanders in response to hybrid warfare, which is characterized by a combination of violent and non-violent methods that traverse the boundaries between police and military roles (Schmid, 2021). Considering the manner in which hybrid attacks blur the functional relevance of established decision-making frameworks, scholars argue that these threats impose significant challenges on the targeted states' capacity to uphold national security and ensure public safety (Weissmann, Nilsson, Thunholm, et al., 2021). To improve our understanding of the decisions made and the actions taken within this particular context, our thesis drew on the assertions put forth by Bynander and Nohrstedt (2019), who emphasize the significance of acquiring knowledge regarding the challenges and opportunities faced by individuals in positions of authority. By grasping these decision-making processes, they contend that it becomes possible to develop more efficacious approaches to collaborative crisis response. In this thesis we therefore used quantitative methods to validate our hypotheses, and obtain empirical insights into the social cognitive dynamics of the functioning of commanding officers in the domain of police-military interactions.

To achieve this, our methodology drew inspiration from Bandura's seminal works (1986, 1997) on Social Cognitive Theory (SCT) and employed a quasi-experimental research design, incorporating high-fidelity headquarters simulations to investigate the decision-making of both individuals and dyads. The data collected was used to examine the degrees of disparity between police and military commanders and to evaluate the impact of phase transitions, encompassing the shift from peace to war, to post-conflict conditions, on their decision-making preferences and performance. Moreover, our thesis explored the potential associations between the factors described by SCT and differential decision outcomes, as well as improved performance. In sum, the research approach taken in this thesis was conceived for the purpose of making a scholarly contribution that addresses knowledge gaps in the realm of collaborative crisis response. The ultimate objective was to enhance the leadership behavior of police and military commanders.

Common methods

This section provides an overview of common research methods applicable to the thesis papers, including crisis scenarios, study samples, and our approach to participant recruitment.

Scenarios

The choice of hybrid warfare scenarios in the present thesis (depicted in Figure 5), was deliberately intended to accurately encompass the practical challenges inherent in making effective collaborative crisis response decisions. This deliberate selection aligns directly with our overarching objectives. Both Study 1 and Study 2 involved dynamic security threats, encompassing both violent and non-violent aspects. These settings were characterized by a multitude of ambiguous events and the involvement of various actors. Geographically, the scenarios revolved around hostile acts aimed at exploiting Norway's inherent vulnerabilities, spanning from Svalbard in the north to Skagerrak in the south, thereby constituting a national security crisis. To allow for realistic stimuli in the scenario, all mission vignettes were developed based on unclassified documentation from NATO's (2018) Occasus exercise module and inputs from subject matter experts (SME) at the Norwegian police directorate and national joint headquarters.

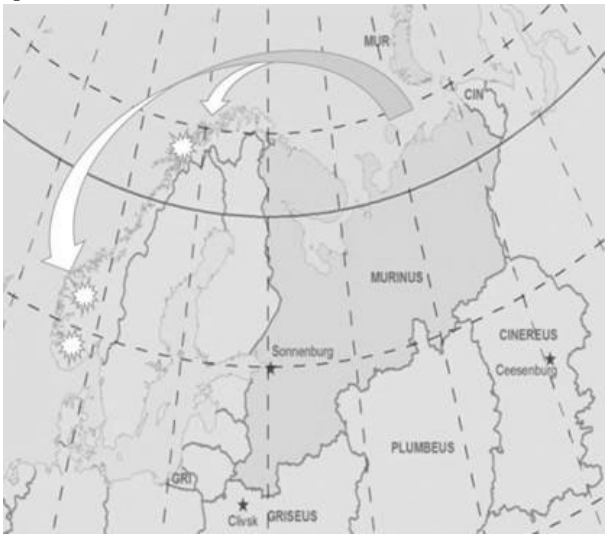

Figure 5: The strategic environment within which the simulations of this thesis were conducted. The scenarios were created by the authors during a research planning session. The illustration and fictitious states of Murinus, Griseus, Plumbeus, and Cinereus are based on the unclassified strategic scenario of NATO's (2018) Occasus exercise model.

Both scenarios encompassed tasks typically associated with both conventional police and military responsibilities. The tasks encompassed various responsibilities aimed at ensuring the security of public spaces and important individuals, conducting counterintelligence and counterterrorism operations, promptly responding to emergency situations, collecting and analyzing intelligence, ensuring the safety of hostages or individuals impacted by crises, protecting critical infrastructure, and preserving border integrity to prevent illicit activities. It is important to note that the roles outlined here are not exhaustive, and the specific tasks assigned to the participants varied depending on the security challenges and the legal framework in place during each phase of the simulation. These frameworks established the basis for participants to address threats and make informed choices. During peacetime, the framework emphasized the protection of individual rights and civil liberties. As the transitioning to war occurred, the framework underwent specific adjustments to effectively address the unique challenges posed by the situation. This included granting participants expanded responsibilities, and involving additional authorities regarding the use of force. Consequently, throughout the scenarios, the framework compelled the participants to prioritize both security and the need for judicial oversight.

Study samples

Study 1 (Paper 1 and Paper 2)

The participants in Study 1 consisted of volunteers who had prior experience from serving as police commanders (n = 43) or military commanders (n = 59). The inclusion criterion required a minimum of five years of active duty in either the police or military sectors. The mean age of the entire sample (N = 102) was 44.7 years (SD = 6.84; range 29- 58 years), with an average employment duration of 22.15 years in their respective sectors. Among the participants in the study, 15 individuals (15%) identified as female.

Study 2 (Paper 3)

The participants in Study 2 consisted of volunteers who had prior experience from serving as police commanders (n = 62) or military commanders (n = 76). The inclusion criterion required a minimum of five years of active duty in either the police or military sectors. Prior participation in Study 1 was defined as an exclusion criterion. The mean age of

the entire sample (N = 138) was 43.0 years (SD = 7.91; range 28- 62 years), with an average employment duration of 20.19 years in their respective sectors. Out of the total sample, 20 individuals (14%) identified as female.

Recruitment of participants

The recruitment of participants for both Study 1 and Study 2 followed a unified and standardized protocol. Although conducted at different points in time, the recruitment procedures were designed to be similar, with the aim of ensuring uniformity and enabling comparisons between the studies.

The recruitment process for Study 1 took place from November 2020 to April 2021 and included individuals from the headquarters of all military services and police districts. The researcher maintained regular communication with designated points of contact at the Norwegian joint headquarters and national police directorate. They provided written information and a briefing to co-workers that outlined the primary objective of the research project, which was to assess collaborative crisis response in contexts involving hybrid warfare.

This process involved the facilitation by the points of contact of the enlistment of individuals possessing relevant crisis management experience. If a person agreed to participate or required additional information, the point of contact would establish communication between them and the researcher. Subsequently, the researcher would initiate contact with the participant via phone or email to introduce the study, discuss concerns, and determine the appropriate time and location for their potential involvement. Participants were informed about their role, which entailed overseeing the operations of a national headquarters using a screen-based interface with multiple-choice answer options. All individuals were requested to volunteer and were explicitly informed of their right to withdraw from the study at any point. They were also informed that the simulation did not have a time limit and that it would be remotely observed by a researcher. Likewise, the recruitment procedure for Study 2 took place from August 2022 to January 2023. During this period, volunteers were sought from the headquarters and operations centers of all military services and police districts.

Specific methods

This section presents the specific methods of each thesis paper. This includes the procedures employed to conduct the studies, the instruments utilized to measure variables, and the statistical methods employed for analysis.

Procedures

Study 1 (Paper 1 and Paper 2)

The procedure for our first study entailed physical participation in a simulated headquarters exercise involving the management of hybrid attacks on Norway. Data related to force composition, posture, urgency, and decision-making performance was collected at the individual level. The data underwent comprehensive comparative analysis, encompassing both within-group and between-group comparisons of the police and military groups. Paper 1 focused on exploring the force composition data, while Paper 2 investigated the posture, urgency, and performance data.

Moreover, Study 1 utilized a repeated measures design, comprising 54 trials evenly distributed across three conditions: peace, war, and post-conflict (see Figure 6). During each trial, participants were tasked with making a series of decisions, which were assessed using Visual Digital Scales (VDS) and multiple-choice answer options. The decision-making tasks involved several aspects. The first task required assigning available troops to specific missions. The second task involved providing intent-instructions regarding the force posture of the troops. The third task entailed prioritizing missions as high, medium, or low urgency, based on strategies aimed at optimizing mission execution within specified timeframes. Participants were given the option to reject missions if they deemed this necessary. The transition from peace to war was initiated through a royal decree, which proclaimed the commencement of a state of war. Conversely, the transition from a state of war to the post-conflict phase was effectuated by repealing the previously declared state of war.

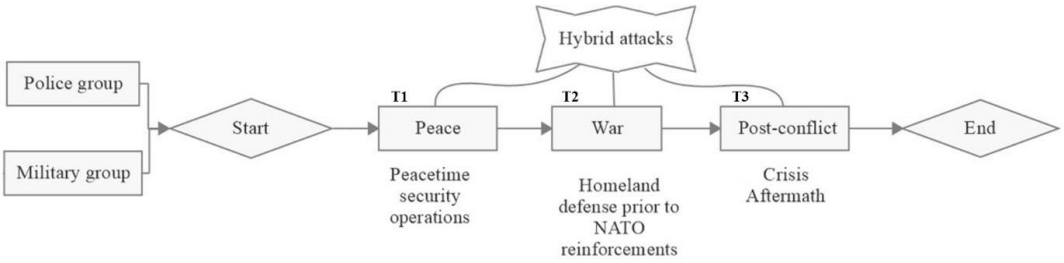

Figure 6: Design of Study 1.

Study 2 (Paper 3)

The procedure implemented in our second study, which is presented in Paper 3, was built on the design of Study 1. However, Study 2 was conducted in a collaborative setting using Microsoft Teams version 1.6.00.1381 as video conferencing platform. In this virtual context, data was collected at the dyad level to further investigate and deepen the understanding of the individual-level results reported in Papers 1 and 2. By incorporating dyads, Paper 3 sought to explore how crisis escalation influenced the decision outcomes of police and military commanders collaborating within a headquarters context to counter hybrid attacks. To ensure a balanced representation, the commanders were carefully selected based on age and seniority, and categorized into three dyad categories: (1) all-police, (2) all-military, or (3) mixed police/military. In addition to assessing decision-making performance, Study 2 also measured social cognitive variables, including persistence, dyad composition, and collective self-efficacy, across a total of 36 trials (12 trials in the peace condition and 24 trials in the war condition). Figure 7 provides a visual representation of the research design employed in Study 2.

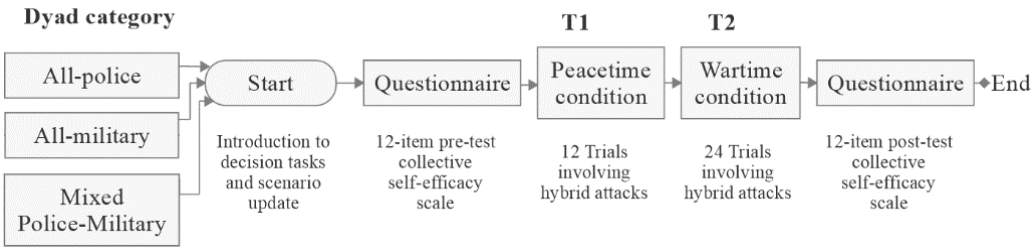

Figure 7: Design of Study 2.

As in Study 1, the participants in Study 2 were initially assigned the task of mobilizing resources for specific missions. The second decision-making task involved providing instructions regarding the level of effort that these resources should exert in the face of adversities. The third decision-making task was to prioritize each mission as high, medium, or low in terms of importance. Participants were also given the option to reject missions if they deemed this appropriate. The transition from peace to war was established through a royal decree that declared a state of war. Before and after the actual simulation, participants completed a collective self-efficacy questionnaire, with the purpose of assessing their perceived efficacy as a command dyad.

Instruments

Study 1 (Paper 1 and Paper 2)

The stimuli of Study 1 were physical handouts (i.e. organizational chart, attribute list of subordinate forces, legal information, maps, intelligence updates and policy documents) and digital slides (i.e. mission vignettes and multiple-choice answer options) with pictures and text projected onto the screen. The computer software iMotions (2022) version 9.1.0.6 controlled the sequence of the slides and recorded all the participants' responses. Participants experienced the same phases in a standardized sequence, allowing investigation into whether the conditions influenced their efforts and resource allocation when faced with challenges. Demographic information (age, gender, profession, years of employment and operational experience) were collected on the day of the simulation, using a printed questionnaire.

Force composition was measured by multiple-choice answer options in which the participants could choose any combination of the available police and military forces (see Table 1). The force composition data comprised the following categories: (1) Police forces (a single police unit or combination of police units); (2) Military forces (a single military unit or any combination of military units); (3) Interagency forces (a combination of at least one police and one military unit); and (4) Reject (none of the available forces).

Police	Military	Interagency
Counter-terrorism police	Special operations forces	A combination of at least one police and one military unit
Local SWAT team	Home guard rangers	
Police security service	Counter-intelligence	
Uniformed armed police	Armed military guards	

Table 1: Available resources.

Force posture was assessed using a 10-centimeter Visual Digital Scale (VDS) for each mission. Participants indicated their force posture guidance by placing a marker on the VDS. The scale's anchor points were defined as "be very defensive", emphasizing the avoidance of risks related to escalation, and "be very offensive", allowing for the use of all necessary coercive techniques. The midpoint of the VDS indicated the overall objective of maintaining the status quo, while also permitting the force to hold its ground, with a cautious approach toward escalation. To calculate the force posture variable, the sum of the centimeter measurements was derived from the 18 measurements obtained in each phase. This calculation provided a complete measure of force posture, considering all the different assessments carried out during the simulation.

Mission urgency was assessed using a 10-centimeter VDS for each mission. Participants indicated their level of mission urgency guidance by placing a marker on the VDS. The scale's anchor points were defined as "No priority", representing a response at one's own convenience, and "Very high priority", indicating a need for immediate action. The midpoint of the VDS represented the threshold of "responding within the next 24 hours". To calculate the mission urgency variable, the sum of the centimeter measurements was derived from the 18 measurements obtained in each phase. This summation provided a comprehensive measure of mission urgency across the multiple assessments conducted throughout the simulation.

Decision-making performance was assessed by engaging one police and one military Subject Matter Expert (SME), both of whom were unaware of the experimental setup. The selection of these SMEs was based on their extensive academic qualifications and professional expertise acquired through more than 30 years of involvement in various security crises. For each mission completed by each participant, the SMEs assigned ordinal scores to both the force posture and mission urgency decisions. These scores were categorized as follows: 0 denoting low performance, 1 indicating medium performance, and 2 representing high performance. To determine the overall force posture performance, the SME ratings for force posture were aggregated by adding up the 18 force posture performance scores within each phase. Similarly, the SME ratings for mission urgency were computed by adding up the 18 mission urgency performance scores within each phase. The composite scores of both SMEs were computed to calculate the intraclass correlation coefficient (ICC) for both variables. The force posture-performance interrater reliability showed a very good ICC of

.800 ($p < .001$). The mission urgency-performance interrater reliability showed an acceptable ICC of .715 ($p < .001$).

Study 2 (Paper 3)

In relation to the instruments employed in Study 2, the stimuli employed encompassed a diverse array of digital materials. These materials included maps, mission vignettes, intelligence updates, and policy documents, all of which were presented as digital slides projected within the virtual meeting room. The collaborative activities took place through the utilization of the Microsoft Teams platform.

Furthermore, persistence was measured through two distinct elements for each trial in the war condition: the mobilization of resources to conduct missions and the instructions regarding effort expenditure. The former was quantified on a scale ranging from 0 to 4 for each trial, where 0 denoted no troops allocated and 4 indicated the allocation of more than three troops. The latter was measured using a 7-point Likert scale for each trial, where 0 represented very restrictive resource expenditure and 6 represented unrestricted resource expenditure. To compute the persistence variable, the mean scores of the two elements were added up across the 24 missions conducted in wartime. This yielded a comprehensive measure of persistence, encapsulating both resource mobilization and effort expenditure across the entire set of missions.

Peacetime performance was evaluated through the involvement of two SMEs who assessed the decision-making of the dyads concerning task organization (specifically, the selection of troops for missions) and mission prioritization during the initial 12 trials of the simulation's peace phase. The SMEs, unaware of the identities of the participants, assigned a score to each dyad for each mission on a scale ranging from zero to six, with zero indicating poor performance and six indicating excellent performance. The peacetime performance variable was subsequently determined by calculating the mean score based on the assessments provided by the SMEs.

Wartime performance was calculated by the same SME protocol as peacetime performance. Consequently, wartime performance was determined on the basis of the mean score derived from the decision-making of the dyads throughout the 24 trials conducted during the war phase. In terms of performance measurement, the interrater reliability of the SME ratings demonstrated an ICC of .80 (.76 for peacetime performance and .84 for wartime

performance). These results indicate a good level of reliability among the SMEs involved in the assessment process.

The measurement of pre-test and post-test collective self-efficacy was carried out through the utilization of a 12-item questionnaire, developed in accordance with Bandura's (2006a) guidelines for constructing efficacy scales. Each item in the questionnaire utilized a 7-point Likert scale, where 0 represented "highly unlikely" and 6 represented "highly likely". Each item assessed the participants' perception of their collective self-efficacy in relation to hybrid warfare issues. The items were designed to reflect the same format and level of difficulty as those encountered during the simulation, ensuring relevance and comparability.

Statistical analyses

In all of the studies conducted, the data was meticulously transcribed into a statistical software package, SPSS statistics (version 27) and Jamovi (2023) version 2.2.2, for the purpose of conducting statistical analyses. Furthermore, IBM SPSS AMOS (version 28.0.0) was employed specifically for the path analysis conducted in Paper 3. It is important to note that there were no instances of missing data observed in the collected datasets.

Paper 1

Multinominal logistic regression tests were used to examine the main effects of Sector (occupational background) and Phase (the transition between conditions: peace, war, and post-conflict) on the police and military groups' decision-making regarding force composition. In addition, the interaction effects of Sector × Phase, and Sector × Phase × Operational experience, were investigated.

Paper 2

Mixed analysis of variance (ANOVA) tests was used to examine the effects of Sector and Phase, and the police and military groups' decisions regarding force posture as mission urgency, as well as to analyze the SME ratings of decision-making performance.

Paper 3

Path analysis was used as a statistical method to examine the relationships and predictive pathways among several social cognitive variables. The variables of interest were dyad composition, collective self-efficacy, past performance in peacetime, actual performance in wartime, and the potential mediating role of persistence.

Ethics

The research project in its entirety, along with the study protocols pertaining to all three papers, received approval from multiple authorities, including the Norwegian Center for Research Data (Ref No. 928103), the Norwegian Defense University College, the National Police Directorate, and the respective local leaders of each participant's organization. Prior to their inclusion in the study, informed consent was obtained from all participants through both oral and written means. It is important to note that all participants participated voluntarily in the study, without receiving any financial compensation. Moreover, the participants were assured that their anonymity would be preserved throughout the research project, and they were explicitly informed of their right to withdraw their consent at any time, without any need to provide an explanation. These instructions involved clearly outlining the measures taken to protect any potential sensitive information pertaining to their organizations. The researcher responsible for interacting with the participants possessed valid security clearance granted by both NATO and the national Norwegian authorities. This clearance enabled them to engage in discussions regarding classified information within the context of the thesis. However, it is important to note that, although the researcher had access to such information, no classified data was collected or gathered throughout the course of the research. Nevertheless, to ensure the confidentiality of the participants, all data collected was stored in a manner that safeguarded the participants' identities. This storage was carried out within the secure facilities and servers of the Norwegian Armed Forces.

Results

Paper 1

When analyzing the Sector and Phase variables, the descriptive statistics presented in Table 2 provide preliminary indications of how occupational background and phase transitions shape the police and military commanders' decision-making preferences.

	Decision preference	Sector	Phase			Mean
			Peace	War	Post-conflict	
Frequency (percentages)	Police task	Police	35.8%	23.9%	35.1%	31.6%
		Military	40.8%	27.3%	34.9%	34.3%
	Military task	Police	14.7%	26.1%	18.7%	19.9%
		Military	21.8%	31.9%	23.2%	25.6%
	Interagency task	Police	46.4%	48.7%	42.6%	45.9%
		Military	30.6%	37.9%	34.7%	34.4%
	Reject	Police	3.1%	1.3%	3.5%	2.6%
		Military	6.8%	2.9%	7.3%	5.6%

Table 2: Frequency table showing the relative frequency, in percentages, of each decision in relation to the total number of observations within each group throughout the three conditions of the scenario.

Even though the frequency table sheds light on the hypotheses of Paper 1 concerning the influence of Sector and Phase, a multinomial regression analysis was necessary to determine the interrelationships between these variables and incorporate the impact of operational experience.

The stepwise multinominal logistic regression indicated how occupational background and operational experience impact the type of resources commanders prefer, based on the phase in which threats occur. The analysis demonstrated several significant ($p < .05$) differences in the ways the transitions between war and peace had different effects on the police and military commanders' decision-making.

With regard to the commanders' postulated predisposition towards favoring their own sector's forces (H1), the analyses demonstrated mixed support. A main effect showed how police and military commanders were 19% more likely to use their own sector's forces unilaterally than to use the other sector's forces. Similarly, interaction effects demonstrated how military commanders were 98% more likely to prefer military forces over police forces in war. Conversely, police commanders were 57% less likely to prefer police forces over military forces in war relative to peacetime.

It is noteworthy that when an outcome is characterized as being “100% more likely”, this infers that the likelihood has doubled in relation to the baseline parameter. To exemplify the aforementioned result, consider a scenario where military commanders are managing a hostage rescue mission during times of war. The likelihood of their preference for employing military forces, rather than police forces, was determined to be 98%. This suggests that the military commanders were twice as inclined to opt for military forces in hostage rescue missions during wartime, as opposed to peacetime. Likewise, when a comparison is expressed as being “50% less likely”, this infers that the likelihood has decreased by half.

Moreover, the data also supported our hypothesis of a greater preference for interagency forces in wartime than in peacetime (H2). The results showed how military commanders were 113% more likely to choose interagency forces over police forces in wartime. Similarly, police commanders were 58% more likely to prefer interagency forces over police forces in wartime. However, police commanders were 32% less likely to prefer interagency forces over military forces in wartime, relative to peacetime.

Concerning the hypothesized decreased preference for interagency forces in the post-conflict phase (H3), police commanders demonstrated no support for this hypothesis, while it was contradicted by the military commanders. They were 72% more likely to choose interagency forces over police forces, and 46% more likely to choose interagency forces over military forces in the post-conflict phase than in peacetime.

Finally, the analysis showed support for our hypothesis that more experienced commanders would demonstrate a higher preference for interagency forces (H4). In peacetime, the data described how the police and military commanders’ preference for interagency forces increased per increment of operational experience. However, in the war and post-conflict phase this effect was only demonstrated by the police commanders.

Paper 2

When examining the Sector and Phase variables to determine their influence on the force posture and mission urgency variables, while considering the differences between the police and military groups, as well as the variations within each group across the three conditions of the simulation, the mixed ANOVA tests revealed notable findings. As illustrated in Figure 8 and Figure 9, the analyses indicated that both police and military commanders exhibited more offensive postures and higher levels of urgency during wartime, compared to otherwise similar tasks conducted in periods of peace and post-conflict. This finding provided

support for the first hypothesis (H1a) of Paper 2. However, the results partially contradicted H1b, which suggested that both groups would revert to peacetime levels of posture and urgency during the post-conflict phase. Specifically, it was observed that military commanders exhibited more offensive force posture levels during peacetime, as opposed to the post-conflict phase.

Furthermore, the findings provided support for H2a, as they described how police commanders had higher levels of force posture compared to military commanders during the post-conflict phase, and higher levels of urgency compared to military commanders in both peacetime and post-conflict phases (see Figures 8 and 9). However, in contrast to H2b, the results indicated that military commanders demonstrated lower levels of urgency than police commanders during wartime (see Figure 9).

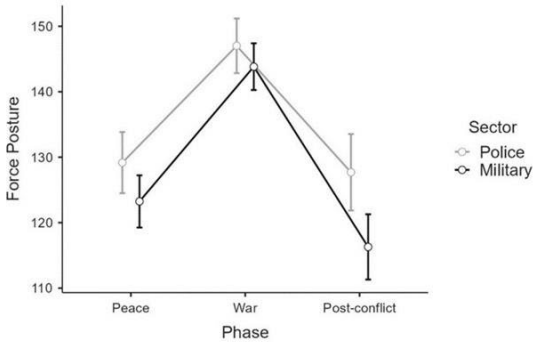

Figure 8: The police and military commanders' force-posture levels in the three phases. Note: Error bars indicate 0.95 confidence intervals.

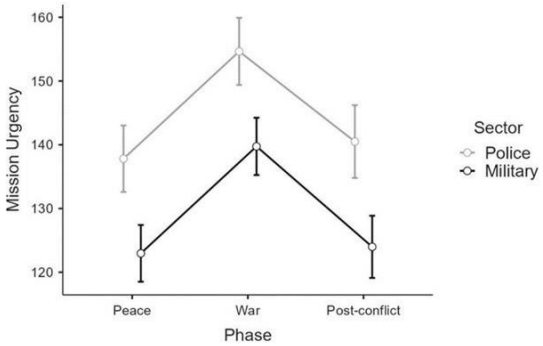

Figure 9: The police and military commanders' mission-urgency levels across the three phases. Note: Error bars indicate 0.95 confidence intervals.

Moreover, the analyses revealed noteworthy differences in the decision-making performance of police and military commanders across different conditions, encompassing the transition from peace to war and into the post-conflict phase. As depicted in Figure 10 and Figure 11, the decision-making performance of commanders during wartime concerning force-posture and mission urgency exhibited higher ratings compared to the levels observed during the peacetime and the post-conflict phases. It is noteworthy that our hypothesis (H3a) suggesting that military commanders would outperform police commanders in wartime was not supported. Similarly, H3b was not supported, as the decision-making performance of police commanders did not surpass that of military commanders during the peacetime and post-conflict phases.

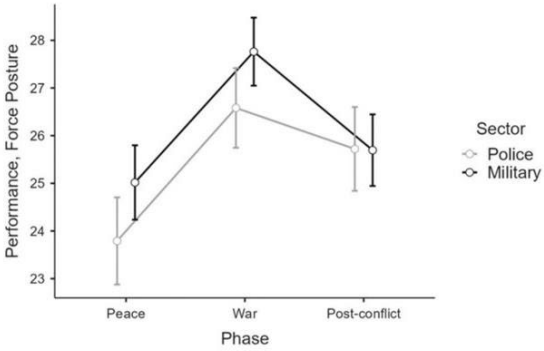

Figure 10: SME ratings of the commanders´ force posture decision-making performance across the three phases. Note. Error bars indicate 0.95 confidence intervals.

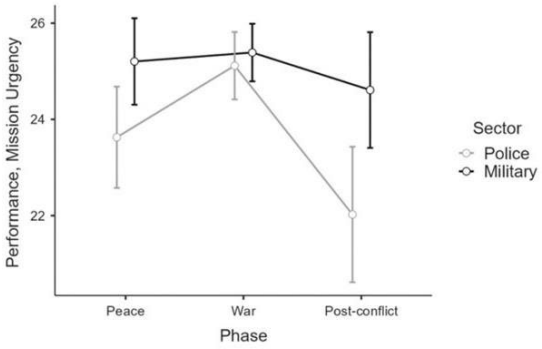

Figure 11: SME ratings of the police and military commanders' mission-urgency decision-making performance across the three phases. Note. Error bars indicate 0.95 confidence intervals.

Paper 3

In the examination of the relationships between dyad composition, peacetime performance, collective self-efficacy, and persistence, with a focus on assessing the direct and indirect effects of these social cognitive variables on wartime performance, a path analysis was employed. The path analysis described how these variables could explain a large proportion ($R^2 = .54$) of wartime performance. Moreover, this approach facilitated the evaluation of the strength and significance of the relationships among these variables. The following path coefficients were found to be statistically significant at the 0.05 level:

1. The positive indirect effect of dyad composition on wartime performance through the mediation of persistence ($\beta = 0.08$). This suggests that the composition of dyads had a positive impact on wartime performance, and that this effect was explained by the level of persistence demonstrated. Although this result aligns with the fourth hypothesis (H4) proposed in Paper 3, it also contradicts H1, as will be further elaborated upon in the subsequent discussion section of the thesis.
2. The negative direct effect of persistence on performance ($\beta = -0.33$). This indicates that higher levels of persistence are associated with lower performance outcomes. In other words, an excessive level of persistence may impede overall performance. This result provides support for hypothesis H4.

3. The negative direct effect of peacetime performance on persistence (β = -0.50). This suggests that higher levels of performance during peacetime are associated with reduced persistence. It implies that when performance is strong during peaceful periods, individuals or groups may become less persistent in their efforts. Although this finding does not directly address any hypotheses, it provides valuable insights into the factors influencing persistence.
4. The negative direct effect of dyad composition on persistence (β = -0.24). This indicates that the composition of the dyads themselves influenced the level of persistence demonstrated. More specifically, the fact that the mixed police-military dyad was ordered as the first group in the analysis implies that unilaterally organized dyads exhibited lower levels of persistence. Although this finding does not directly address any of our hypotheses, it provides further insights into the factors influencing persistence.
5. The positive direct effect of peacetime performance on wartime performance (β = 0.45). This implies that higher levels of performance during peacetime are associated with better performance outcomes during wartime. This result provides support for hypothesis H2.
6. The positive indirect effect of peacetime performance on wartime performance through mediation of persistence (β = 0.17). This implies that the positive influence of peacetime performance on wartime performance was partially accounted for by the demonstrated level of persistence. In this relationship, persistence served as a mediator. This aligns with H4 and provides further support for hypothesis H2.
7. The positive direct effect of pre-test collective efficacy on post-test collective efficacy (β = 0.86). This finding indicates that higher levels of collective efficacy measured before the simulation are associated with higher levels of collective efficacy measured afterward. It suggests that the initial level of collective efficacy has a positive influence on subsequent levels. Although this finding does not directly address any of our hypotheses, it provides valuable insights into the factors influencing collective self-efficacy.

The path analysis' outcomes for the variables examined in Paper 3 are shown in Figure 12 in the form of standardized and unstandardized regression weights. The reference values

for effect sizes for regression weights are as follows: Small effect (S), less than 0.10; Medium effect (M), between 0.10 and 0.30; Large effect (L), 0.30 or more (Field, 2013).

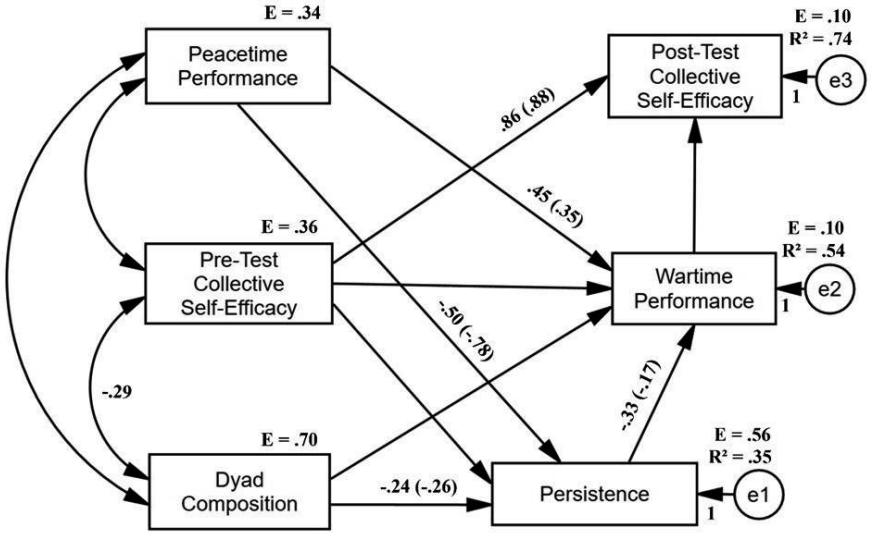

Figure 12: Path analysis output. Path coefficients in the form of standardized regression weights appear outside parentheses. Only statistically significant correlation/path coefficients are shown. Model fit summary: AGFI =.950, TLI = 1.045, NFI = .992

Discussion

The primary aim of this thesis was to investigate the influence of occupational background (police/military) and phase transitions (peace/war/post-conflict) on the decision-making preferences and performance of commanding officers within the context of hybrid warfare. This research work, comprising three papers, intends to address existing gaps in knowledge within the field of collaborative crisis response, with the ultimate goal of enhancing the leadership behaviors demonstrated by police and military commanders. To accomplish this, the thesis examined the conduct of both individuals and command dyads. In pursuit of these objectives, the thesis was grounded in Bandura's (2023) Social Cognitive Theory (SCT), providing a theoretical framework for the study.

Moreover, in light of the growing concerns among government officers in the Western world regarding flawed decision-making and insufficient cross-sectoral interactions during security crises (Peters, 2021), our research investigated the decisions of individuals positioned within a national headquarters. Effectively dealing with hybrid warfare at this level of leadership necessitates deliberate responses, not only due to the inherent difficulties that arise in collaborative efforts within this decision-making environment (Marchau et al., 2019), but also because the efficacy of the security frameworks utilized by targeted states is a subject of debate (Kapucu et al., 2010). Some argue that current thinking on security is ill-suited to address the multifaceted nature of hybrid warfare, calling for comprehensive reforms and adaptive approaches (Iancu et al., 2016). Others believe that while there may be shortcomings, existing concepts can be enhanced through improved coordination, information sharing, and integrating diverse capabilities (Johnson, 2021). Owing to these divergent perspectives, our research aimed to further elucidate and expand this discourse by incorporating empirical assessments of the manifestation and effectiveness of prevailing standards and strategies employed by individuals holding positions of authority within the police and military sector. This involved the collection and analysis of data derived from original research conducted with the involvement of high-ranking officers within a high-fidelity headquarters simulation exercise.

While the detailed findings of each analysis are expounded upon in the thesis papers, the subsequent sections provide a summary of their main conclusions and their implications within the field of collaborative crisis response. Following the logical progression described by Hayes and Rockwood (2020), the initial part focuses on discussing the degree to which an occupational background from either the police or military affects the decision-making

preferences of individuals in positions of authority. The second part explores the temporal aspects of this phenomenon, providing a more nuanced understanding of how decision-making preferences are shaped by phase transitions and the escalation tendencies of a crisis. The third part delves into the potential decision-making outcomes stemming from these effects and their predictive capacity concerning decision-making performance in hybrid warfare contexts, whether involving individual commanders or dyads comprising both police and military commanders. The fourth part encompasses methodological considerations, acknowledges the limitations of the thesis, and suggests potential avenues for future research directions.

Discussion of the main findings

The effect of occupational background

The first research question (RQ1) of the thesis focused on a core claim of SCT that underscores the significance of considering previous occupational experience when examining the activity choices of professionals (Tschannen-Moran & Hoy, 2007), and how this previous experience may alter their performance in dynamic work-related settings (Srikanth & Jomon, 2013). According to SCT, the actions of professionals are largely determined by their commitment to meeting personal and organizational standards of adequacy. This commitment motivates their decision-making preferences, which are influenced by how well available options align with the perceived demands of the situation (Zimmerman, 2000).

On the commanders' organization of subordinate assets. The results reported in Paper 1 suggest that the police and military commanders construed the relevance of their standards across the simulation in different ways. This aligns with how Bass and Riggio (2005) assert that individuals in positions of authority tend to demonstrate a profound dedication to their personnel, their unit, and their assigned responsibilities (p. 36). For example, the commanders in the current thesis demonstrated a greater inclination to use assets from their respective sectors, rather than relying on resources that were less familiar to them. This suggests a tendency towards employing assets within their immediate chain of command, underscoring a diminished dependence on external support. One plausible explanation for this finding is that the commanders, by employing unilateral approaches, may have experienced heightened efficacy and self-regulatory capacity when utilizing the familiar assets of their own sectors.

According to SCT, these self-referent thoughts may stem from a variety of factors, such as a perceived need for urgent and offensive action, a desire to maintain control over the operational aspects within their area of responsibility, or a belief in the effectiveness of their own forces.

However, it is essential to acknowledge that the inclination towards unilateral approaches can be influenced by the characteristics of those in charge, their behaviors, and the nature of the crisis. As described by Parker et al. (2020), a diverse set of individuals may interpret events differently, with some perceiving a greater need for cross-sectoral interaction compared to others. In this context, it is noteworthy that our results showed that commanding officers possessing extensive operational experience demonstrated a greater inclination towards collaborative approaches compared to those with less experience. These seasoned officers skillfully utilized interagency forces and actively engaged with other relevant actors to establish comprehensive task forces, thereby demonstrating a notable emphasis on adaptability, and acknowledging the ambiguous nature of hybrid warfare. This highlights the assertion made by Klein (2011) regarding the importance of taking prior experience into account when evaluating the decision-making of various professionals and their interactions within dynamic field settings.

In view of the context of our thesis, this makes sense, since the previous experience of police commanders is mainly from taking charge of immediate operations and demanding responsive and dynamic decision-making (Lundgaard, 2021). In contrast, a military commander's experience is based on more deliberate operations, and often implies a broader dimension of time and space (King, 2019). Consequently, their backgrounds exhibit inherent contrasts. The practical relevance of this distinction is twofold. Firstly, the police and military have shared crisis response responsibilities (Tamnes, 2015), so that understanding the impact of their backgrounds would be important to enable effective collaboration. Secondly, research has shown significant correlations between individuals with contrasting backgrounds and their performance in various work-related tasks and settings (DeLong-Hamilton et al., 2016). These scholars identify distinct values, judgments, and divergent frustrations and experiences as inherent factors influencing the capacity of professionals to make effective decisions and take appropriate action.

In collaborative contexts, Gist (1989) outlines how individuals' backgrounds and their enactive experiences, combined with vicariously observing the actions of others in similar

roles, can significantly impact their self-regulatory strategies. This suggests that those responsible for managing police-military interactions may be more inclined to engage in decision-making that enhances performance when they not only draw conclusions from their personal successes, but also learn from the successes and failures of their subordinates. In line with this reasoning, our findings indicate that both the commanders' backgrounds and the sectoral affiliations of their subordinates exerted a substantial influence on the commanders' perception of progress and subsequent decision-making processes. For instance, by accurately recognizing the effectiveness of interagency methods in establishing trust and gathering intelligence from local residents in wartime, commanders can gain valuable insights to adapt and integrate similar strategies into their existing protocols. Subsequently, as they become better acquainted with these methods, they may opt to integrate them into their standards of adequacy. In light of our findings, it can thus be inferred that the changing preferences of the commanders may be linked to a perceived decrease in the relevance of sector-specific approaches as the crisis escalated.

However, given the inherently ambiguous nature of organizational settings that involve managing the efforts of others towards desired outcomes (Mintzberg, 1989), it is often insufficient for professionals to rely solely on enactive and vicarious experiences to self-regulate or adjust their preferences. Acknowledging this challenge, Bandura (2009) suggests that individuals are likely to reflect on their past experiences in order to comprehend and address informational gaps present in current events. Given the divergent backgrounds of the participants in the current thesis, comprising both police and military personnel, they may have encountered difficulties in accurately evaluating certain aspects of the operational environment. As discussed by Williams (2021) and elaborated by our results, these challenges can to a great extent be attributed to two factors. Firstly, a potential limitation in operational experience within specific task domains may have impeded the commanders' ability to thoroughly evaluate unfamiliar aspects of the operational environment. Secondly, the presence of multiple ambiguities, including sectoral boundaries, conflicting objectives, and time constraints inherent in a crisis, may have further contributed to the difficulties encountered when considering the relevance of innovative methods as response measures during a crisis.

Paper 1 thus provides important insights into the correlation between occupational background and sectoral differences in the police-military interface within the context of

hybrid warfare. The increased level of collaboration observed during wartime could be interpreted as being driven by a recognition of the advantages linked to shared objectives, together with the necessity of deviating from their established standards to facilitate capability integration and foster interagency coordination. Nevertheless, our analysis showed that this effect waned during de-escalating conditions, particularly among police commanders. On the one hand, this confirms that the more intense the conflicts are, the more likely individuals are to promote collaboration. Conversely, it also indicates that during de-escalation, certain commanders may focus more on the familiar features of the crisis and the obligations associated with their peacetime duties. Our findings not only elaborate on previous research (Walsh et al., 2012) describing the varied preferences exhibited by experienced decision-makers in cross-sectoral settings, but also exemplify Bandura's (1986) assertion that personal and professional standards shape individuals' perceptions of their own abilities and subsequently influence their response to change. Additionally, our analysis provides empirical insight into the scholarly discourse regarding the perceived viability of interagency measures in countering hybrid warfare (Tagarev, 2021).

On the commanders' guidance for execution of operations. The sector differences reported in Paper 2 expand upon the aforementioned findings and refine existing research by revealing a strong correlation between domain-specific skills and variations in decision-making outcomes among professionals (Molina-Mula & Gallo-Estrada, 2020). Specifically, our results underscore the impact of personal and organizational standards and how this influence may vary, depending on the perceived relevance of these standards in ambiguous settings. The analysis of Paper 2 revealed that police commanders exhibited a greater inclination towards urgent action, prioritizing immediate responses over postponing operations in general. On the other hand, military commanders demonstrated a preference for utilizing less force compared to their police counterparts, particularly in the post-conflict phase. A plausible explanation for these differential decision-making outcomes lies in the varying levels of robustness in the standards upheld by police and military commanders. In particular, their distinct prior experiences appear to have instilled varying threat response thresholds in them.

In this context, Bandura (1986) highlights the influence of domain-specific expertise. This explains how the commanders' selective interpretations of events would have provided them with a mix of pros and cons, thereby impacting divergent self-regulatory outcomes that

shape the preferences determining their decision-making outcomes. On this note, our results indicate how police and military commanders seem to have selectively paid attention to different aspects of the functional significance of actions, favoring familiar aspects of their respective operational concepts, while disregarding less familiar ones.

One possible reason that occupational background consistently influenced activity choices across all crisis conditions is that the threats associated with hybrid warfare, such as sabotage and subversion, are central to both police and military work. Furthermore, it is plausible that commanders generalized their professional standards to apply across operational tasks in various contexts, including peace, war, and post-conflict scenarios. This observation illustrates the transboundary nature of hybrid warfare (Fogt, 2021) and lends support to the hypothesis that standards can be generalized across domains that exhibit similar modes of functioning (Bandura, 1997). Despite the arguments raised by critics regarding the varying strength of such transfers across domains (Bong, 2001), our results seem to align with the theoretical framework of SCT and experts' research (Mosier et al., 2018) by suggesting how standards developed for certain tasks in peacetime are transferred to different tasks within this domain, and even transversely to the war and post-conflict domains.

On this note, the comparable offensiveness levels displayed by both police and military commanders suggest a convergence in their approach to hybrid warfare. These shared understandings seem to have served as parameters for the execution of operations, ensuring that commanders from both sectors adhered to similar standards when responding to threats. This compelling observation indicates the equal effectiveness of the operations conducted by the commanders of both entities. It is noteworthy that, despite having contrasting backgrounds, no significant differences in decision-making performance were observed between police and military commanders. Indeed, neither Paper 1 nor Paper 2 established a significant correlation between decision-making performance and sector background, although our results could be interpreted as favoring the latter in the post-conflict phase.

Furthermore, the police and military commanders' differential decision-making outcomes, as illustrated in our analyses, lend empirical support to scholars discussing the continued importance of bolstering national preparedness (Longva, 2021) and developing more effective police-military interfaces not only during day-to-day activities, but also in times of war (Tamnes, 2015). Although considerable efforts have been made to align the approaches of the police and military through more effective communication, coordination,

and shared understanding in collaborative settings (Storberget et al., 2023), our findings indicate that conflicting preferences can still present a potential obstacle to their effectiveness during crucial stages of security crises. Consequently, it can be argued that the demonstrated influence of occupational background can serve as a benchmark when considering enhancements of total defense initiatives (Larsson et al., 2023) and other cross-sectoral settings.

The observed sector differences are important to note because collaborative efforts are more likely to encounter conflicts if the involved parties have diverging standards, as opposed to when they are mutual (Donelson & Burnette, 2010). Within the context of police-military interactions, for instance, such differences could lead to disagreement on issues such as the appropriate level of force, rules of engagement, information sharing, and coordination of operations. Our findings thus underscore the importance of understanding the psychological inclination to rely on assumptions aligned with past experience (Elstein et al., 1990) and support the arguments of scholars who posit that urgent and offensive actions are favored when crises escalate and war becomes inevitable (Jervis, 2017a). Despite the identified disparities between police and military commanders in the present thesis, the assertions posited by these scholars, when considered alongside our own findings, underscore a crucial point. Specifically, in crises that escalate to the point where the prospect of all-out war becomes a distinct possibility, individuals in positions of authority are increasingly likely to recognize the vital significance of time and the inherent limitations of relying solely on defensive measures to ensure the preservation of national security and public safety. Our results furthermore demonstrate that, in such circumstances, those in charge may tend to exhibit a greater inclination towards endorsing deliberate and interagency-oriented responses.

Overall, the sectoral differences demonstrated in Papers 1 and 2 underscore the importance of establishing shared standards of adequacy between the police and the military, to ensure that those responsible for the collaborative crisis response have the skills required to conduct efficient operations across a wide range of security tasks. In this regard, our findings shed light on certain behavioral and temporal aspects of hybrid warfare involving threats that traverse the functional boundaries between police and military responsibilities. It is vital to acknowledge how hybrid threats requiring innovative cross-sectoral approaches, which may contradict existing standards, can result in the dismissal of valuable options. We therefore propose that the primary focus for improvement should be to develop shared standards that

enable police and military commanders to seize opportunities in the face of hybrid warfare. For instance, by bringing together stakeholders from both the police and military, enabling regular collaboration, information sharing, and joint planning, the two entities could establish protocols that facilitate the collaborative management of potential hybrid threats encountered in their day-to-day operations. By doing so, they could cultivate a deeper understanding at all levels of leadership, fostering information-sharing that enables police and military commanders to make informed decisions about hybrid threats, as they arise. These initiatives not only mirror the existing arrangements of national intelligence services, but also align with recommendations for enhancing national preparedness (Sunde et al., 2023). In particular, by capitalizing on interoperability the two entities could address the sectoral differences identified in the present thesis, specifically those pertaining to urgency and the use of force.

The effect of phase transitions

The thesis' second research question (RQ2) focused on another core claim of Social Cognitive Theory (SCT), namely that efficient functioning in changing contexts is related to both enactive and vicarious cognitive processes, whether they are self-regulatory or self-reflective in essence (Bandura, 1986). Crisis management research emphasizes the significance of individuals' self-regulatory capacity (Trachsler & Jong, 2020) and the link between proactive decision-making and leadership effectiveness (Boin & 't Hart, 2010). In this context, Bandura (1999) describes how feedback ambiguity influences human functioning, creating fertile grounds for potential misjudgments that are contingent upon the specific type of endeavor pursued. This encompasses factors such as the timing, location, and attributes of the individuals towards whom actions are directed. (p. 174). As suggested by Schunk and DiBenedetto (2021), events regarded as reliable sources of information in normal circumstances might be perceived as unreliable in a crisis. The selective nature of self-referent thoughts (Jones, 1989) thus implies that the ambiguities induced by hybrid warfare should have distinctive influences on commanding officers as events progress and escalate into a full-scale war. Our findings indeed demonstrate differential decision-making preferences between police and military commanders throughout the various phases of such security crises. However, we also observed certain similarities in their strategies, which we explore in the next section.

On the commanders' organization of subordinate assets. The analysis reported in Paper 1 provides support for the ways in which Bandura (1999) explains how the impact of standards formed during routine activities tends to diminish as events progress into unfamiliar contexts. Accordingly, if things are not going as expected, or if the perceived normalcy of the situation deteriorates, individuals should be more willing to explore different ways of doing things, especially if their usual methods are interpreted as unsuitable for handling new and unpredictable events (p. 188). This claim is supported by our observation that commanders exhibited a greater preference for untried interagency solutions during the war phase. In the context of crisis response, our result lends support to earlier research discussing differential decision-making during times of war compared to periods of peace (Levi & Tetlock, 1980; Suedfeld & Bluck, 1988). In particular, it supports the arguments put forth by Larssen and Dyndal (2020) by demonstrating increased levels of cross-sectoral collaboration during wartime compared to peacetime. Our observation of commanders' greater preference for organizing police and military assets into interagency task forces during the war phase thus adds to this body of research by providing empirical evidence of how individuals are more willing to deviate from established standards and explore alternative approaches in unfamiliar contexts.

Although our analysis demonstrated that the transition from a state of peace to a war phase heightened commanders' inclination towards interagency solutions, it also showed police-military sectoral differences in this regard. Escalation strengthened the preference of military commanders for interagency solutions over alternative options. In contrast, the preference of police commanders for interagency forces in times of war increased when the only alternative option was to employ police forces, but not when this applied to military forces. Moreover, while the preferences of police commanders returned to pre-war levels during the post-conflict phase, military commanders continued to prioritize interagency actions, even during de-escalation. These findings provide further support for Bandura's (1999) predictions regarding the interpretation of change and ambiguity, which suggests that these factors can either justify adjustments to existing standards or the adoption of new standards. In this context, it is worth noting that research shows that many individuals tend to exhibit inhibitive self-regulation in ambiguous contexts, unless their standards are significantly influenced by impactful experiences (Zimmerman, 2000). In this regard, the demonstrated police-military sectoral differences suggest that bidirectional phase transitions may evoke both inhibitory self-sanctioning and proactive self-motivation. Furthermore, how

these mechanisms were manifested in hybrid warfare contexts through divergent inclinations towards either the continuation of existing approaches or the adoption of innovative strategies, respectively.

When interpreting these similarities and differences in decision-making among police and military commanders, there are two major clarification aspects. On the one hand, it is important to acknowledge that wars posing a threat to national security are infrequent occurrences and are rarely executed at higher levels of government (Heier & Kjølberg, 2020). Consequently, commanding officers within both the police and military encounter significant obstacles in accessing training, acquiring specialized knowledge, and cultivating effective decision-making processes to address the challenges presented during times of war. Thus, the difficulties in coordinating multiple resources in unfamiliar situations (Salas et al., 2017), where every outcome entails significant risk and irreversible consequences (Alison et al., 2018), may partly account for the observed differential group outcomes in the war and post-conflict phases. As exemplified by our analysis, the demonstrated decision-making similarities in the peace phase indicate how police and military commanders have previous experience from employing specific protocols designed for crisis response during peacetime. However, as the scenario shifted into war and post-conflict conditions, which were less familiar, notable differences in decision-making between the two entities emerged. On this note, it seems reasonable to assert that these disparities could potentially give rise to disagreements when crises extend beyond the scope of peacetime. This phenomenon becomes apparent through the differential group outcomes observed for the ways in which police and military commanders chose to organize subordinates into forces they considered feasible for various missions.

On the other hand, scholars argue that the difficulties of decision-making as a collaborative crisis response are most pronounced when threats occur below the threshold of war (Cullen & Reichborn-Kjennerud, 2017), which emphasizes the challenges faced by commanders in making effective decisions during a crisis' early stages and aftermath. Consequently, our findings concerning decision-making performance, which will be discussed in the next subsection, seem to elaborate on and extend this discussion. Our findings illustrate that both the police and military commanders demonstrated more favorable decision-making preferences at times of war compared to periods of peace and post-conflict. This describes the varying capacities of individuals in terms of anticipating threats, assessing the relevance of

their standards, and self-regulating effectively in the face of difficulties. We posit that our findings offer compelling evidence to substantiate the notion that events occurring below the threshold of war pose the most significant decision-making challenges to individuals in positions of authority. Accordingly, our research seems to address the asserted demand for improved insights into the psychological mechanisms that influence the decision-making processes of individuals responsible for collaborative crisis response (Jensen & Bogart, 2022).

Moreover, as posited by Bandura (1999), the observed variations between the police and military commanders underscore the distinct characteristics and challenges that may be associated with each phase of a crisis. These differences can be attributed predominantly to the triadic interplay of personal, behavioral, and situational factors. Specifically, how individual standards and ambiguity exert their respective influence throughout these interactions. Consequently, our results describe the importance of understanding how the contextual influence of threats and the self-regulatory capacities of commanding officers can be manifested in specific aspects of their decision-making when organizing subordinate units in the face of difficulties. For instance, the observed disparities between the police and military commanders signify that individuals in positions of authority may demonstrate a propensity for unilateral approaches during the initial stages of collaborative efforts. This implies that they may tend to pull in divergent directions, based on their past experience, which can have detrimental consequences, particularly in hybrid warfare scenarios where cohesive and unified efforts are of utmost importance (Yanakiev, 2018). On this note, our findings underscore the importance of recognizing how the functional significance of available assets was interpreted differently by police and military commanders, respectively. Moreover, we describe how these interpretations influenced the subsequent decision-making processes of commanding officers in terms of how they chose to organize their subordinates during periods of change.

On the commanders' guidance for execution of operations. In Paper 2, two additional factors central to collaborative crisis response, namely force posture and mission urgency (NATO, 2019b), were incorporated as variables to examine the effect of phase transitions on the decision-making of police and military commanders. The escalation of a crisis, previously recognized as being linked to increased resource commitment and effort over time (Cottam et al., 2022), was indeed found to result in higher levels of force posture and mission urgency in our analysis. Moreover, de-escalation conditions, previously associated with composed

behaviors and reduced use of force (Todak & James, 2018), were found to correspond to lower levels of force posture and mission urgency. These findings provide further indications of how the bidirectional transitions from peace to war induce decision-making disparities among commanding officers, encompassing variations in their intent, objectives, priorities, and expectations. Moreover, our results clearly illustrate how and why some approaches proved more psychologically appealing than others, considering the escalating tendencies of a crisis.

As suggested by Bandura (1999), under permissive circumstances, ample sources of efficacy-affirming information should be available, facilitating the refinement of the efforts necessary for efficient crisis management. Conversely, in non-permissive conditions such as war, the availability of efficacy sources diminishes, thereby motivating assertive actions aimed at offering a sense of immediate response or a perceived advantage in countering emerging threats, even if they involve higher risks or unconventional approaches. In light of our findings, it can be inferred that in the peace and post-conflict phases, when tensions were lower and events more familiar, decision-makers might have been driven by a sense of normalcy or stability. As a result, they may have adjusted their cognitive readiness in alignment with the declining threat level and heightened perception of control. Consequently, our results highlight the importance of finding a balance between excessive complacency and constant vigilance when it comes to addressing potential threats. This is particularly important for new and emerging security incidents that are not yet at the level of a full-scale war. For example, if commanders become too relaxed during a close protection mission, they may neglect security tasks or underestimate the capabilities of potential threats, which could increase the risk of unauthorized actions. Conversely, being overly aggressive might lead to an overbearing presence, causing tension and unnecessary confrontations.

While a lot of research has assessed how SCT predicts behavioral outcomes in schools and other formal environments (Schunk & DiBenedetto, 2021), our findings suggest that SCT is also applicable in more ambiguous contexts, especially when it comes to understanding the choices made by professionals regarding work-related tasks. The results from Papers 1 and 2 indicate that both police and military commanders interpreted the war condition as a situation in which success was attainable, despite setbacks and heightened risks, potentially leading to more offensive behaviors. In contrast, in the peace and post-conflict states, these beliefs were manifested differently through less persistent efforts. Our findings expand upon previous

studies (Houghton, 2015) by offering a more comprehensive analysis of the notion that individuals tend to endorse established beliefs or novel initiatives based on their perception of familiarity with a given situation. For instance, our analysis suggests that police commanders tend to view themselves as familiar with the post-conflict conditions, as indicated by their inclination to revert to pre-war decision-making strategies employed prior to the outbreak of war. This implies that they may have felt a sense of efficacy about the methods previously utilized and shouldered the belief that these approaches were sufficiently effective to manage the post-conflict situation. On the other hand, military commanders appear to have perceived themselves as less familiar with the post-conflict conditions, which seems to have stimulated their motivation to explore and implement novel approaches during this phase. This finding elaborates on the research of Schunk and Cox (1986), showing that situational feedback may serve as a source of efficacy information, motivating individuals to persist. However, as the situation unfolds, Schunk and Cox also suggest that the impact of this effect may vary, depending on the individuals' skills. In some cases, feedback may even convey negative efficacy information if individuals question the relevance of their previous experience.

Furthermore, our findings demonstrate the sensitivity of the force posture scale as the most effective social cognitive measure for identifying the impact of phase transitions on police and military commanders involved in managing hybrid warfare. This was followed by measures of force composition, mission urgency, and decision-making performance. Interestingly, our findings also suggest that when a crisis escalates and the possibility of all-out war becomes likely, decision-makers are more likely to make changes to their decision-making preferences. Hence, our results provide a plausible account of the potential of SCT to describe the conditions under which decision-making differences are likely to arise during security crises. Specifically, they suggest that the recognition of formal indicators of phase transitions, such as royal decrees declaring war, and the identification of informal triggers that may precipitate such transitions, such as unapproved actions by foreign nationals displaying evident hostile intentions, can be of significant value in the management of the collaborative crisis response. This, in turn, could facilitate implementing more adaptive police-military approaches to account for changes in the operational environment. Such approaches should aid the reassessment of threats, the clarification of roles and responsibilities, and the allocation of resources based on the evolving circumstances.

In sum, our results add nuanced perspectives to the understanding that increased efforts are associated with greater achievements, as proposed by Bandura (1997). Our findings underscore the importance of individuals' self-regulatory capacity as a significant predictor of decision-making differences in ambiguous working environments. Furthermore, they highlight how standards of adequacy can serve a dual function, with an inhibitive effect through self-sanctioning, and a proactive effect through self-motivation. To exemplify, consider commanders trained to adhere to the rule of law. Through self-sanctioning, the commanders may exercise control, and refrain from using excessive force. Despite the internal struggle and the pressures of the situation, they may choose to adhere to their personal and organizational standards and ensure that their decisions prioritize the overall success of the operation. Additionally, self-motivation may enable the commanders to take initiative and seek opportunities to inspire their teammates and persist in the face of difficulties. According to Bandura (1999), balancing self-sanctioning and self-motivation involves assessing the relevance of existing standards and using these interpretations as a guide for action, while also nurturing intrinsic motivation driven by a sense of purpose. We believe these self-referent processes provide a valuable framework for comprehending how professionals make decisions and engage in specific activities to achieve desired end-states. Understanding these mechanisms should play a crucial role in guiding police and military commanders to achieving feasible outcomes in police-military interactions. Consequently, the insights gained from our analysis could be instrumental in shaping training initiatives that equip commanders with the necessary skills to manage collaborative crisis responses successfully.

The predictors of decision-making performance

The third research question (RQ3) of our thesis focuses on the core determinators of performance, as described by Social Cognitive Theory (SCT). It posits that individuals who are considered professionals within a specific task domain are expected to outperform individuals with less experience in that same domain in terms of their performance achievements (Bandura, 1999, p. 187). Hence, it was hypothesized that the police commanders would exhibit superior crisis response proficiency during periods of peace, whereas the military commanders would demonstrate optimal performance in times of war. Despite our findings indicating that both entities exhibited the highest performance in

wartime, it is noteworthy that, contrary to our initial expectations and as reported in both Paper 1 and Paper 2, no statistically significant distinctions in decision-making performance between police and military commanders in general were observed. These findings contradict the anticipated interaction effects of phase transitions and occupational backgrounds. They also suggest that the standards necessary for effective performance in the context of hybrid warfare are developed on a similar basis for both police and military commanders. Moreover, the practical decision-making difficulties seemed to be most pronounced when threats appeared below the threshold of war.

Given the observed variations in decision-making preferences between the two entities concerning specific aspects such as urgency and force composition under specific crisis conditions, our initial results suggest that other social cognitive factors could also be important in predicting collaborative crisis response performance. Thus, consistent with SCT, we hypothesized that the performance of commanding officers could be better understood by examining the influence of their efficacy beliefs and persistence in the face of difficulties. Furthermore, given that real-world decisions pertaining to crisis response are typically made by teams (Bartone et al., 2010), our individual-level findings motivated us to focus on the factors that influence the decision-making performance of dyads comprised of police and military commanders. Consequently, in Paper 3, a path-analysis approach was employed to explore the interactions between personal, behavioral, and situational factors during the transition from peace to war, and their potential effects on performance during wartime.

The results reported in Paper 3 expanded upon the findings from Papers 1 and 2 by examining a set of social cognitive factors as predictors of the wartime performance of dyads, following the causal pathways described by Wood and Bandura (1989). As will be discussed, our path analysis revealed that a significant proportion of wartime performance could be predicted by a combination of past performance, efficacy beliefs, dyad composition, and persistence ($R^2 = .54$). The analysis of all cases examined indicated that past performance in peacetime consistently emerged as the most influential factor for wartime performance. Persistence and dyad composition also demonstrated significant effects, albeit to a lesser extent. It is noteworthy that no statistically significant effects were observed for collective self-efficacy in relation to performance, which is an interesting finding. Furthermore, the path analysis elaborated the individual-level findings of Papers 1 and 2 by demonstrating improved performance during wartime at the dyad level.

Past performance. Our findings regarding the influence of past performance align with the cross-domain hypothesis proposed by Bandura (1997). It posits that self-referent thoughts acquired and developed in one area of life can influence and enhance performance in other domains. Although our path analysis supports research describing how past performance is a useful predictor of future performance (Sitzmann & Yeo, 2013), it also emphasizes the cautionary notes put forth by Bandura (1999) regarding the potential negative consequences of overreliance on past accomplishments for tasks that require deliberate and thoughtful action (p. 171). In the context of security crises, this implies that commanders may become complacent and fail to adapt to escalating situations because they initially experience success. However, this complacency can be risky as it can lead to a decline in performance when the situation turns into a full-blown war. Therefore, it seems crucial for commanders to actively seek out any discrepancies or inconsistencies and to critically evaluate the significance of their achievements during peacetime. By doing so, commanders should be able to determine whether strategies employed in peacetime remain relevant in wartime.

While we acknowledge the presence of disparities between peacetime and wartime domains, it is pivotal to recognize that there are indeed multiple areas of similarity and shared principles in the realm of crisis management within these two domains. The resemblances in the work contexts and tasks of these domains necessitate comparable approaches, strategies, and decision-making processes. Notably, key aspects such as command and control, risk assessment, resource management, and communication exemplify these similarities. Hence, we assert the validity of our comparisons between peacetime and wartime performance.

Persistence. Our analysis yielded a contradictory finding in relation to existing research, which commonly suggests that greater persistence is associated with higher performance (Lent & Brown, 2019; Schunk, 2012). However, our study observed a different pattern, indicating that lower levels of persistence during wartime were actually predictive of higher performance. This discrepancy highlights how decision-making challenges in unfamiliar and highly ambiguous settings are common and can impede collaborative efforts. These challenges may arise due to the limitations of existing mechanisms that fail to provide appropriate responses in new and complex situations (Marchau et al., 2019). As a result, our findings appear to offer empirical support to scholars who argue that prudent decision-making becomes crucial in times of war (Gray, 2010). According to Gray (2010), prudence in war entails carefully weighing the potential strategic risks, costs, and benefits associated with

different courses of action. This includes considering various factors such as intelligence, situational awareness, potential risks, available resources, and the potential consequences associated with the objectives they seek to achieve. Hence, our findings serve to underscore the importance of individuals who are responsible for collaborative crisis responses being in possession of the requisite skills and knowledge to enable them to convert tactical actions into strategic effects, despite the inherent ambiguities of hybrid warfare. This is consistent with Bandura's (1986) explanation that decisions are not solely influenced by individuals' expectations of immediate consequences, but also by their assessments of future outcomes if they adhere to their current preferences. Consequently, the successful dyads appear to have anticipated that expending deliberate effort would lead to favorable results, thereby fostering a propensity for prudence, particularly in times of war. In this regard, our findings can be interpreted as emphasizing the role of forethought, as described by SCT.

The identification of persistence as a significant predictor of performance in our study is a valuable contribution, particularly because prior research of the collaborative crisis response at higher levels of government has largely overlooked the importance of psychological variables (Dyson & t'Hart, 2013). Our finding also holds significance because persistence has been recognized as a potential factor in promoting behavioral flexibility and enhancing performance, even in adverse working environments (Ahsan et al., 2021; Hommel, 2015). According to these scholars, persistence enables individuals to stay focused on their goals, maintain resilience, engage in creative problem-solving, and adapt to changing circumstances. On this note, our findings emphasize the importance of also recognizing the negative effects persistence may have in warfare. Specifically, we highlight how persistence can contribute to the escalation of crises, whereby individuals persistently mobilize resources and expend efforts towards ineffective courses of action. This persistence-driven decision-making can result in the waste of valuable resources and enhanced risks for the individuals involved. This finding is important as it may represent a step towards changing the standards within the police and military regarding their approach to collaborative crisis response.

Dyad composition. The inclusion of both police and military commanders in the dyads studied allowed our analysis to address the question of whether cross-sectoral membership influenced the performance of dyads. Indeed, the composition of a dyad should be a critical factor that can either inhibit or contribute to effective decision-making (Bandura, 1993). Intuitively, a diverse dyad composition, with individuals possessing a range of expertise and

perspectives, could foster more robust and comprehensive decision-making outcomes. Conversely, a homogeneous dyad composition would hinder the exploration of alternative options and impede the overall effectiveness of the decision-making process. However, scholars describe how heterogeneity may indeed lead to increased task conflict, lower social integration and negative performance outcomes (Mannix & Neale, 2005). To manage these liabilities, they recommend focusing on the benefits of bridging the contrasting backgrounds of team members through shared standards and values. Consequently, scholars assert that individuals in positions of authority need to recognize how the expression of diverse expertise can influence their organizations (Stahl & Maznevski, 2021).

In our analysis, the observed indirect effect of dyad composition on wartime performance through the mediation of persistence suggests that all the dyads possessed the necessary competencies. This finding suggests that the composition of dyads, whether they consisted of individuals with military backgrounds, extensive police training, or a combination of both, provided all types of dyads with a solid foundation of crisis management skills and decision-making abilities. However, it also indicates variations in their ability to gather pertinent information and provide effective instructions on the basis of ambiguity. On this note, our analysis suggests that the dyads demonstrating lower levels of persistence stood out in terms of translating ambiguous feedback into efficient actions during wartime. On the other hand, the positive correlation observed between dyad composition and wartime performance implies that when dyad composition went up, performance also went up. This means that the all-military dyads displayed the highest level of performance in wartime. This conclusion is drawn from the fact that the all-military dyad was ranked third in our analysis. Consequently, the correlation can be interpreted as supportive of the notion that there are sectoral differences in decision-making performance. Nevertheless, when considered in conjunction with the results from Papers 1 and 2, as well as the lack of a statistically significant direct effect of dyad composition on wartime performance, this suggestion must be deemed to be weak.

Collective self-efficacy. Our lessons concerning self-efficacy were more mixed than the findings regarding past performance, persistence, and dyad composition. Although the commanders' efficacy beliefs remained consistent from the beginning to the end of the simulation, the relationship between collective self-efficacy and their overall performance levels during the simulation did not appear to be significant. Similarly, efficacy beliefs did not

seem to exert a substantial influence on persistence, which contradicts research showing that strong efficacy beliefs are a reliable predictor of greater persistence (Schunk & DiBenedetto, 2021). Our inconclusive results regarding the relationship between performance and efficacy beliefs align with commonly observed findings in naturalistic settings (Bandura, 1997), where issues of feedback ambiguity (Gibson, 1999), and challenges in assessing efficacy sources (Stajkovic et al., 2009), arise. As a result, the direction of relationships between efficacy beliefs, activity choices, and real-world functioning remains a topic of ongoing debate (Schunk & DiBenedetto, 2020).

In light of the present findings, it becomes apparent that strong efficacy beliefs, combined with high levels of persistence, may present challenges during a collaborative crisis response. This observation highlights the difficulties that may arise when individuals possess both high efficacy beliefs and high persistence, particularly in the context of wartime scenarios. Furthermore, this may hinder the ability to adapt to new and unfamiliar circumstances, potentially impeding effective decision-making. It underscores the need for a nuanced understanding of the dynamics between efficacy beliefs, persistence, and the practical realities of wartime situations. Consequently, our results suggest that commanders should pay more attention to domain-specific skills than their perceived ability to accomplish tasks, as such perceptions are less likely to accurately predict their actual performance in wartime.

In sum, the results obtained from the present thesis' analyses indicate a significant improvement in performance when transitioning from peace to war. Our results not only provide further insights into the predictions of SCT (Schunk & Usher, 2019), but also contribute to the understanding that decision-making processes differ in security crises, depending on the phase in which threats emerge (Suedfeld & Tetlock, 1977). Moreover, they advance the notion that hybrid attacks occurring below the threshold of war present the most formidable challenges in terms of decision-making and resolution (Cullen & Reichborn-Kjennerud, 2017). Consequently, this should serve as a reminder that individuals tend to make suboptimal decisions during the initial stages of a crisis (Suedfeld & Bluck, 1988) and underscores why scholars assert that those in charge of the crisis response need to seek diverse opinions and consider disconfirming evidence when applying established methods in unfamiliar settings (Barton et al., 2015; Klein, 2011). It is indeed recommended that the education of government officials should incorporate a deeper understanding of the

psychological effects of hybrid warfare (Kowalski & Prescott, 2019). Therefore, we firmly believe that the insights derived from our analyses can make a valuable contribution towards this endeavor.

Methodological considerations

The present thesis demonstrates commendable strengths, including the rigorous utilization of statistical analyses to investigate original research within a field that lacks theory-driven empirical studies. Moreover, the replication of initial findings in subsequent studies and the inclusion of a distinctive participant group in the simulations contribute to its robustness. Additionally, the exploration of a highly significant topic related to security policies further enhances its value. Nevertheless, it is equally important to acknowledge the presence of noteworthy limitations within this thesis.

One such limitation is the utilization of a repeated measures design to emphasize ecological validity. On this note, it is important to acknowledge that our use of real-world dilemmas and contextual factors may have introduced confounding variables that could potentially influence the internal validity of the study. Moreover, the reliance on self-reported measures within the simulations introduces the possibility of respondent bias, potentially leading to measurement errors and reduced accuracy of the data obtained. However, in line with the perspectives of Babbie (2021, p. 477), we maintain that our chosen approach, together with the subsequent statistical tests, was justified, as it facilitated a thorough comprehension of our data and the social reality under investigation. Nevertheless, caution should be exercised when drawing inferences regarding causal relationships between variables in the present thesis.

Another limitation concerns our research design's specific focus on the national headquarters' strategic decision-making environment. Although we aimed to ensure that the simulations closely resembled the conditions in which the management of collaborative efforts occurred, this aspect could hamper the ability to generalize the findings to contexts involving more tactical and enactive tasks. For instance, in the present thesis, the decision tasks involved managing the actions of others and adapting to evolving crisis response situations. While this approach effectively assessed how commanding officers connected tactical actions to overarching strategic objectives, its applicability might be less relevant in

settings characterized by fewer options and a narrower range of conditions. It is essential to recognize this in order to appropriately interpret the findings and to avoid overgeneralization beyond the scope of our research design and hybrid warfare context.

One more general limitation pertains to the composition of the participant samples, which predominantly consisted of high-ranking male commanders. Consequently, the generalizability of the results to other groups or sectors may be limited. To enhance the applicability of our findings, it would be beneficial to include sectors with a higher representation of women, sectors characterized by lower stakes and reduced uncertainty (e.g. education), sectors operating in more stable environments (e.g. transport), and sectors where issues are primarily addressed at a tactical level (e.g. autonomously managed non-governmental organizations). However, it is important to recognize that security crises share similarities with other comprehensive endeavors whereby professionals collaborate under extraordinary circumstances. Hence, it is reasonable to assume that our results can be reasonably generalized to other groups engaged in crisis management, such as healthcare, and economic, fire, and rescue sectors.

Another prevalent limitation found in our samples is the potential presence of participants with experience spanning both the military and police domains. This concern arises from Norway's compulsory military service program and the frequent personnel exchanges between the Norwegian police and the military sector. Overlooking this organizational aspect may have affected the results, as individuals with combined sector experience could potentially differ from those with exclusive backgrounds in either the police or the military. This introduces the possibility of bias within the findings. However, it is crucial to emphasize that the focus of the present thesis was specifically on decision-making at the national headquarters level. It is noteworthy that none of the participants reported prior experience at higher levels of leadership beyond their current sector. As a result, previous involvement in lower echelons of either the police or the military was not considered a confounding variable that would have influenced the results.

In this regard, it can be contended that the samples exhibited considerable disparities in terms of rank. Yet the analyses do not attribute the outcomes solely to the participants' rank; they rather focus primarily on measuring the effects of domain-specific operational experience. This approach is justifiable as it aligns with the nature of decision-making that traverses multiple hierarchical levels, due to the comprehensive nature of staff work during crises (Thürmer et al., 2020). Within this context, our analyses remain consistent with

previous research of professional behavior (Ericsson et al., 2007), which advocates assessing task knowledge levels, rather than assuming competence based solely on seniority or rank. Nonetheless, it is essential to acknowledge that our participants were selected specifically on the basis of their background in either the police or the military. The current results therefore primarily reflect the perceived relevance of aspects related to their domain-specific roles as security providers and may not be readily generalizable to other cross-sectoral contexts.

Moreover, we acknowledge that the scale we developed to assess the subject matter expert (SME) ratings of decision-making performance in Papers 2 and 3 did not adhere to a conventional construction process. This limitation constrains the conclusions that can be drawn from our analysis. Of note is the absence of significant differential effects between police and military commanders. While the scale enabled commanders to adjust their decisions in ways that are pertinent to operational conduct, the lack of support for our hypothesized sector differences in decision-making performance suggests that the scale may have had insufficient granularity (e.g. limited to only three levels), or that our selection of task elements may have omitted crucial components (e.g. the information aspect). These potential factors were excluded due to our choice of statistical tests and study design. Based on these findings, we recommend that future studies retain the current decision elements, but consider constructing a performance scale in accordance with validated psychological scale concepts. Similarly, it is important to note that the scale employed to measure the persistence variable was developed without a large-scale validation study, although “effort expenditure” and “resource mobilization” are well-established indicators of persistent intent in SCT (Bandura, 1986).

It is important to acknowledge that while Paper 1 revealed significant differences in decision preferences, the corresponding effect sizes (odds ratios) were mostly small to medium. This suggests that caution should be exercised in over-interpreting the practical significance of the research outcomes. Regarding the use of multinomial logistic regression, which was necessary for calculating the likelihood estimates of the participants’ activity choices, there is a relevant limitation associated with our adoption of a repeated measures design. It introduces a violation of the assumption of independence of irrelevant alternatives, which posits that the likelihood of choosing one option over another should not depend on the presence or absence of other irrelevant alternatives (Long & Freese, 2006). However, this assumption is frequently violated in regression models (Kruskal, 1988), and in the context of decision-making by police and military commanders concerning collaborative crisis response,

expecting independence seems impractical. The availability of multiple courses of action in such scenarios is likely to influence the decisions of commanding officers, such as utilizing police forces versus military forces, incorporating interagency assets, or rejecting tasks altogether. Faced with challenges and significant consequences, commanders may find that interagency forces a favorable option, and the existence of this option would clearly impact the selection among the remaining alternatives. Scholars indeed argue that even if the assumption is violated, it may not have practical implications (Jones-White et al., 2010). To this end, our aim was to employ options that reflected realistic alternatives in crisis response contexts, rather than imposing restrictions that were unrelated to our hypotheses. However, it is important to exercise caution in interpreting the results.

The limitations of Paper 2 primarily revolve around the strict adherence to several assumptions required to obtain unbiased results from the mixed ANOVA test. One limitation pertains to the significant outcome of Mauchly's test of sphericity for two variables (mission urgency and mission urgency-performance). To address this, the Huynh-Feldt correction was applied to yield valid F-values and mitigate the risk of Type II errors (Abdi, 2010). Another limitation arises from the significant result of Levene's test, which assesses the equality of variances in one of the simulation conditions (the post-conflict phase). Consequently, we conducted a robust ANOVA test (Field & Wilcox, 2017), which supported the initial finding. It is important to note that although the results highlight the associations between occupational background and phase transitions, there are several social cognitive factors that remain unaccounted for, particularly those related to decision-making performance. All of these assumptions and corrections should be taken into consideration when interpreting the practical significance of the tests conducted in Paper 2.

The limitations of Paper 3 primarily revolve around the adequacy of the sample size for conducting path analysis. According to Kline (2023), a minimum of 10 cases per parameter is recommended, with 20 cases preferred if possible. While this criterion was met in the present thesis, there are still concerns that the analysis may lead to inaccurate conclusions, for various reasons. For instance, despite a substantial proportion of the variance being explained by our model ($R^2 = .54$), it does signify the existence of additional factors contributing to decision-making performance in wartime that were not accounted for in the current path model. The lack of a significant impact of collective self-efficacy on wartime performance, for instance, raises questions about the validity of our efficacy measure and suggests that the sources of efficacy during wartime may differ from our initial expectations

when developing the collective self-efficacy measure. It also implies that we should have incorporated stronger stimuli and more challenging tasks in the simulation. However, prior research indicates that the presence of ambiguity complicates the practical difficulties of accurately estimating efficacy (van der Bijl & Shortridge-Baggett, 2000) and studies have demonstrated weak or negative relationships between collective self-efficacy and performance in dynamic contexts (Kellet & Humphrey, 2000). This underscores why scholars emphasize the importance of examining social cognitive processes beyond formal contexts (Schunk & Usher, 2019) and highlights the need for the development of more precise measurements of collective self-efficacy among professionals (Gully et al., 2002).

Additionally, it is imperative to acknowledge that our research was conducted within the distinct context of Norway, with a specific and deliberate emphasis on the police and military sectors. The presence of civilian oversight, well-defined roles and responsibilities, and adherence to professional standards, which are inherent characteristics of law enforcement and armed forces in Western nations (Weiss, 2011), undoubtedly exerts influence on the observed decision-making processes and findings in our studies. Hence, it is of utmost importance to exercise caution when endeavoring to generalize the findings to non-Western countries, which often face constraints in terms of crisis management resources, or to other contextual settings.

Moreover, the simulated crisis response scenarios used in the studies provide a valuable approach to examining decision-making processes in complex and time-sensitive environments. Although simulators are an important tool in the training and education of decision-makers with a view to improving performance (Saus et al., 2012), they also have inherent limitations. Of necessity, the simulations simplify the complex realities of real-world crisis situations (Dahlstrom et al., 2009) and the extent to which our findings can be generalized to actual decision-making in crisis response contexts should be considered with caution. While efforts were made to enhance the ecological validity of the simulations, there might still be discrepancies between simulated decision-making and decision-making in real-world scenarios. Factors such as time pressure, stress, and external influences may have different effects on decision-making in actual crisis situations, compared to the simulated environment (Magnusson, 2002).

One final limitation of our research pertains to the challenge of accessing police and military commanders who hold the necessary decision-making authority, in order to gather accurate and comprehensive data to address the research questions outlined in our thesis.

These individuals may impose strict operational considerations or legal restrictions that limit the level of trust and interaction researchers might be able to establish with the group members. For instance, entry into headquarters environments often entails rigorous security checks and involves classified practices. Feeney (2006) describes how research of such close relations might encounter resistance, suspicion, or outright rejection from the participants, which could impede the data collection process. However, in the present thesis, we maintain that our designated points of contact at the Norwegian joint headquarters and national police directorate possessed the necessary influence and authority among the individuals studied and consequently served as intermediaries, facilitating trust and access. For instance, our utilization of multiple datasets and diverse statistical methods probably contributed to thorough comprehension of the research topic. Furthermore, engaging independent subject matter experts to ensure the precision and reliability of the collected data served to bolster the credibility of our findings. We are also confident that the peer review process and external audits of all our papers played a significant role in confirming the rigor of our analyses.

Implications for theory

While the present thesis does not significantly challenge Bandura's Social Cognitive Theory (SCT), it provides valuable insights that support the predictive value of SCT in dynamic and ambiguous contexts. Moreover, our findings emphasize the importance of SCT in understanding how individuals in positions of authority engage in decision-making in efforts requiring them to collaborate, share information, and make progress over time through the actions of subordinates. Additionally, the current findings shed light on some limitations of efficacy beliefs. While self-efficacy is generally considered influential in determining behavior (Stajkovic & Luthans, 1998), our research highlights that its impact may be small in specific tasks or situations.

Furthermore, the current research emphasizes the predictive value of persistence. SCT explains how individuals exhibiting persistent behavior are more likely to succeed in the face of difficulties (Schunk & DiBenedetto, 2021). However, our findings add nuance to this notion, highlighting the importance of striking a balance between thoughtless persistence and exercising prudence. Our results suggest that individuals' ability to persist prudently, despite challenges and setbacks, plays a crucial role in achieving successful outcomes in a

collaborative crisis response. We believe these aspects of our research underscore the need for a nuanced understanding of SCT and its application, in order to understand the decision-making of individuals in positions at higher levels of government.

Implications for practice

The results of this thesis have underscored the significance of social cognitive factors, such as phase transitions, occupational background, domain-specific skills, group composition, persistence, and efficacy beliefs, as potential decision-making determinants. We believe that these factors should be considered in crisis response planning for security incidents that involve threats crossing the functional boundaries between the police and the military. In light of the substantial contributions of occupational background and past experience, it is advisable for leadership education and collaborative crisis response exercises, within both the police and the military sectors, to incorporate comprehensive hybrid warfare scenarios. These scenarios should encompass the management of transboundary threats that extend beyond the sectoral responsibilities of the security providers involved.

Importantly, if crises escalate and evolve into actual warfare, it is imperative to consider this as a viable condition warranting legislative provisions to promote police-military cooperation. These provisions would ensure the efficient utilization of crisis response resources to enhance the protection of critical infrastructure and ensure public safety.

Another implication derived from our findings is that addressing hybrid warfare effectively requires a thorough understanding of how the police and military's standards of adequacy influence their decision preferences. Leadership development programs therefore have a responsibility to educate commanders who can navigate the ambiguous environment posed by new and emerging threats. Such programs could enable commanders to assess the impact of events and the extent to which they challenge the decision-making frameworks of modern societies. Although the Norwegian police and military seem to be well aware of and prepared for integrating collaborative approaches into their crisis response systems (Regjeringen, 2018; Røksund et al., 2013; Storberget et al., 2023; Tamnes, 2015), it is important to note that enabling efficient governmental decision-making involves more than just mutual intentions (Høiback, 2021). While current crisis response frameworks aim for

shared situational awareness (Winge, 2021), they not only reflect the extent to which a collaborative crisis response in hybrid warfare settings relies on sectoral interoperability (Yanakiev, 2018), but also highlight the increasing importance of considering how the ambiguities of new and emerging security threats influence the applicability of well-established methods and techniques (Cullen & Reichborn-Kjennerud, 2017).

Moreover, our findings suggest that the police and military should strive to develop shared standards that they actively seek to employ in hybrid warfare contexts. Additionally, as the police and military share responsibilities in these settings, there are probably multiple and equally effective approaches that can contribute to improving the interoperability between these entities. By disseminating research results, it is possible to shed light on situations where certain actors assume a broader range of tasks, while others receive less, leading to suboptimal performance. For instance, in some situations in Norway, it remains unclear whether the police or the military should assume leadership (Fimreite, 2014). Therefore, our results suggesting decision-making differences between the two entities, as well as between peacetime and wartime, can help mitigate these shortcomings. Furthermore, understanding these differences can serve as a vital component to streamline the internal and external communications of police and military commanders during crises.

Furthermore, our results highlight the growing concerns regarding the inherent vulnerabilities of open societies and demonstrate the importance of countries targeted by hybrid warfare for the development of crisis response systems that effectively utilize both military and non-military resources (Crowther, 2021). While training and exercises play a significant role in preparing to counter hybrid warfare, there is still a need to educate leaders about sectoral differences in decision-making and how the transition from peace to war can influence the operational preferences of police and military commanders. As suggested by our findings, the initial step towards enabling improved cross-sector collaboration, including a united effort in countering hybrid warfare, could be to develop the capability to address events below the level of full-scale crises, thereby overcoming resistance to changing the interface between security providers (Pope, 2018).

In sum, the present thesis demonstrates the practical application of SCT through three interrelated papers that delve into the decision-making processes of police and military commanders within the domain of hybrid warfare. Our analyses have demonstrated how SCT serves as a pertinent framework for analyzing decision-making disparities that arise when

professionals from contrasting, yet equally relevant, backgrounds collaborate in security crises, where each course of action entails significant ramifications. Indeed, this elaborates on the assertions of Schunk and DiBenedetto (2021), emphasizing the need for future advancements in SCT to encompass crisis scenarios, and the role of organizational culture, as well as virtual and field conditions. In line with this perspective, the significance of our findings regarding the diverse approaches and contributions of police and military commanders to the decision-making processes for collaborative efforts becomes apparent.

Future research

Future research could focus on the decision-making differences observed within the police and military sectors, beyond the context of hybrid warfare. Conducting such investigations at the highest levels of leadership could provide further insights into the diverse approaches favored when implementing policies, potentially leading to a deeper understanding of how decision-makers within the political sphere are motivated to either adhere to established standards, or explore novel approaches in response to the perceived demands of the situation.

Additionally, research could delve into examining the decision-making ramifications of transitioning into a phase where NATO reinforcements are introduced to a conflict scenario. This would entail a shift from national homeland defense to a collective defense situation, as stipulated in Article 5 of the North Atlantic Treaty. On this note, research examining the social cognitive processes inherent in decision-making within international command teams could hold the potential to illuminate the mechanisms describing which information is shared, processed, and integrated within such teams.

Moreover, research could further explore the influence of persistence and group composition on predicting performance at higher levels of government. Additionally, qualitative studies that focus on the technological tools and decision-making support systems that individuals in positions of authority find beneficial for overseeing operations might be crucial to comprehending their cognitive processes and decision-making outcomes in collaborative crisis response. In this context, conducting studies involving command teams comprising three or more members is recommended, to enhance our understanding of group dynamics and decision-making within larger teams.

Conclusion

This thesis has presented empirical insights into the role of individuals in collaborative crisis response. Specifically, it has demonstrated the impact of occupational background and phase transitions on the decision-making of commanding officers entrusted with countering hybrid attacks that pose a threat to national security and public safety. Through the analyses of three thematically interconnected papers, several significant findings have emerged, contributing to our understanding of the intricate interplay between the cognitive processes and interactions of individuals within the context of security crises. Our findings shed light on how these dynamics are manifested in the interface between the commanders and their subordinates, providing valuable knowledge about their decision-making preferences and performance.

Firstly, the police and military commanders were found to be more likely to favor using forces from their respective sectors in general, indicating the influence of occupational background and domain-specific expertise on decision-making during crisis situations. Furthermore, it was observed that the commanders displayed a greater inclination towards interagency approaches during times of war, compared to periods of peace or post-conflict. This finding suggests that commanders recognize the need for collaboration and coordination across different sectors in order to effectively respond to crises characterized by escalation and unfamiliar threats.

Secondly, the study demonstrated that transitions from peace to war tend to result in more urgent and offensive actions. This finding highlights the dynamic nature of decision-making during security crises and the need for commanders to adapt their strategies and approaches accordingly. Importantly, no significant differences were observed in the decision-making performance of police and military commanders, respectively, suggesting that both sectors have similar crisis response capabilities and effectiveness.

Furthermore, the analysis revealed differences in how police and military commanders interpret the post-conflict phase. Police commanders tended to perceive hostilities as similar across situations and to adhere to established beliefs; while military commanders adopted a more flexible interpretation of events in de-escalation settings. This finding emphasizes the importance of understanding the perspectives and approaches of different sectors in order to achieve effective cross-sectoral crisis response collaboration.

Finally, the analysis indicated that dyad composition and past peacetime performance, as well as persistence, predicted superior wartime performance. This finding underscores the significance of team dynamics and individual characteristics for decision-making during security crises. Lower persistence levels were identified as an important factor mediating higher performance in wartime, emphasizing the need for deliberate actions and prudence in crisis situations. Interestingly, collective self-efficacy did not appear to play a significant role in decision-making during wartime, suggesting that individual characteristics may have a stronger impact on performance.

While our findings provide valuable insights into the decision-making processes of police and military commanders during security crises, it is important to acknowledge the inherent limitations in the research design, sample composition, measurement scales, and simulation methodology. These limitations should be recognized and considered in future research in order to build upon these findings and further advance our understanding of decision-making in crisis response contexts.

Moving forward, it is recommended that future studies explore whether other types of crises necessitate the same degree of collaboration as security crises, and whether the effects of a crisis' escalatory tendencies can be applied to other cross-sectoral interfaces. Conducting wider collaborative crisis response studies involving threats that transcend functional boundaries between governmental sectors is also advised. By expanding the scope of research, we can gain a more comprehensive understanding of crisis response decision-making across different sectors and settings.

In conclusion, this thesis highlights the importance of developing a deeper comprehension of the decision-making trends exhibited by police and military commanders, particularly in the context of a collaborative crisis response. It emphasizes the need to identify overarching indicators that can predict performance at higher levels of government, with the aim of converting tactical actions into strategic effects. However, the findings also indicate shortcomings in this understanding, such as varying degrees of proficiency in capitalizing on opportunities, and differences in activity choices when confronted with ambiguity and change.

To address these shortcomings, it is crucial for police and military leaders to acquaint themselves with the methods and standards required to counter hybrid warfare. They should seek to better comprehend each other's roles and capabilities in such contexts, facilitating a

more comprehensive understanding of how police and military methods can be integrated in a collaborative crisis response. To accomplish this objective, an expansion of cross-sectoral training and exercises conducted by the police and the military is proposed. These training sessions should include a comprehensive range of threats related to hybrid warfare, incorporating realistic scenarios that require collaboration between the police and military forces. In certain cases, higher-level government officials should provide oversight and guidance for these exercises, ensuring that they are aligned with overarching political objectives.

By addressing these recommendations, we can enhance collaborative crisis response decision-making processes and ultimately improve our ability to effectively respond to security crises. This will contribute to the overall resilience and security of our societies, ensuring the safety and well-being of our citizens.

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Notes

[i] The term “Western countries” refers to nations that are typically located in North America, Western Europe, and other regions where Western cultural, political, and economic influences are prevalent. These countries often share similar democratic systems, values, and institutions (McNeill, 1997).

[ii] Force composition refers to the allocation of personnel, equipment, and resources by commanders with the intention of creating a cohesive unit capable of effectively executing missions and attaining operational objectives.

[iii] Force posture concerned the commanders’ intent regarding the use of force in operations. It was not a limitation, but provided subordinate units with an understanding of the expected readiness of force elements, the types of methods that were suitable, and how much risk the commander accepted. For example, defensive postures indicated that the goal was to de-escalate the situation. Conversely, offensive postures meant that the force could take the initiative and that escalation was acceptable.

[iv] Mission urgency involved the commanders’ intent regarding the expected time from when a subordinate unit received orders to conduct a given mission to the time that movement was initiated. It included the time for planning, order briefings, and necessary preparations to familiarize capabilities, connect commands, and integrate combat support.

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Exploring Why Police and Military Commanders Do What They Do: An Empirical Analysis of Decision-Making in Hybrid Warfare

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Abstract

In this study, a total of 102 high-ranking commanders from a military and police background were included in a simulation involving hybrid attacks on Norway. The aim was to explore the commanders' decision-making in the context of hybrid warfare and changing threats. Data were collected in a simulated national headquarters and analyzed by a multinominal logistic regression method using a scenario that transformed from peacetime into war and returned to peace. The results demonstrated significant differences in the commanders' preferences for unilateral or interagency forces depending on whether decisions were made in peacetime, war or the post-conflict phase. The results also showed how the commanders' level of operational experience was associated with an increased preference for interagency forces. The current findings are new empirical insights into a thus far neglected aspect of decision-making research and have implications for improving police-military interoperability in major security crises.

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Norway, hybrid warfare, homeland defense, decision-making, phase transitions, police-military interoperability, social cognitive theory

Ever since the turn of the 21st century, scholars have focused on the ways in which hybrid warfare blurs the lines between internal and external security (Angstrom & Ledberg, 2021). This obscures people's binary ideas about war and peace (Wither, 2016) and converge the gap between state security and public safety (Kalkman, 2020). Consequently, the police and military are becoming more alike (Collins & Hall, 2022; Wilén & Strömbom, 2022), making it more difficult for police and military commanders to identify the strategic context within which they are operating (Caliskan & Liégeois, 2021). The hybrid warfare conducted by Hezbollah in Israel (Najžer, 2020), Iran in Syria (Piotrowski, 2017), ISIL in Iraq (Feakin, 2014), and Russia in Crimea (Erol, 2015) exemplifies the difficulties involved in understanding the numerous interpretations of hybrid attacks (Malerud et al., 2021). The precise form that future hybrid attacks will take is difficult to predict, but it is certain that they will traverse police-military boundaries, requiring decision-makers to cooperate and accommodate sectoral differences (Baumann, 2012, p. 43). The subsequent demand for more flexible frameworks has led scholars to question whether existing security concepts are compatible with the challenges posed by hybrid warfare (Tóth, 2018).

The above illustrates a larger trend: homeland defense against hybrid attacks is too complex to be divided into strict categories and there is consequently a need to develop knowledge about police-military interoperability in hybrid warfare contexts (Birkemo, 2013). Many scholars have discussed the dynamics that shape the dividing lines between the roles and responsibilities of the police and military in modern globalized societies (Delaforce, 2019; Turner & Fox, 2019; Weiss, 2011). In the Norwegian context, efforts have been made to improve police-military interoperability (Røksundutvalget, 2016) by facilitating cooperation and enlisting shared responsibilities between the police and military in case of hybrid attacks (Tamnes, 2015). However, very little empirical research has been conducted into the extent to which new and emerging police-military interfaces impact decision-making (Shortland et al., 2019, p. 47).

On this basis, this study aims to explore how operational level commanders from a police or military background engage in decision-making in the context of hybrid warfare by asking the following questions: (a) To what extent does the police and military's shared responsibility to counter hybrid attacks impact decision-making in a Norwegian context? (b) To what extent do changing threats that traverse sectoral boundaries impact the decision-making of police and military commanders? The study's general expectation was that the police and military commanders would demonstrate differential decision-making because their understanding would be largely based on previous work-related experiences. Specifically, they would have different

interpretations about who has the necessary capabilities, and therefore make different decisions about the security forces that would conduct operations. Furthermore, as hybrid attacks have numerous social and contextual features (i.e., actions will not only have an immediate impact on the ground reaction forces but also on others who partake in the overarching effort) the analysis explored the commanders' social cognitive foundations for decision-making in collaborative crisis management.

Starting with an original dataset, the study's exploratory approach[1] not only analyzed the independent variables of occupational background and operational experience but also how the transition between peace, war and a post-conflict phase impacted the commanders' decision preferences regarding the dependent variable, force composition. The analysis revealed new empirical findings about how the actions of police and military commanders can diverge and produce decision-making differences that impact police-military interoperability in collaborative crisis management efforts. A more detailed discussion of the specific hypotheses is presented after a brief description of the analysis' rationale.

The next section presents a description of the Norwegian decision environment in relation to recurring debates from recent security crises, followed by a presentation of the theoretical framework and hypotheses. Section "Method" presents the scenario, research design and method. Section "Statistics" deals with statistics and variable specifics. Section "Results" describes the results of the analysis with emphasis on the degrees to which the data supported the hypotheses. Section "Discussion" discusses the significant findings and their implications. The last section concludes by providing a tentative statement about the differences between police and military decision-making in hybrid attacks.

Recurring Debates

In the wake of the growing interest in hybrid warfare and governmental decision-making, two core debates have emerged. The first debate was triggered by rising concerns about the ways in which military forces are involved in police matters in security crises (Kalkman, 2019; Loader, 2017). Nevertheless, several studies have explored police-military cooperation in international peace operations (Horne et al., 2022), but there is a remarkable lack of empirical evidence about police-military sector differences in national security crises (Dahlberg & Dalgaard-Nielsen, 2020). As such, scholars argue that an improved understanding of sectoral differences is crucial for improving police-military interoperability (Penney et al., 2022).

In this context, reporting from recent security crises indicate inadequate interactions between governmental sectors in the United Kingdom (Murphy, 2006), Norway (Gjørv et al., 2012), Israel (Matthews, 2011), and the United States (Hoffman et al., 2015). In all these cases, the reports' conclusions underline how the crisis management efforts were flawed because the importance of interagency collaboration was underestimated. Overall, these examples support the claim that the interface between the police and military in modern societies is unclear (Auglend, 2016; Bossong & Rhinard, 2021), and why it is increasingly important to understand the extent to

which the police and military have become more enmeshed in the security crises of modern societies (Kraska, 2007).

The second core debate is how decision-making research has increasingly focused on uncertain decision-making environments, team interactions and the previous experience of professionals (Montgomery et al., 2004; Mosier et al., 2018). Furthermore, a number of studies describe how security crises create unique cognitive demands for decision-makers (Bartone, 2010) and highlight the importance of understanding the mechanisms that enable cognitive readiness and adaptability in rapidly changing threat conditions (Grier, 2012). In this context, scholars have demonstrated how uncertainty invalidates people's ability to reach meaningful conclusions about events (Hardaker et al., 2015) and causes decision-makers to collect more information, make assumptions, weigh the pros and cons, forestall decisions or ignore undesirable information (Lipshitz & Strauss, 1997). In extraordinary events such as hybrid attacks, research also describes how decision-making is difficult if multiple sectors are involved since their existing mechanisms will not provide appropriate responses to unexpected actions (Marchau et al., 2019, p. 30).

From this perspective, the role of cognitive processes has become increasingly important to explain decision-making (Brust-Renck et al., 2021), but the lack of empirical research on hybrid warfare contexts is evident (Giegerich, 2016; Weissmann et al., 2021). Even so, findings from similar domains involving uncertainty and multiple actors have demonstrated significant disparities in how professionals make decisions.

The main drivers of the decision preferences of professionals have been identified as disputes about task definitions, code of conduct, responsibility and risks (Keddell, 2014). Research has shown how previous experience determine which factors are considered, how responsibilities are recognized, and the resultant dilemmas stemming from different opinions and uncertainty (DeLong-Hamilton et al., 2016). Ashton (2004) also shows how previous experience impacted the decision variability of professionals differently. Molina-Mula & Gallo-Estrada (2020) found similar trends when they compared the decisions of less experienced decision-makers with those who had more experience. However, Walsh et al. (2012) found mixed results regarding the influence of previous experience when investigating the reporting practices of experienced decision-makers in cross-sectoral scenarios. As such, it is evident that decision preferences not only depend on verifiable actions and contextual determinants but also on the decision-maker's anticipatory and affective reactions (Graham et al., 2015; Sniazhko, 2019).

Social Cognitive Theory as a Framework for Explaining the Decision-Making of Professionals

The overarching theme of this study was that decision-making in an operational headquarters entails a social context in which commanders vicariously oversee a series of interrelated actions conducted by others. Thus, the theoretical framework of

this study was Bandura's (2001) Social Cognitive Theory (SCT). It is based on an ontologically irreducible individual existing self and a plurality of emergent interactive agentic processes that enable people to be intentional doers, despite uncertainty (Bandura, 1991). The belief systems formed by SCT's cognitive dynamics explain how decision-making relies on people's ability to monitor and analyze actions, reflect on consequences, and self-regulate behavior toward desirable pursuits and away from undesirable consequences (Stajkovic & Sergent, 2019).

SCT has several associated theories describing how people make decisions involving uncertainty, such as the concepts of heuristics, biases and framing effects (Kahneman & Tversky, 2013), as well as recognition-primed decision-making (Klein, 2017). These models are similar to SCT in the sense that all of them contend the importance of mentally simulating outcomes, but are primarily descriptive (Brust-Renck et al., 2021). In contrast, SCT uses process level explanations to describe a decision's personal and social foundations. As such, SCT can be used to explain decision-making differences and how people's preferences can be adjusted if ongoing events are interpreted as justifying "new" solutions (Bandura, 1999, p. 155).

There were four reasons why SCT was believed to be useful for explaining the decision preferences of the police and military commanders in this study. First, SCT acknowledges that commanders operate in the environment through self-referent thinking (Bandura, 2012, p. 24) and, unlike economic decision models, SCT can explain the "least-worst" decisions inherent in security crises (Shortland et al., 2020) through the cognitive dynamics of self-monitoring, self-regulation and self-evaluation. Second, SCT describes how these self-referent processes cause selective attention that determines what information is extracted and translated into motivated actions (Bandura, 1999, p. 171). Third, SCT explains that even if people have the knowledge and skills to succeed, cherished methods will be discarded if they doubt their ability to realize desirable outcomes (Stajkovic & Sergent, 2019). Fourth and most importantly, SCT describes why the commanders' decision preferences are not only a product of pure cognition but just as much an expression of how contextual influences and emotions are activated according to preexisting beliefs derived from previous experience (Bandura, 1999, p. 190). As such, SCT explains why people from contrasting backgrounds may prefer different courses of action in one and the same situation.

In sum, the cognitive appraisals conceptualized by SCT describe how the thoughts of police and military commanders will be shaped by the norms of their originating sector. In turn, their actions will reflect their anticipatory estimations of what is required to achieve the desired outcomes through the lens of previous experience. Thus, this study expected police commanders to demonstrate a predisposition toward choosing law enforcement units, and military commanders would be predisposed toward choosing military units (Hypothesis 1 (H1)).

Furthermore, the study expected that the relevance of the commanders' previous experience would diminish as the scenario transformed into war. Consequently, they would adapt to change by becoming more exploratory. As interagency efforts have

been encouraged, but not yet fully recognized in current security concepts (Yanakiev, 2018), this study expected that the transition from peace to war would make the commanders of both sectors demonstrate an increased preference for interagency forces (Hypothesis 2 (H2)).

Likewise, it was assumed that the de-escalating conditions of the post-conflict phase would make events more recognizable. At this point, the unpredictable events recently encountered in times of escalation make it unlikely that their preexisting beliefs would have changed substantially (Bandura, 2001). Thus, it was expected that the retransition from war to the post-conflict phase would make the commanders of both sectors demonstrate a lower preference for interagency forces (Hypothesis 3 (H3)).

From an SCT perspective, commanders with high levels of operational experience would be less self-centered and more self-reflective and task oriented than those commanders with less operational experience. This is mainly because the experienced commanders' beliefs would have been formed by personal appraisals of how well the Norwegian crisis management system can handle the efforts required to deal successfully with hybrid attacks. This suggests that the more experienced commanders would have a high level of belief in their ability to enact the interagency potential available to them. Thus, this study expected that experienced commanders would show greater preferences for interagency forces than commanders with less operational experience (Hypothesis 4 (H4)).

Method

Scenario

The current hybrid warfare scenario (see Figure 1) was utilized because Norway's strategic environment was considered as a relevant context through which to achieve the study's aim. First of all, scholars contend that the functional boundaries between Norwegian police and military are highly sectorized but the way they are practiced have varied over time (Fimreite, 2014). The police unquestionably have the leading role in civilian crisis management (Regjeringen, 2013), while for the military, it is a secondary role (Regjeringen, 2021). However, in any armed attacks on Norway, the military will take the lead and cooperate with the police on tasks that are within the scope of their respective areas of responsibility (Forsvarsdepartementet, 1949).

Second, scholars discuss how hybrid attacks will bring about unusually difficult decision-making due to Norway's inherent societal vulnerabilities and sectoral constraints (Diesen, 2018). Third, serious shortcomings in the Norwegian emergency response system were identified in recent security crises and the need for improvements in police-military interoperability has been asserted in government whitepapers (Regjeringen, 2018; Røksundutvalget, 2016). Fourth, it makes sense to analyze police-military decision-making differences in Norway because the Norwegian police claim to be civilian-oriented (Spurkland, 2021), while scholars argue that Western police and military forces are gradually becoming more similar (Kraska,

Figure 1. The simulation's scenario.
Note. The image was created by the authors from a research planning session. The fictitious hostile state Murinus is based on the unclassified strategic scenario of NATO's Occasus exercise model.

2021; Lutterbeck, 2004). Finally, Norway's increasing importance as Europe's largest supplier of natural gas (Glover, 2022) makes the Norwegian oil and gas infrastructure a likely target for hybrid attacks (Hultgreen, 2022).

Respondents

A total of 102 volunteers (88 males and 14 females) completed the simulation. In addition, one respondent was lost because of equipment failure, and one respondent withdrew on the day of the simulation. The inclusion criterion of the police and the military group was a minimum of 5 years of active duty in their respective sectors.

The 59 military respondents were selected from all services (mean age = 44 years, range = 31–58) with 8 to 39 years active duty and ranks ranging from captain (OF2) to major-general (OF7) or equivalent. The previous operational experience from crisis management operations and/or exercises ranged from 0 to 35 significant incidents ($M = 8.2$).

The 43 police respondents were selected from the national police directorate and police districts (mean age = 45 years; range = 29–56; employment 6–35 years; number of exercises − range/mean of exercises 0–30/4.0).

Instruments

A laboratory cubicle was arranged as a simulated operations center/workstation with a keyboard and screen facing the respondents. The stimuli were physical handouts (i.e., organizational chart, attribute list of subordinate forces, legal information, maps, intelligence updates and policy documents) and digital slides (i.e., mission vignettes and multiple answer options) with pictures and text projected onto the screen. Computer software (iMotions 9.1.0.6) controlled the sequence of the slides and recorded all the respondents' responses. The transition from peace to war was established by a royal decree declaring a state of war. The transition from war to the post-conflict phase was done by a repeal of the earlier declared state of war. These kinds of royal decrees are authorized through a special provision in the Norwegian defense act that allows the military to establish police-military cooperation and resist with all means available in the event of an armed attack on Norway ("The Constitution of the Kingdom of Norway," 1917, p. §25). For a detailed description of the study design, see Figure 2.

To allow for realistic dilemmas in the stimuli, scenario, background documentation and mission vignettes were based on documentation from NATO's exercise Trident Juncture 2018 (North Atlantic Treaty Organization [NATO], 2018). The exercise tested and trained NATO's collective military and civilian efforts (i.e., police) during interagency crisis management (Joint Warfare Center [JWC], 2018). Demographic information (age, gender, profession, years of employment, and operational experience) were collected on the day of the simulation using a printed questionnaire.

Force composition was used as a dependent variable when testing H1 to H4. The variable involved matching police and military units to organize a force they considered feasible for various missions. Multiple answer options allowed the respondents to choose any combination of the available police and military forces (see Table 1). The respondents could choose to request support or reject missions. Details about support or justifications for rejecting missions were not collected.

The force composition data comprised the following categories: (a) Police forces (a single police unit or combination of police units). (b) Military forces (a single military unit or any combination of military units). (c) Interagency forces (a combination of at least one police and one military unit with or without external support). (d) Reject (none of the available forces).

Assessments of force composition were included as they are crucial in operational planning (NATO, 2019) and are particularly interesting in the domain of hybrid warfare (Crowther, 2021). In addition, force composition was regarded as replicating the way in which commanders in field settings accomplish tasks vicariously through the coordinated efforts of others (De Holan & Mintzberg, 2004).

Operational experience was collected by a single item asking: "How many crisis management operations and/or exercises have you participated in?" In this context, one question sufficed (Schmidt, 2018).

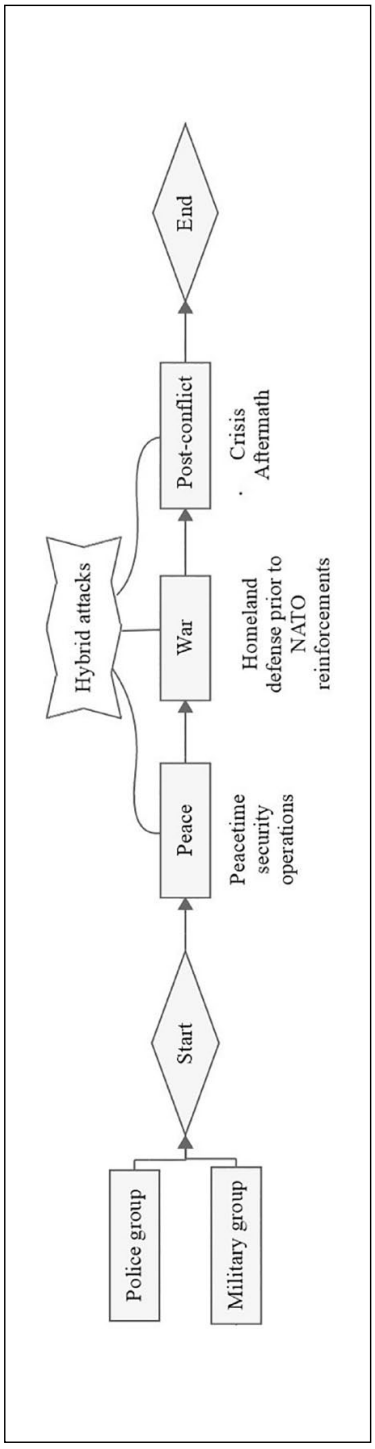

Figure 2. Study design.
Note. The chart was created by the authors as a visual description of each step in the simulation.

Table 1. Force Composition Options.

Police	Military	Interagency
Counter terrorism police	Special operations forces	A combination of at least one police- and one military unit with or without external support
Local SWAT team	Home guard rangers	
Police security service	Counter-intelligence	
Uniformed armed police	Armed military guards	

Procedure

Prior to the day of the simulation, the respondents were e-mailed information about the simulation's goals, the crisis scenario and what was expected of them. It included an approval letter from the Norwegian Center for Research Data (NSD) and an informed consent form consistent with international ethical standards of scientific research.

Before starting the simulation, the respondents were informed through a standardized briefing that explained the purpose of the study and how their job was to command an operational level headquarters. Further, they were informed about the conflict scenario and how they would be exposed to dilemmas through screen-based multiple answer options. They were told the simulation had no time limit and that it was being remotely observed by a researcher. They were told that their task was to allocate subordinate forces to missions, request support if needed, or choose to reject missions if they considered this to be appropriate. Once they had completed the task, they were told that computer software would communicate their decisions to the chain of command. Next, the respondents completed the demographics sheet.

They were informed that they could withdraw from the study at any point. During the introduction they were invited to ask questions. However, once the simulation started there was no communication between the respondents and the researcher. All respondents tested the same conditions (i.e., all missions and all phases) in an identical sequence.

The study comprised 54 independent missions across three phases (peace, war, and post-conflict) involving the same number of missions and task categories (direct action, arrest/detention, surveillance, and close protection). Each of the missions had unique and phase-specific vignettes.

Statistics

Hypotheses 1, 2, 3, and 4 were analyzed in SPSS 27 using a stepwise multinominal logistic regression involving 66 comparisons, of which 38 related to our hypotheses. Multinomial logistic regression is frequently used for calculating likelihood estimates of categorical data with continuous or categorical independent variables (Bull & Donner, 1987). Although our hypothesis required repeated measures, we were still able to use logistic regression as it is comparable with the methods used for longitudinal data (Fitzmaurice et al., 2012). The dependent nominal variable was Force

Table 2. Between-Group Odds Ratios for the Police and Military Commanders' Decision Preferences (Police Forces vs. Military Forces) Across the Simulation's Three Phases (Peace, War, and Post-Conflict).

Force composition	Main effect of sector and Interactions of Sector × Phase	Reference category	*B*	Wald	Sig.	Odds ratio (OR)	95% CI for OR	
							Lower bound	Upper bound
Police forces	Sector = Police[a]	Military forces	0.17	5.29	.021*	1.19	1.03	1.38
	Police × Peace[b]	Military forces	0.26	3.66	.056[c]	1.30	0.99	1.71
	Police × War[d]	Military forces	0.07	0.28	.598	1.07	0.83	1.38
	Police × Post-conflict[e]	Military forces	0.22	2.75	.097	1.24	0.96	1.61

Note. CI = confidence interval.
[a]The baseline parameter is Sector = Military. [b] The baseline parameter is Military × Peace. [c] Borderline significant. [d] The baseline parameter is Military × War. [e] The baseline parameter is Military × Post-conflict.
*$p < .05$.

composition (police force, military force, interagency force, and reject). The independent nominal variables of Sector (police/military) and Phase (peace, war, and post-conflict) were listed as factors. The independent continuous variable of Operational experience was used as a covariate.

A stepwise analysis was conducted in three stages: The first stage analyzed the between-group main effects of Sector and the interaction effects of Sector × Phase. The second stage analyzed the within-group interaction effects of Sector × Phase. The third stage analyzed the within-group interaction effects of Sector × Phase × Operational experience. The fit between the final model that only contained the intercept and data improved when we added the predictor variables, $\chi^2 = 306.862$, $p < .001$. Thus, the independent variables as a group significantly contributed to predicting the outcome (Laerd, 2018). There were no missing data.

Results

Force Composition, Between-Group Effects

When analyzing the between-group effects of Sector and Phase, one of four comparisons testing police forces versus military forces reached significance (see Table 2). One main effect supported H1, showing that police and military commanders overall were 19% more likely to use their own sector's forces unilaterally than use the other sector's forces only. The interaction that tested the preference of police commanders

for using police forces in peacetime was borderline significant ($p = .056$). The interactions of wartime and the post-conflict phase did not reach significance.

To ensure the expertise of the respondents, a one-way ANOVA (analysis of variance) was conducted (see Note 2). It demonstrated that the respondents made better decisions compared with a none-expert control group.[2]

Force Composition, Within-Group Effects

When analyzing the within-group effects of Sector × Phase, eight out of 16 comparisons reached significance when peace was used as the baseline. As shown in Table 3, one interaction supported H1 for the military and one interaction contradicted H1 for the police. Three interactions showed support for H2, and one interaction contradicted H2 for the police. Finally, two interactions contradicted H3, as demonstrated by the military commanders.

Military commanders were 98% more likely to prefer military forces over police forces in war (relative to peacetime), supporting H1. However, police commanders were 57% less likely to prefer police forces over military forces in war (relative to peacetime), contradicting H1.

When exploring H2, military commanders were 113% more likely to choose interagency forces over police forces in war (relative to peacetime). Similarly, military commanders were 234% more likely to choose interagency forces than reject missions in war (relative to peacetime). These findings support H2. For the military commanders, the comparison of interagency forces over military forces in war did not reach significance ($p > .05$).

Police commanders were 58% more likely to prefer interagency forces over police forces in war (relative to peacetime). This also supports H2. However, police commanders were 32% less likely to prefer interagency forces over military forces in war (relative to peacetime), which contradicts H2. For police commanders, the comparison of interagency forces versus reject in war was borderline significant ($p = .051$).

Our analysis did not show support for H3. However, it demonstrated sector differences in the post-conflict phase. For military commanders, H3 was contradicted by showing how they were more likely to prefer interagency forces in the post-conflict phase. As such, military commanders were 72% more likely to choose interagency forces over unilateral police forces, and 46% more likely to choose interagency forces over unilateral military forces in the post-conflict phase (relative to peacetime). In contrast, the preference of police commanders for interagency forces in the post-conflict phase (relative to in peacetime) was nonsignificant.

The Effect of Operational Experience

When analyzing the effects of Sector × Phase × Operational experience, eight out of 18 interactions supported H4 (see Table 4).

Table 3. Within-Group Odds Ratios for the Police and Military Commanders' Decision Preferences (Interagency Forces vs. Police Forces, Military Forces or Reject and Military Forces vs. Police Forces) in Wartime and the Post-Conflict Phase (Relative to in Peace).

Force composition	Interactions of Sector × Phase	Reference category	*B*	Wald	Sig.	Odds ratio (OR)	95% CI for OR	
							Lower bound	Upper bound
Interagency forces	Military × Post-conflict[b]	Police forces	0.54	13.55	<.001***	1.72	1.29	2.30
	Military × War[b]	Police forces	0.75	24.83	<.001***	2.13	1.58	2.86
	Police × Post-conflict[c]	Police forces	−0.09	0.45	.501	0.91	0.70	1.19
	Police × War[c]	Police forces	0.46	10.33	.001**	1.58	1.20	2.10
	Military × Post-conflict[b]	Military forces	0.38	4.94	.026*	1.46	1.05	2.03
	Military × War[b]	Military forces	0.07	0.19	.663	1.07	0.78	1.47
	Police × Post-conflict[c]	Military forces	−0.18	1.03	.310	0.84	0.59	1.18
	Police × War[c]	Military forces	−0.38	5.23	.022*	0.68	0.49	0.95
	Military × Post-conflict[b]	Reject	0.23	0.79	.376	1.26	0.76	2.07
	Military × War[b]	Reject	1.21	14.01	<.001***	3.34	1.78	6.29
	Police × Post-conflict[c]	Reject	−0.25	0.49	.484	0.78	0.39	1.57
	Police × War[c]	Reject	0.92	3.82	.051[d]	2.51	1.00	6.32
Military forces	Military × Post-conflict[b]	Police forces	0.17	1.09	.298	1.19	0.86	1.63
	Military × War[b]	Police forces	0.68	18.27	<.001***	1.98	1.45	2.71
	Police × Post-conflict[c]	Police forces	0.09	0.23	.629	1.09	0.76	1.56
	Police × War[c]	Police forces	0.84	21.67	<.001***	2.33[a]	1.63	3.32

Note. CI = confidence interval.

[a]The in-text interpretation of this odds-ratio has been recalculated. [b] The baseline is Military × Peace. [c] The baseline is Police × Peace. [d] Borderline significant.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4. Within-Group Odds Ratios to Determine the Effect Of Operational Experience on the Police and Military Commanders' Decision Preferences Across the Simulation's Three Phases (Peace, War, and Post-Conflict).

Force composition	Interactions of Sector × Phase × Operational experience	Reference category	*B*	Wald	Sig.	Odds ratio (OR)	95% CI for OR	
							Lower bound	Upper bound
Interagency forces	Military × Post-conflict × Operational experience	Police forces	−0.004	0.164	.686	0.996	0.979	1.014
	Military × War × Operational experience	Police forces	0.012	1.510	.219	1.012	0.993	1.031
	Military × Peace × Operational experience	Police forces	0.028	9.944	.002**	1.028	1.010	1.046
	Police × Post-conflict × Operational experience	Police forces	0.045	9.580	.002**	1.046	1.017	1.077
	Police × War × Operational experience	Police forces	0.036	5.153	.023*	1.037	1.005	1.07
	Police × Peace × Operational experience	Police forces	0.037	7.463	.006**	1.038	1.011	1.066
Interagency forces	Military × Post-conflict × Operational experience	Military forces	−0.001	0.013	.909	0.999	0.979	1.019
	Military × War × Operational experience	Military forces	0.008	0.733	.392	1.008	0.990	1.025
	Military × Peace × Operational experience	Military forces	0.036	11.028	.001**	1.037	1.015	1.059
	Police × Post-conflict × Operational experience	Military forces	0.036	4.296	.038*	1.037	1.002	1.072
	Police × War × Operational experience	Military forces	0.039	6.110	.013*	1.039	1.008	1.072
	Police × Peace × Operational experience	Military forces	0.087	9.200	.002**	1.091	1.031	1.153
Interagency forces	Military × Post-conflict × Operational experience	Reject	0.000	0.000	.990	1.000	0.970	1.030
	Military × War × Operational experience	Reject	0.002	0.007	.932	1.002	0.959	1.046
	Military × Peace × Operational experience	Reject	0.019	1.466	.226	1.019	0.988	1.051
	Police × Post-conflict × Operational experience	Reject	−0.018	0.611	.435	0.982	0.938	1.028
	Police × War × Operational experience	Reject	−0.026	0.523	.470	0.974	0.908	1.045
	Police × Peace × Operational experience	Reject	−0.026	1.214	.270	0.974	0.931	1.02

Note. CI = confidence interval.
*$p < .05$. **$p < .01$.

The analyses demonstrated that the more experienced military commanders showed greater preference for interagency forces over both police forces and military forces (relative to the less experienced military commanders) in peacetime, thereby supporting our H4. In this context, a military commander's preference for interagency forces over police forces increased by 2.8% per increment of operational experience. For example, military commanders with previous experience of at least ten crisis management operations were 28% more likely to prefer interagency forces compared with military commanders with no such experience. Similarly, further support for H4 was found as the preference of military commanders for interagency forces over military forces in peacetime increased by 3.7% per increment of operational experience. For military commanders, this effect of operational experience did not reach significance in either wartime or the post-conflict phase.

Significant effects were found for the preference of police commanders for interagency forces over police forces (relative to the less experienced police commanders) across all phases. Their preference for interagency forces increased by 3.8% per increment of operational experience in peacetime. In wartime, their preference for interagency forces increased by 3.7% per increment of operational experience. In the post-conflict phase, their preference for interagency forces increased by 4.6% per increment of operational experience.

Experienced police commanders also had a higher preference for interagency forces over military forces (relative to less experienced police commanders) throughout the simulation. In peacetime, their preference for interagency forces increased by 9.1% per increment of operational experience. During wartime, their preference for interagency forces increased by 3.9% for each increment of experience. The last finding was in the post-conflict phase in which the preferences of police commanders for interagency forces increased by 3.7% per increment of operational experience.

Discussion

This study showed how professional experiences over long-term careers shaped self-referent capabilities (Bandura, 2001) that facilitated differences in the way in which the police and the military preferred to organize their forces to conduct a given mission.

Hypothesis 1 (H1) was supported by a main effect of sector background across the simulation, irrespective of phase transitions. It showed that police commanders in general favored police forces over military forces and military commanders favored military forces over police forces. There were also interaction effects showing mixed support for H1 in wartime, in which it was supported by the military commanders but contradicted by the police commanders. This sector difference could be interpreted as commanders' decisions were intentionally motivated by self-referent thinking to ensure that missions were conducted in line with previous experience. Thus, the reported sector difference loosely showed how, when confronted by uncertainty,

commanders were predisposed to go beyond the evidence given by events and translated their beliefs into distinct behavior using their occupational preferences.

Hypothesis 2 (H2) on the effect of conflict escalation was partially supported. Our analysis showed that a change from peace to war increased the preference of commanders for interagency solutions. As such, it could be argued that commanders adjusted their beliefs dynamically by monitoring themselves and the outside world (Bandura, 1997). We found evidence that escalation made military commanders prefer interagency solutions more than any other options in wartime. However, we only found mixed evidence for this among the police commanders. The police commanders' preference for interagency forces increased if the only other option was to use police forces, although not when interagency forces were compared with military forces.

The varying effect of escalation due to contrasting backgrounds demonstrated the selective nature of self-referent thoughts (Jones, 1989). Thus, the partial support of H2 indicates how self-referent mechanisms have a dual function. They can be both inhibitive through self-sanctioning and proactive through self-motivation of the actions needed to produce feasible results (Bandura, 1999, p. 162). As such, it can be claimed that commanders knew the risks of cognitive complacency and actively used their previous experience to avoid decision inertia by heightening their cognitive readiness (Cosenzo et al., 2007) when confronted by uncertainty. For example, the commanders did not allocate all their resources to one mission. Instead, they constructed adequate solutions and kept units in reserve for contingencies. However, the demonstrated sector differences appeared to indicate that the commanders' self-referent thinking resulted in distinct behavioral adjustments as the conflict was escalated. It is therefore important to recognize that escalation not only led to a selective increase in the preference for certain options (i.e., interagency and military forces) but also led to inhibitions of the other options (i.e., police forces and reject). Thus, our results showed that inhibitive forces are as important as proactive forces. We believe that understanding this dual functioning is essential for improving interagency efforts.

Hypothesis 3 (H3) on the effects of conflict de-escalation was not supported. However, sector differences were found as police and military commanders had different interpretations of how the post-conflict phase resembled the pre-war peacetime phase. From a social cognitive perspective this makes sense, as their distinct occupational beliefs would not have significantly converged because the highly uncertain links between events and actions complicated the learning process (Bandura, 1986, p. 66). Consequently, it would appear that their previous experience rather than the actual situation prescribed the actions in the post-conflict phase. Interestingly, our analysis showed that the police's preferences for interagency forces in the post-conflict phase did not differ significantly when compared with peacetime. In contrast, military commanders seemed to prefer interagency solutions more in the post-conflict phase than in peacetime.

The police's post-conflict preferences, juxtaposed with the military's preference in the post-conflict phase, will be important to take into consideration in future crises. As shown, the relative contribution of the commanders' self-referent thoughts

changed differently according to their respective sector backgrounds. Thus, like in wartime, it could be argued that the commanders had different interpretations of what was and what was not happening after transitioning into a new phase. It may well be that police commanders saw hostilities as something similar across situations and therefore kept their conduct in line with their established beliefs, whereas the military commanders may have believed that changing circumstances warranted a more flexible interpretation of events. This is an interesting finding that should be addressed in future research.

Hypothesis 4 (H4) on operational experience received mixed support. Since domain-specific self-referent thinking enhance people's ability to act efficiently despite uncertainty (Bandura, 2006, p. 176), we hypothesized that experienced commanders would relapse into preexisting behavioral patterns to a lesser extent than their less experienced counterparts. Experienced commanders would have demonstrated more competence than their less experienced colleagues. This was extended to suggest that commanders with higher levels of operational experience were predisposed toward preferring state-of-the-art interagency solutions. Our analysis showed that experienced police commanders had a significantly higher preference for interagency solutions (relative to less experienced police commanders) throughout the simulation. For the military commanders, this effect of operational experience occurred only in peacetime.

This sector difference showed the functional value of operational experience, and how self-referent thinking resulted in different behavior according to the context and a commander's background. It also loosely demonstrated how the effect of operational experience may disappear if contextual shifts are construed as a discontinuation rather than a continuation of the patterns used to explain the relative contribution and functional dependence of events. As shown by SCT (Bandura, 1986), people's decisions are not only influenced by their expectations of the immediate consequence but also by their judgments of future outcomes should they stick to current preferences. In this way, the police commanders seemed to have expected that persistence would provide favorable outcomes. In contrast, the military commanders seemed to have expected that a continuation of peacetime preferences would be less effective as the crisis evolved. Interestingly, our temporal analyses seemed to illustrate SCT's explanation of the links between preferences and context, and how behavior is partially governed by the way in which cognitive processes interact with contextual, affectual, and biological events (Bandura, 2001). The way in which higher levels of operational experience resulted in sector differences could point to such a triadic process. In this context, the commanders' occupational background and previous experience would have given their behavior substance and direction.

One potential explanation of the sector differences demonstrated by our study is that behavior will be enduring unless it happens to be changed by a significant event (Bandura, 1999, p. 177). Thus, our results would appear to indicate that the police and the military construed the gradations of environmental changeability across the simulation differently. On an intuitive level this makes sense, since the previous

experience of police commanders is mainly from taking charge of immediate operations and demanding responsive and dynamic decision-making (Lundgaard, 2021). In contrast, a military commander's experience is based on more deliberate operations, and often implies a broader dimension of time and space (Høiback, 2016). Once again it appears that the distinct belief systems of the police and the military make them think differently about various courses of actions and the effects they may achieve in homeland defense. Interestingly, by demonstrating how contrasting backgrounds resulted in distinct but equally feasible decisions, our analysis expands previous findings which show that the more domain-specific experience an individual has, the more feasible their choice will be (Klein et al., 1993).

Given this discussion, future studies can gain more knowledge about the behavior of commanders from contrasting backgrounds in dynamic contexts by using psychological theories, quantitative methods, and statistical tests. While the current analysis explored established operational factors such as force composition, its findings could be expanded by measuring the ways available forces, resources and time are utilized to achieve strategic objectives. Self-efficacy theory (Bandura, 1997) might be particularly relevant to explain a commander's capacity to conduct high level coordination and whether or not operational events trigger behavioral change. More research is also needed on the decision-making of command teams. Future research could test the ways single or multiple agency command teams adapt to changing circumstances, as well as investigating the boundary conditions between the decision-making of command teams and individual commanders.

This study used SCT to explain why sector differences can occur but did not explore the effects of SCT's subprocesses (i.e., self-efficacy) or any other interdisciplinary aspects that could offer alternative explanations. For example, we found distinct predispositions in the preferences of the police and the military, but we cannot explain why we did not find the expected effect of operational experience. This could suggest that the measurements were too coarse, or our choice of decision elements could have included other elements (i.e., the information aspect). This could have resulted in further explanations but was excluded due to our choice of statistical tests and experimental design. However, the study's hybrid warfare scenario was professionally relevant and engaged all our respondents. This, together with our simulation's naturalistic features of experienced decision-makers, inadequate information, strategic aims, dynamic conditions, and coordination of subordinates (Klein et al., 1993), likely mitigated some of the adverse effects of the simulated environment (Levitt & List, 2007).

It could be argued that the respondent sample had wide differences in rank. As such, the analysis cannot ascribe the outcome to the respondents' rank, but more importantly it measured the effects of domain-specific operational experience. This approach is reasonable since it reflects how decision-making will span several levels of rank due to the broad ranging nature of staff-work in crises (Thürmer et al., 2020). In this context, our comparisons are consistent with how earlier work on the behavior

of professionals (Ericsson et al., 2007) recommend that the level of task knowledge should be assessed instead of assuming competency based on seniority or rank.

In addition, the respondent sample was mainly restricted to high-ranking male commanders and the results may not be fully generalizable to other groups or sectors. Including sectors with a higher proportion of women, sectors including fewer high stakes and less uncertainty (e.g., education), sectors with more fixed environments (e.g., transport), and sectors in which issues are mainly dealt with on a tactical level (e.g., autonomously managed nongovernmental organizations). However, homeland defense is much the same as other comprehensive efforts in which professionals cooperate in extraordinary circumstances. This makes it likely that our results are generalizable to other groups that work with crisis management (e.g., health care, economic, fire, and rescue).

Conclusion

This study provides new empirical findings that expand the assertions of previous research discussing that the military and police professions are significantly different in spite of surface similarities (Campbell & Campbell, 2010). The hypotheses predicted that the commanders' occupational background and previous experience would impact their decision-making to the extent threats were interpreted as changed across the phases of a hybrid attack-scenario. In this context, the analysis demonstrated several significant differences in the ways the transitions between war and peace had different effects on the police and military commanders' decision-making.

With respect to the commanders' postulated predisposition toward favoring their own sector's forces, the results supported the hypothesis. The data also supported the hypothesis about increased preferences for interagency forces in wartime. Concerning the hypothesized decreased preference for interagency forces in the post-conflict phase, the police commanders demonstrated no support for this hypothesis while it was contradicted by the military commanders. Finally, in the peace phase, there was support for the hypothesis that the effects of operational experience increased the commanders' preference for interagency forces. However, in the war and post-conflict phase this effect was only demonstrated by the police commanders.

The present findings elaborate how the police and military's decision-making differences likely originate in the respective sectors' professional development of domain-specific skills. Such development shapes a commander's aspirations and the benchmarks they select as marks of adequacy when interpreting change. SCT describes how these self-referent structures grow progressively as knowledge is acquired and challenges are met (Bandura, 2001). Given the current results, these psychological mechanisms could explain the demonstrated sector differences and differing effects of phase-transitions and operational experience between police and military commanders.

The findings can also account for some of the interoperability issues currently experienced by the police and the military. For example, why information sharing across agencies can be cumbersome (Pardo et al., 2008) and why ideas about roles

and responsibilities often diverge in the security sectors (Bjerga & Håkenstad, 2013; Diesen, 2013; Winge, 2021). If, as indicated by our analysis, the disaggregated means of hybrid attacks erode the established norms of traditional police and military operations in ways that makes unilateral efforts increasingly less preferable, it seems evident how multiple lines of operations that traverse police-military boundaries can help enable opportunities for a full-spectrum set of governmental responses. Thus, the current findings support the way Johnson (2018, p. 159) argues that efficient approaches to hybrid attacks require decision-makers to understand the threats' true implications rather than turning them into something they are not. These emerging and interactive social cognitive aspects of hybrid attacks underscore why effective interagency efforts need prudent decision-making to find the middle ground between fully conforming to situational demands and stubbornly honoring preexisting beliefs when managing the high stakes of homeland defense.

To that end, our results constitute new empirical findings that extend the research on decision-making in high stakes and uncertain contexts in which outcomes are difficult to predict, and there are no ideal options (Marchau et al., 2019; Shortland et al., 2019; van den Heuvel et al., 2012). The results also support previous findings showing how hybrid warfare has distinct implications for decision-making and strategy (Monaghan, 2019). In addition, the results add new knowledge about sector differences that can be used to improve governmental decision-making processes.

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Notes

1. Exploratory approaches attempt to discover something new by describing the relationship between variables to generate predictions about the phenomena in question (Swedberg, 2020). As argued Stebbins (2001), the continued significance and relevance of exploratory approaches are in large part because they provide a coherent process (Casula et al., 2021) using inferential statistics (Kaplan, 2017) that are relatively independent of the researcher (Johnson et al., 2007). As shown by the present study's analysis, deductive hypothesis testing allowed for new and important empirical findings to be discovered.

2. To measure the respondents' decision-making performance, a force composition performance score was calculated by two independent subject matter experts. The one-way ANOVA analysis showed a significant effect of Group: $F(2, 109) = 14.91$, $p < .001$. A post hoc LSD test revealed that the control group's decision-making performance was significantly lower compared with the police group $p < .001$ and the military group $p < .001$. No other significant differences were found between the performance of the police and the military groups. The interrater reliability of the force composition performance score showed an intraclass correlation of .81 ($p < .001$).

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Effect of changing threat conditions on police and military commanders' preferences for urgent and offensive actions: An analysis of decision making at the operational level of war

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ABSTRACT

A simulation was conducted to examine the decision making of 102 high-ranking police and military commanders (male/female = 88/12, mean years of employment = 22.15) engaged in a simulated hybrid attack on Norway. Four 2 × 3 repeated-measures ANOVA tests were performed, with two groups (police, military) and three phases (peace, war, and post-conflict) as independent variables. The decision tasks of force posture and mission urgency, along with Subject Matter Expert (SME) ratings of decision-making performance, served as dependent variables. By using social cognitive theory as the theoretical framework, the analysis demonstrated within-group effects indicating how the transition from peace to war caused more offensive postures, higher urgency levels, and increased performance in wartime. Between-group differences were also found, illustrating that police commanders had higher levels of urgency than military commanders in general. Regarding force posture, within-group differences were only found in the post-conflict phase, when police commanders returned to pre-war levels, while military commanders showed less offensive postures than in peacetime. No significant between-group differences were found in decision-making performance. The analysis demonstrated new empirical findings about how crisis management is impacted by change and the backgrounds of those in charge. The findings have implications for designing interagency frameworks that improve police-military interoperability in collaborative efforts.

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Decision making; hybrid attacks; police-military collaborative crisis management; social cognitive theory; force posture; mission urgency

What is the public significance of this article?—This study advances the idea that there are distinct decision-making differences in security crisis defined by the phase in which threats appear, especially how transitioning from peace to war may lead to more offensive and urgent actions by both police and military commanders. It also describes how the commanders' performance was highest in wartime. This highlights how we need to determine ways to improve the police and military's approach to security threats situated below the threshold of war.

Introduction

The effectiveness of new and emerging security threats has brought revived prominence to debates of how hybrid attacks represent unique difficulties for governmental decision-makers in Western countries (Jensen & Bogart, 2022). In these contexts, hybrid attacks are unusually consequential in the way they combine violent and nonviolent means to exploit the inherent weaknesses of open societies (Weissmann et al., 2021), creating political crises that call for urgent responses by higher levels of government (Dyson & t'Hart, 2013, p. 397). At its core, the cross-sectoral impact of hybrid attacks complicates people's binary ideas about external and internal security (Bossong & Rhinard, 2021). This transboundary sphere blurs the functional lines between the police and military's conventional tasks (Lutterbeck, 2004) and has prompted scholars to question the feasibility of current decision-making frameworks (Eriksson & Rhinard, 2009). Their core argument is that even if hybrid attacks impact both the police and military, they are not necessarily managed most effectively through highly sectorized approaches (Speranza, 2020). For this reason, research argues that national governments need an improved understanding of how sectoral vulnerabilities and collective interests enable cohesive approaches to hybrid attacks (Cullen & Reichborn-Kjennerud, 2017, p. 4).

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Discussions on decision making in security crises involve descriptions of how threats are perceived by government officials (Herrmann, 2013) and how their interactions can explain a state's behavior (Redlawsk & Lau, 2013). In this context, a growing number of contributions argue that police-military responsibilities are increasingly contested (Hjellum & Lægreid, 2018) and that the implications of today's decision-making issues are difficult to predict in future crises (Shepherd & Alistair, 2021). However, their late consequences are exemplified in official reports from recent security crises in the United Kingdom (Murphy, 2006), Israel (Matthews, 2011), Norway (Gjørv et al., 2012), Germany (Fleisher, 2014), and the United States (Hoffman et al., 2015). There is an agreement between the authors that shortcomings in interagency interfaces caused a string of seriously flawed decisions, and all share a preoccupation with improving interagency interoperability by coming to grips with how security crises impact governmental decision-makers.

Against this background, it is remarkable how little knowledge exists about the ways higher levels of government interpret modern security threats (Yarhi-Milo, 2014, p. 23). Many studies illustrate how divergent preferences represent a problem for current perspectives on decision making (Houghton, 2015, p. 290). Even so, scholars argue that we lack empirical insights into the behavior of police and military decision-makers (Shortland et al., 2019, p. 47), even though these agencies have the greatest impact on the outcomes of security crises. Thus, the current study asks the following question: How do changing threat conditions impact the predispositions of police and military commanders toward urgent and offensive actions? The objective was to gain new knowledge about a targeted state's decision making and to improve the capability of societies to plan, respond to, and recover from hybrid attacks.

The social cognitive foundation for decisions in hybrid attacks

As the police and military sectors are two distinct domains that intersect in crises (Wither, 2020), the current study used Albert Bandura`s (2011) social cognitive theory (SCT) to analyze how the domain-specific skills of police and military commanders impact the stakes they see and the stance they take. Building on the ways preexisting beliefs are made salient in decisive moments (Gilovich et al., 2002), SCT describes the cognitive processes determining why individuals tend to differ systematically in how they behave. An advantage of SCT is that it explains how uncertain events become informative through self-referent thoughts activated by previous experience from related task domains (Bandura, 1999, p. 181). These anticipatory thoughts motivate individuals by providing them with meaningful, but idiomatic interpretations of their previous experiences' relevance in the face of the demonstrated efficacy of ongoing actions (Schunk & Usher, 2019). Accordingly, the police and military commanders' contrasting competencies lead to selective assessments of threats and determine the degrees to which they choose to commit or withdraw resources once new information is considered (Bandura, 1999). Indeed, there are several reasons to expect that such sectoral differences may be even more enhanced in unpredictable and surprising situations (Marchau et al., 2019, p. 28).

Firstly, SCT describes how efficacy beliefs derived from previous experience make decision making easier in both routine and unexpected situations (Bandura, 1999). This is supported by scholars describing how professionals justify assumptions and motivate actions more efficiently than novices (Linou & Kontogiannis, 2004) and that cognitive resources are required in order to know when to surpass standardized procedures in uncertain circumstances (Klein, 2011, p. 28). In this context, SCT explains how individuals exercise control over events by promoting existing abilities or implementing new ones when adapting to change (Bandura, 1986). However, SCT also underlines that there is a marked difference between possessing skills and being able to use them well in dynamic contexts (p. 391). Examples from hybrid attacks include the ability to understand emerging threats, the interpretation of organizational norms, and the strategic use of shared resources to inform and influence actions appropriately.

Secondly, literature on governmental decision making asserts the importance of understanding how preferences are shaped at higher command echelons and the degrees to which they are adjusted over time (Mintz et al., 2021, p. 159). In this context, the research of Halperin et al. (2006) discusses how organizational norms provide powerful perceptual frames that shape decision making in crises. This is supported by research illustrating how professionals prefer methods that have proven effective in day-to-day challenges (Goitein & Bond, 2005, p. 123) and by studies describing how preferences established through personal experience are more robust and more predictive of behavior than weaker preferences (Baumeister & Finkel, 2010, p. 234). However, studies also show that situations involving high stakes tend to challenge people's preferences (Kunreuther et al., 2002) and that stubborn beliefs can cause vulnerabilities in dynamic conditions (Klein,

2011, p. 5). This effect is described by research showing how self-referent processing of both personal, behavioral, and situational factors tends to produce qualitatively distinct performances across a wide range of situations (Kemeny, 2003, p. 128), including policing (Baldwin et al., 2019) and military operations (Gamble et al., 2018).

Thirdly, when explaining the behavior of government officials, studies show how previous experience is used as reference points that can exacerbate cognitive biases and preclude consideration of options that are outside the scope of their respective organizations (Stein, 2013, p. 371). The specific effects of these self-referent thoughts are discussed by studies claiming that police commanders' preferences are formed by their enactive and vicarious day-to-day management of immediate operations (Lundgaard, 2021); favoring quick responses (Myhrer, 2015) and avoiding inaction to seize fleeting opportunities (Miner & O'Toole, 2020; Roud, 2021). By contrast, scholars claim that the preferences of military commanders are derived from the deliberate nature of military operations (Vego, 2015), involving delays and adaptive coordination of objectives across multiple tasks and timeframes (Goodwin et al., 2018). According to SCT, these discussions suggest that the current study's police/military respondents would have different evaluations of their capabilities and what to do with the skills they possess (Bandura, 1997). There are thus good reasons to expect that sector differences readily apparent in the police and military's unilateral operations will also be evident in collaborative crisis management.

Fourthly, on finding out how threats lead some to withdraw, while others become more risk seeking, Lerner and Keltner (2001) use the heuristics identified by Kahneman and Tversky (1973) to discuss how cognitive appraisals of personal factors influence the activation and maintenance of mobilizing or avoidant behavior. In a social cognitive view, research shows that the most relevant heuristic in uncertain and changing circumstances is probably anchoring-and-adjustment (Cervone & Peake, 1986, p. 492). It refers to how people self-reflectively assess information by comparing it with an initial reference point (i.e., preexisting beliefs and organizational norms) and make adjustments until a plausible estimate is reached (Epley & Gilovich, 2006). As stated by Klein (2011, p. 56), anchoring-and-adjustment often gives correct answers when people must make a decision, but do not know the exact answer (as will be the case when confronting threats that are unexpected relative to the decision-makers' competencies). Another way to look at anchoring-and-adjustment lies in how SCT explains the emergent nature of people's thoughts about their ability to perform a task, how this interactive process is based on previous experience determining the number of options considered, and how predictive cues are used selectively to guide behavior (Bandura, 1997). In this context, tasks seen as warranting offensive actions by one could be a defensive task for a second and may even remain an unresolved task for a third.

In sum, the current study regards SCT as a theoretically justified approach for empirical exploration of the decisions police and military commanders must make in security crises. The chief message to be understood from SCT is that decisions are enabled by the ways self-referent thinking predicts future events well enough for commanders to identify courses of action they believe will produce desirable outcomes. In hybrid attack contexts, the vicarious initiation of defensive or offensive operations thus depends not only on the commanders' efficacy beliefs regarding immediate actions, but also on their inferences about the rules governing how tactical operations are translated into strategic effects. Accordingly, commanders preferring offensive actions will continue, even though this implies conflict escalation and a higher risk of casualties, if they expect persistent offensives to eventually accomplish what they seek. In contrast, the same risks will serve as inhibitors rather than facilitators of offensive actions if they expect that continued offensives will be ineffective (Bandura, 1986, p. 27).

Hypothesis

The ambiguous nature of hybrid attacks (Weissmann et al., 2021) and the simulation's bidirectional transitions between peace and war seem to fit the changing settings that SCT predicts will require domain-specific knowledge (Schunk & Usher, 2019) for individuals to assess threats, exercise control, and adjust behavior as the situation calls for it (Grier, 2012; Tsai et al., 2019). In uncertain contexts, scholars claim that individuals tend to redouble their efforts in attempts to gain control (Klein, 2011, p. 228) and that this tendency often leads to more offensive and urgent action in security crises (Feaver, 2009). Considering how SCT describes the functional role that previous experience serves and how crises evoke resolute decision making, the current study first hypothesized (H1a) within-group differences showing that transitioning from peace to war would increase posture and urgency in both the police and military group. Likewise, it was hypothesized (H1b) that both groups' posture and urgency decisions would return to peacetime levels in the post-conflict phase.

Secondly, the study hypothesized between-group effects in the commanders' preference for offensive postures and urgent actions. The organizational norms and previous experience of police commanders would have provided excellent insights about the rights and wrongs in civilian crisis management (Bandura, 1997), predisposing them toward taking the initiative and responding quickly to seize fleeting opportunities (Crank, 2015, p. 286). It was thus hypothesized (H2a) that police commanders would demonstrate more offensive and urgent decision making in the peace and post-conflict phase when compared to military commanders. Similarly, the previous experience of military commanders would provide elevated efficacy beliefs in wartime and, as argued by Posen (2014, p. 69), a preference for taking the offensive through counterforce and initiative. As such, it was hypothesized (H2b) that military commanders would demonstrate more offensive actions and greater urgencies in times of war when compared to police commanders.

Thirdly, SCT explains why there is a difference between possessing skills and being able to use them well in change (Bandura, 1986, p. 391), and how the skills of professionals enable them to exercise control and act efficaciously in their respective domains, despite uncertainty (Bandura, 1999, pp. 181–183). Inexperienced commanders could thus demonstrate suboptimal performance, even though they knew what to do, because they questioned the feasibility of unfamiliar, but necessary actions. De Keyser and Woods (1990) demonstrated how this kind of suboptimal performance occurs if individuals are fixated on previous experience and fail to revise assessments. Thus, the commanders' ability to adapt to change would fail if they relied too heavily on their previous experience. Accordingly, police commanders were expected to have the best insights and perceived high levels of control in times of peace and post-conflict. Similarly, military commanders would be most efficient in wartime conditions. In this context, it was hypothesized (H3a) that military commanders would demonstrate higher decision-making performance than police commanders in wartime. Similarly, police commanders would achieve the highest decision-making performance in peacetime and post conflict (H3b). The hypotheses are illustrated in Figure 1.

Method

Respondents

A total of 102 volunteers participated. The inclusion criterion was at least 5 years of active duty in the police or military sector.

The 59 military respondents (53 males and 6 females) were selected from all services and the national joint headquarters (mean age: 44 years, range: 31–58), with 8 to 39 years of active duty and ranks ranging from captain to major-general or equivalent.

The 43 police respondents (34 males and 9 females) were selected from the national police directorate and police districts (mean age: 45 years; range: 29–56), with 8 to 35 years of active duty and ranks ranging from inspector to assistant chief of police.

Measures

The simulation exercise was conducted at a simulated workstation at the national headquarters with a keyboard and screen facing the respondents. The stimuli were

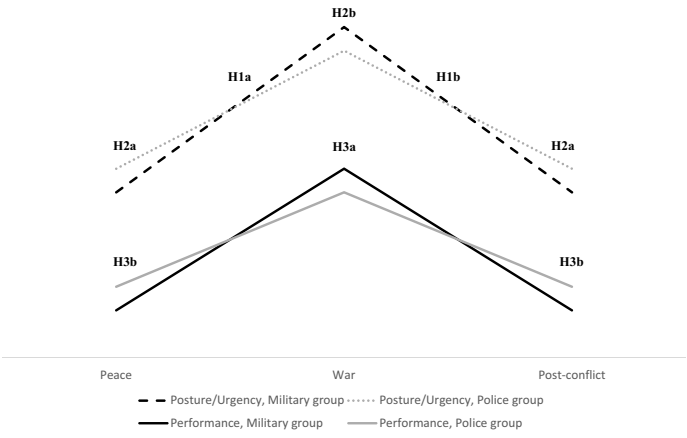

Figure 1. Graphical illustration of the hypotheses developed for investigation.

physical handouts (i.e., organizational charts, attribute lists of subordinate forces, legal information, maps, intelligence updates, and policy documents) and digital slides (i.e., mission vignettes and multiple-answer options), with pictures and text projected onto the screen. Computer software iMotions (2022) version 9.1.0.6 controlled the sequence of the slides and recorded all the respondents' decisions. To allow for realistic dilemmas in the stimuli, the scenario, background documentation, and the 54 mission vignettes were based on high-level scenarios from NATO's Trident Juncture 2018 exercise (NATO, 2018) and the Occasus setting (Derksen, 2018), in which a fictitious peer-level opponent challenged Norway on a broad arc from Svalbard to the Skagerrak.

Demographic information (age, gender, profession, and years of employment) was collected on the day of the simulation exercise using a printed questionnaire.

Procedure

Before starting the simulation, the researcher introduced the study's method and aim of gaining knowledge about factors influencing government officials in hybrid attacks. The respondents were told that their job was to command a national headquarters through a screen-based simulation remotely observed by a researcher. They were informed that the simulation had no time limits that they could withdraw at any point and that once it had started there could be no communication between the respondents and the researcher.

After the respondents had signed an informed consent form, all of the subsequent data was collected electronically in the context of the simulation's 54 independent missions. The simulation's three phases (peace, war, and post-conflict) involved equal numbers of missions per phase. The transition from peace to war followed the 18th mission and was initiated by a royal decree announcing a state of war. The re-transition from war to post-conflict followed the 36th mission and was initiated by a reversal of the previously enacted royal decree. All respondents tested the same conditions (i.e., all missions and all phases) in an identical sequence.

Dependent variables

Force posture[1]

Force posture was measured using a 10-cm Visual Digital Scale (VDS) in each mission (Figure 2). The respondents indicated their force posture-guidance by placing a marker on the VDS. The anchor points were "be very defensive" (i.e., risk of escalation should be avoided) and "be very offensive" (i.e., all necessary coercive techniques may be used). The VDS midpoint indicated that the overall aim was to maintain the status quo, and while escalation should be avoided, the force was allowed to stand its ground. The variable was computed as a sum centimeter over the 18 measurements in each phase.

When conducting assumption checks, the Mauchly's test of sphericity was not significant ($p > .05$). The Levene's tests were non-significant in peacetime ($F(1,100) = 0.01$, $p = .953$); wartime ($F(1,100) = 0.19$, $p = .663$); and post-conflict ($F(1,100) = 0.56$, $p = .457$).

Mission urgency[2]

Mission urgency was measured by 10-cm VDS in each mission (see Figure 3). The respondents indicated their mission urgency guidance by placing a marker on the VDS. The anchor points were "No priority" (i.e., respond at one's own convenience) and "very high priority" (i.e., immediate action necessary). The VDS midpoint indicated "respond within the next 24 hours." The variable was computed as a sum centimeter over the 18 measurements in each phase. The Mauchly's test of sphericity was significant ($\varepsilon = .92$, $p = .003$), the Huynh–Feldt correction was thus used when calculating the variable's F-ratios. The Levene's tests were non-significant in peacetime ($F(1,100) = 0.01$, $p = .937$); wartime ($F(1,100) = 2.36$, $p = .127$); and post-conflict ($F(1,100) = 0.29$, $p = .593$).

Subject Matter Expert (SME) ratings of decision-making performance

The respondents' decision-making performance was measured by one police and one military SME who

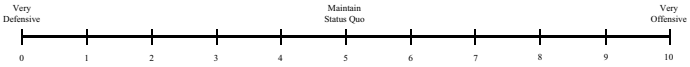

Figure 2. Force posture-scale.

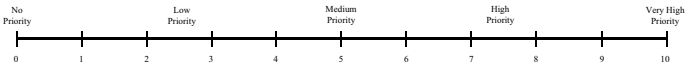

Figure 3. Mission urgency-scale.

were blind to the experimental setup. The SMEs were selected based on their high levels of academic qualifications and professional knowledge accumulated from more than 30 years of involvement in various security crises. The extent of their competencies thus made them subject matter experts in crisis management.

For each mission per respondent, the SMEs assigned a score to both the force posture and mission urgency decisions as an ordinal variable (0 = low performance), (1 = medium performance), and (2 = high performance). The force posture SME ratings were computed as a sum of the 18 force posture performance scores in each phase. Similarly, the mission urgency SME ratings were computed as a sum of the 18 mission urgency performance scores in each phase.

For the SME-ratings of the force posture-decisions, Mauchly's test of sphericity was non-significant ($p > .05$). In addition, the Levene's tests were non-significant in peacetime ($F(1,100) = 3.38$, $p = .069$); wartime ($F(1,100) = 2.19$, $p = .142$); and post-conflict ($F(1,100) = 0.01$, $p = .951$).

Conversely, when checking the SME-ratings of mission urgency, Mauchly's test of sphericity was significant ($\varepsilon = .92$, $p = .003$). The Huynh–Feldt correction was thus used when calculating the variable's F-ratios. The Levene's tests were non-significant in peacetime ($F(1,100) = 3.39$, $p = .069$) and wartime ($F(1,100) = 1.34$, $p = .249$). However, in the post-conflict phase the Levene's test was significant ($F(1,100) = 6.16$, $p = .015$). To this end, a robust ANOVA test (Field & Wilcox, 2017) was conducted to investigate whether the groups' mission urgency decision-making performance differed in the post-conflict phase.

The composite scores of both SMEs were computed to calculate the intraclass correlation coefficient (ICC) on both variables. The force posture expert ratings' interrater reliability showed a very good ICC of .800 ($p < .001$). The mission urgency expert ratings' interrater reliability showed an acceptable ICC of .715 ($p < .001$).

Independent variables

The independent variables were Sector (police/military) and Phase (peace/war/post-conflict).

Statistics

The data were analyzed in statistics software Jamovi (2023) version 2.3.26 using four 2 × 3 repeated measures analysis of variance (ANOVA) tests with subsequent post-hoc Tukey tests. The alpha level of significance was set to 0.05 (5%).

The first ANOVA tested the commanders' force posture decisions, while the second looked at mission urgency. The purpose was to determine how far the independent variables were major sources of decision-making variability. The third ANOVA tested the SME ratings of force posture decision-making performance, while the fourth considered mission urgency decision-making performance. Our interest was to compare the commanders' relative performance across the phases, and whether it changed as the scenario transformed from peace to war, to post-conflict. Partial Eta Squared ($\eta_p 2$) were calculated to measure the proportion of variances attributable to the effect under consideration. The reference values for effect sizes for Partial Eta Squared are as follows: Small effect (S) = .01; medium effect (M) = .06; and large effect (L) = .14 (Maher et al., 2013). There were no missing data.

Results

Tables 1–4 present the means, standard deviations, and Pearson r correlations for the variables: force posture, mission urgency, force posture decision-making performance, and mission urgency decision-making

Table 1. Correlation matrix, force posture.

	Peacetime Posture	Wartime Posture	M	SD
Peacetime Posture	–	–	125.74	15.64
Wartime Posture	.59***	–	145.17	13.82
Post-Conflict Posture	.70***	.63***	121.10	20.02

***$p > .001$, M = Mean, SD = Standard deviation.

Table 2. Correlation matrix, mission urgency.

	Peacetime Urgency	Wartime Urgency	M	SD
Peacetime Urgency	–	–	129.22	18.66
Wartime Urgency	.74***	–	146.03	18.83
Post-Conflict Urgency	.61***	.75***	130.95	20.50

***$p > .001$, M = Mean, SD = Standard deviation.

Table 3. Correlation matrix, decision-making performance, force posture.

	Peacetime Performance Posture	Wartime Performance Posture	M	SD
Peacetime Performance Posture	–	–	24.50	3.07
Wartime Performance Posture	.27**	–	27.26	2.81
Post-Conflict Performance Posture	.30**	.13	25.71	2.89

**$p > .01$, M = Mean, SD = Standard deviation.

Table 4. Correlation matrix, decision-making performance, mission urgency.

	Peacetime Performance Urgency	Wartime Performance Urgency	M	SD
Peacetime Performance Urgency	–	–	24.54	3.55
Wartime Performance Urgency	.35***	–	25.27	2.31
Post-Conflict Performance Urgency	.41***	.40***	23.52	4.81

***$p > .001$, M = Mean, SD = Standard deviation.

performance. Correlations are reported with the degrees-of-freedom number 100.

Although the descriptive statistics and correlation coefficients illustrate the associations between variables related to the hypotheses, four ANOVA tests were necessary to determine the main effects and interaction effects of the variables in the police and military group.

Force posture

The analysis of the force posture data showed a main effect of Sector, $F(1, 100) = 5.84$, $p = .017$, $\eta_p^2 = .06$ (M), with police commanders demonstrating the most offensive posture levels in general. A main effect of Phase was also found, $F(2, 200) = 152.17$, $p < .001$, $\eta_p^2 = .60$ (L). H1a was supported by a post-hoc test indicating more offensive levels of force posture in war relative to both in peace ($p < .001$) and the post-conflict phase ($p < .001$). Contrary to H1b, the results indicated that the commanders' force posture levels were more offensive in peacetime than in post conflict ($p = .002$). The analysis also showed an interaction of Phase × Sector, $F(2, 200) = 4.27$, $p = .015$, $\eta_p^2 = .04$ (S). A post-hoc Tukey test revealed further support for H1a by describing how military commanders preferred higher levels of force posture in war than in peace ($p < .001$) and the post-conflict phase ($p < .001$). Similarly, the Tukey test showed that police commanders had increased levels of force posture in war relative to in peace ($p < .001$) and the post-conflict phase ($p < .001$).

Additionally, the Tukey test showed support for H1b in the police group, as their force posture levels did not achieve significance in comparing post conflict and peacetime. Interestingly, H1b was contradicted by the military group. The military commanders' posture levels were lower in the post-conflict phase than in peace ($p = .004$). The Tukey test also showed support for H2a by the ways in which police commanders demonstrated higher levels of force posture than military commanders in the post-conflict phase ($p = .045$), as shown in Figure 4.

Mission urgency

The second analysis explored the commanders' mission urgency decisions. The results showed a main effect of Sector, $F(1, 100) = 24.42$, $p < .001$, $\eta_p^2 = .20$ (L), with police commanders demonstrating the highest mission urgency levels. A Huynh–Feldt corrected main effect of Phase was found, $F(2, 200) = 73.47$, $p < .001$, $\eta_p^2 = .42$ (L). H1a was supported by a post-hoc test showing higher levels of urgency in war than in both peace ($p < .001$) and the post-conflict phase ($p < .001$). H1b was also supported, as the comparison of peace and post-conflict did not reach significance. The interaction of Phase × Sector was non-significant, but as explained by Wilcox (1987, p. 36), multiple-comparison procedures can be used when a hypothesis of differences exists, regardless of whether the F-test is significant.

Considering the current study's hypothesis concerning between-group differences in the transitions between peace and war, a post-hoc Tukey test was thus justified. It elaborated support for H1a by describing how both police and military commanders demonstrated higher levels of urgency in war when compared to peace ($p < .001$) and the post-conflict phase ($p < .001$). The Tukey test also supported H2a by showing that police commanders demonstrated higher levels of urgency than military commanders in peace ($p < .001$) and in the post-conflict phase ($p < .001$). Contrary to H2b, the results showed that police commanders had higher levels of urgency than military commanders in war ($p < .001$), as shown in Figure 5.

Force posture decision-making performance

The third analysis explored the SME ratings of the police and military commanders' force posture

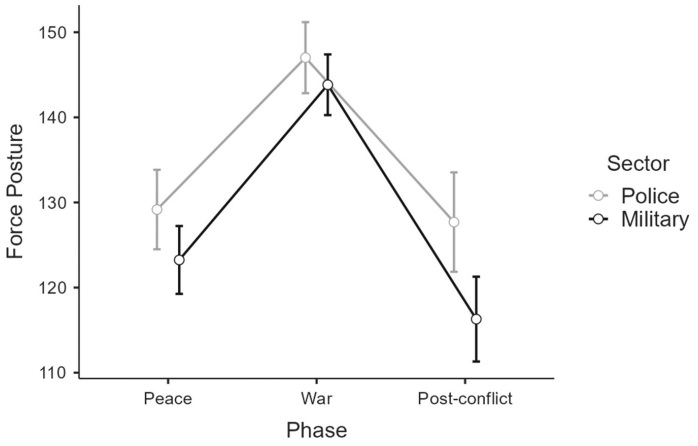

Figure 4. The commanders' force-posture levels in the three phases. Note: Error bars indicate 0.95 confidence intervals.

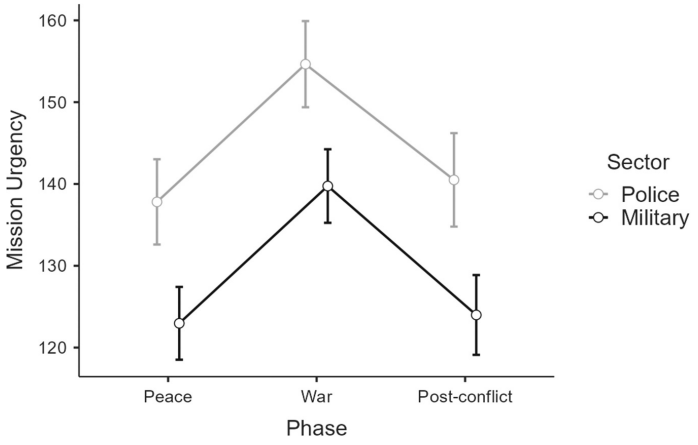

Figure 5. The commanders' mission-urgency levels in the three phases. Note: Error bars indicate 0.95 confidence intervals.

decisions (see Figure 6). The results showed a main effect of Phase, $F(2, 200) = 29.47$, $p < .001$, $\eta_p^2 = .23$ (L). A post-hoc test indicated how the commanders' wartime force-posture decisions achieved higher ratings than in peace ($p < .001$) and in the post-conflict phase ($p < .001$). On comparing the post-conflict phase with peace, the ratings were lowest in peace ($p < .001$). The analysis also showed a borderline significant main effect of Sector, $F(1, 100) = 3.84$, $p = .053$, $\eta_p^2 = .04$ (S), with military commanders achieving slightly higher ratings than police commanders. A significant interaction of Phase × Sector was not found, but since our hypothesis implied sector differences across the phases, a post-hoc Tukey test was conducted.

The Tukey test demonstrated that military commanders achieved higher ratings in war than in both peace ($p < .001$) and the post-conflict phase ($p < .001$). The SME ratings of the police commanders' decisions in war were higher than in peacetime ($p < .001$), but not in the post-conflict phase. The results also showed how police commanders achieved lower ratings in peace than in the post-conflict phase ($p = .006$). Interestingly, none of the between-group comparisons reached significance. As such, H3a was not supported; military commanders did not achieve higher decision-making performance than police commanders in wartime. Similarly, H3b was also not supported; police commanders did not

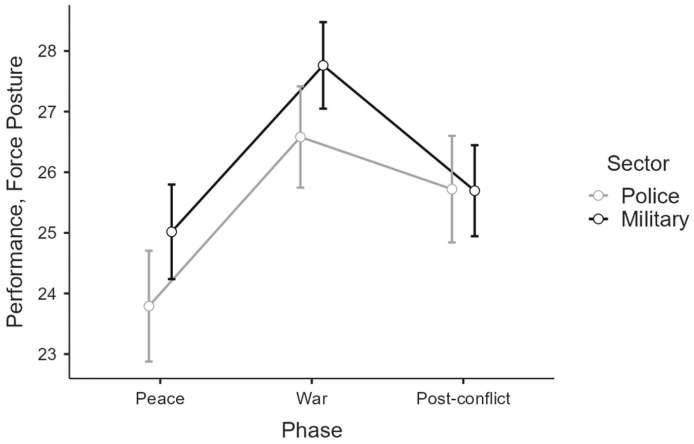

Figure 6. SME ratings of the commanders' force-posture decision-making performance in the three phases. Note. Error bars indicate 0.95 confidence intervals.

achieve higher decision-making performance than military commanders in the peace and post-conflict phase.

Mission urgency decision-making performance

The fourth analysis explored the SME ratings of the police and military commanders' mission urgency decisions (see Figure 7). The results showed a main effect of Sector, $F(1, 100) = 7.46$, $p = .007$, $\eta_p^2 = .07$ (M), indicating how the military commanders' urgency decisions generally achieved higher SME ratings across the simulation. As discussed in the methods-section, the *p*-value should be considered unreliable due to the significant Levene's test, but the partial eta squared can still be interpreted as it neither requires normality or homogeneity (Levine & Hullett, 2010).

A Huynh–Feldt corrected main effect of Phase was also found, $F(2, 200) = 10.84$, $p < .001$, $\eta_p^2 = .10$ (M). A post-hoc test indicated how the police and military commanders' mission-urgency decisions achieved higher ratings in war than in peace ($p = .036$) and the post-conflict phase ($p < .001$). The analysis also showed an interaction of Phase × Sector, $F(2, 200) = 3.86$, $p = .023$, $\eta_p^2 = .04$ (S). A post-hoc Tukey test showed a borderline significant interaction ($p = .061$)

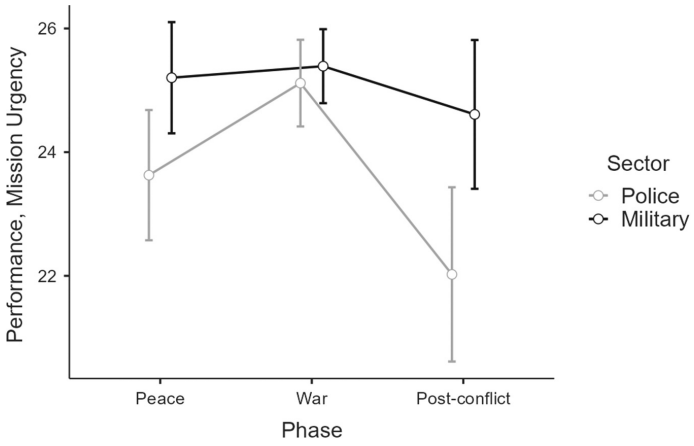

Figure 7. SME ratings of the commanders' mission-urgency decision-making performance in the three phases. Note. Error bars indicate 0.95 confidence intervals.

suggesting that the police commanders achieved higher ratings in war than in peacetime. Additionally, the Tukey test indicated that police commanders achieved lower ratings in the post-conflict phase than in war ($p < .001$).

The between-group comparisons showed no support for either H3a or H3b. However, a borderline significant interaction ($p = .071$) supported by a significant ($p = .023$) robust ANOVA test suggests that the military commanders achieved higher SME-ratings than the police in the post-conflict phase. Although low in magnitude, this result could be interpreted as partly contradicting H3b.

Discussion

The current study's aim was to gain new knowledge about the actions of police and military commanders engaged in decision-making regarding force posture and mission urgency in the context of hybrid warfare. The following hypotheses were raised from the above stated problems. H1a: Transitioning from peace to war will result in increased levels of force posture and mission urgency in both the police and military groups. H1b: The force posture and mission urgency decisions of both groups will return to peacetime levels in the post-conflict phase. H2a: Police commanders will demonstrate more offensive and urgent decision making in the peace and post-conflict phase when compared to military commanders. H2b: Military commanders will demonstrate more offensive actions and greater urgencies in times of war when compared to police commanders. H3a: Military commanders will demonstrate higher decision-making performance than police commanders in wartime. H3b: Police commanders will demonstrate higher decision-making performance than military commanders in the peace and post-conflict phase.

The analysis showed that the phase transition from peace to war made both police and military commanders demonstrate higher levels of force posture and mission-urgency decision making, which supported H1a. The strength of the relationship between escalation and decision making can be considered to have practical significance, because the main effects' size was large for both posture ($\eta_p^2 = .60$) and urgency ($\eta_p^2 = .42$). In addition, given that all respondents were high-ranking commanders, and the scenario closely resembled real-life security challenges, this finding strongly indicates that crisis escalation not only increased the commanders' preferences toward offensive action, but also their sense of urgency. It shows how a contextual shift in reference point from peace to war fundamentally altered the decision making of police and military commanders.

One possible explanation is that the commanders interpreted the escalatory transition to war as inconsistent with strategic aims, triggering cognitive discrepancies between preexisting beliefs and current performance. SCT explains how this will motivate behavior based on anticipatory estimations of what is required to resolve the perceived discrepancy (Bandura, 1999, p. 176). This self-mobilizing mechanism may involve evoking directional motivations toward expending more resources on attempts to regain control. In this view, the present finding strongly illustrates how this self-referent mechanism came into play, as both the police and military commanders were more likely to act aggressively after transitioning to war, consequently raising the probability of further escalation. Furthermore, this elaborates studies showing that government officials are influenced by the same psychological processes as novices (Sheffer et al., 2018) and supports scholars who argue that urgent and offensive action will be favored over holding back when crises escalate and war is seen as inevitable (Jervis, 2017, p. 222).

In contrast, the transition from war to post-conflict resulted in differential decision making. However, the between-group findings cannot be considered very strong, because the interaction effects' strength was low for posture ($\eta_p^2 = .04$) and very low for urgency ($\eta_p^2 = <.01$). Even so, the analysis showed that the police commanders' decisions regarding both force posture and mission urgency returned to peacetime levels in the post-conflict phase, which supported H1b. This finding may reflect that the police commanders perceived few disparities between the peace and post-conflict phases. If so, SCT explains that the police commanders would mobilize less effort toward engaging new concepts and, as a result, would be more resistant to change (Bandura, 1999). Interestingly, military commanders showed the same tendency regarding mission urgency but not force posture. Here, the data described how military commanders were more defensive in post-conflict than in the initial peace condition, which contradicted H1b. This finding may indicate that events which the police interpreted as warranting offensive action in de-escalating scenarios were seen as unnecessary use of force by the military. As such, the finding shows how police commanders renormalized their anticipatory estimations faster than the military commanders, when recovering from security crises. This helps explain why some commanders will strive for a return to familiar conditions, while others will move

beyond and think on the margins in crises. The realization is then that these mechanisms need to be understood to enable a certain degree of improvisation and flexibility in collaborative efforts.

The mixed support for H1b supports previous research showing how change often results in differential responses by the same individual, depending on the regulatory strategies they choose to interpret new events (Bandura, 1999). In this context, a possible explanation for why police commanders returned to peacetime levels, while the military commanders were more defensive in the post-conflict phase than in peacetime, is that the commanders' cognitive readiness (Grier, 2012) and preexisting beliefs had varying levels of robustness. This explains how the subsequent selective interpretations of events would have provided them with a mix of pros and cons that motivated behavior in divergent directions.

The police commanders' tendency to renormalize their reference point illustrates the psychological necessity of making assumptions in line with previous experience (Elstein et al., 1990). This may have undermined the police commanders' willingness to choose untried and untested courses of action in de-escalating contexts. In contrast, military commanders seemed less fixated on peacetime reference points when making decisions in the post-conflict phase. Although the result points to the potential effect of changing threat conditions, critics argue that biased assessments due to change are much rarer than commonly supposed (Guess & Coppock, 2020) and that shifts from moderate to more extreme positions are an infrequent outcome when people are exposed to uncertainty (Kuhn & Lao, 1996). Even so, the current findings illustrate important sector differences in the ways commanders made differential tradeoffs between adaptation and pursuing preexisting beliefs in de-escalating circumstances. To this end, our result reflects the general coordination problems observed in Norwegian crisis preparedness (Rykkja & Lægreid, 2014) and how the present sector-based organization may lead to an increase in sunk costs to organizational norms, further raising the threshold for implementing more transformational solutions (Marchau et al., 2019, p. 503).

It is possible that the military commanders' formal training in peacekeeping and previous experience from international operations is the explanation for why they adapted differently than the police commanders in the post-conflict phase. As explained by Klein (2017), the military commanders' domain-specific skills would have given them a greater ability than police commanders to differentiate the peace and post-conflict phase, either through previous experience or through deliberate calculations. When this line of reasoning is applied to the police commanders' undifferentiated decision making across the same conditions, it is possible that it represents how policing in post-conflict scenarios was interpreted according to the police sector's peacetime norms. As such, the conditions of post conflict seem to have been below the police commanders' threshold for adaptation.

From these findings, it follows how reliance on preexisting beliefs can result in differential decision making that complicates the implementation of alternative concepts even amid ongoing crises. Thus, the analysis reveals a somewhat surprising pattern. The transition from peace to war clearly generated more offensive actions and greater urgency for everyone, while the transition from war to post-conflict created differential decision making. From a social cognitive perspective, this shows that even if justifications for change are evident, there may be insufficient feedback to motivate a search for alternative actions, as might be the case for the police commanders. On the other hand, SCT (McCormick, 2001) also explains how the challenges of uncertainty can be resolved if events are perceived as supporting new strategies, as might be the case for the military commanders. This finding elaborates previous studies describing the decision-making difficulties presented by modern conflicts (Shortland et al., 2019) and how transboundary threats complicate cross-sectoral collaboration (Sarapuu et al., 2014).

The study's other hypotheses also warrant discussion. For example, the Sector variable's substantial effect size (large for urgency; $\eta_p^2 = .20$ and medium for posture; $\eta_p^2 = .06$) constitutes a reason to reflect on its real-world implications. The data showed that police commanders demonstrated more offensive postures, as well as greater urgencies, than military commanders in the peace and post-conflict phases, which supported H2a. On the one hand, this indicates how the police commanders were optimistic about the relevance of their previous experience in both peacetime and post conflict. On the other hand, it may show that military commanders considered that holding peacetime events as reference points for decision making in post conflict would yield less utility than adopting more restrictive approaches. As this effect was not found among the police commanders, this finding shows how the transition from war to post-conflict impacted police and military commanders differently. Moreover, it supports the ways SCT explains that exercising control in unfamiliar situations is not just a matter of gaining predictive knowledge, but of gaining the self-assurance necessary to act decisively (Bandura, 1997). The commanders' efficacy beliefs may thus be useful to better understand the demonstrated sector differences.

Interestingly, while the police commanders returned fully to peacetime posture levels in the post-conflict phase, the military commanders' force postures were significantly lower across the same condition. This appears to be an adaptability type of effect (i.e., events in post-conflict seem to have been below a response threshold according to previous military experience). As shown by Dettaff et al. (2020, p. 88), previous experience and organizational norms function as subjective criteria that must be exceeded if judgments are to evolve into actions. The post-conflict condition seems to have represented a sub-threshold stimulus for the military commanders, resulting in behavioral adjustments dissimilar to those previously conducted in peacetime and war. In parallel, military commanders did not demonstrate more offensive postures than police commanders in wartime, which did not support H2b. The data also showed that police commanders had higher levels of urgency than military commanders in war, which was contrary to H2b.

The mixed within-group effects seem to illustrate how police and military commanders felt dissimilar pressures to be offensive and act urgently across the simulation. The twist of this finding reinforces SCT's prediction that the impact of change on behavior depends on the decision-makers' self-referent retrospective reasoning and forethoughts about the relationship between ongoing events and future actions (Bandura, 1999).

The implications of these psychological findings are several. First, they explain why behavioral outcomes in security crises may be as much the product of the ways decision-makers think as a result of an event's objective incentives (Jervis, 2017). Secondly, they elaborate why the police and military's operational environment has both discrepancies and commonalities (Penney et al., 2022) and why it is premature to conclude that sector differences will correspond across change. Thirdly, the results seem to expand the arguments of scholars claiming that police commanders are predisposed toward rapid responses (Crank, 2015; Myhrer, 2015). To the extent that this makes withdrawal difficult, police commanders may be less aware of how urgent actions entail a high chance of escalation and that holding back can be advantageous for crisis stability in hybrid attacks. None of this is to say that military commanders are more aware of change and less likely to engage in unwarranted actions. As shown by Vallée-Tourangeau et al. (2011), falling back on previous experience can allow decision-makers to make feasible decisions, but in other instances can make it difficult to think of new ways of solving problems. In this context, the differential outcomes between police and military commanders shown in the present study expand the area of naturalistic decision making (Mosier et al., 2018) and support SCT's predictions that self-referent thinking is a critical ability responsible for regulating decision-making behavior in organizational settings (Stajkovic & Sergent, 2019, p. 10). Thus, a more detailed analysis of the ways these cognitive tendencies are manifested in other public sectors may potentially be important, and further empirical studies should investigate this in detail.

The study's final findings of note regard the SME ratings of the commanders' decision-making performance. Firstly, the analysis demonstrated that decision-making performance was highest in wartime. This is an important finding that is backed by a strong effect size for both posture ($\eta_p^2 = .23$) and urgency ($\eta_p^2 = .10$). It expands recent studies arguing how hybrid attacks taking place below the threshold of war complicate decision making (Cullen & Reichborn-Kjennerud, 2017, p. 31). Interestingly, previous studies have both demonstrated (Levi & Tetlock, 1980) and contradicted (Suedfeld & Bluck, 1988) that decision-making performance tends to decline in war.

Secondly, no significant differences were found in the police and military commanders' decision-making performance in wartime, which did not support H3a. Similarly, no significant differences were found when analyzing the commanders' decision-making performance in peace and post conflict, which did not support H3b. However, the expert ratings of mission urgency showed a borderline significant effect ($p = .071$) with a medium effect size ($\eta_p^2 = .07$) that were supported by a significant robust ANOVA test ($p = .023$) in the post-conflict condition. Although not very large, the result suggests that police commanders somehow failed to revisit their assessments adequately when the scenario changed. This complements the above finding about divergent urgency levels in post conflict (H2a) and illustrates how the self-referent anchoring mechanisms of police and military commanders created slightly divergent behavioral adjustments after transitioning to post-conflict. Even so, one should be careful to draw any conclusions about the relatively cognitive readiness of the commanders. The results cannot support the idea that either the police or the military should unilaterally lead the way in operations to counter hybrid warfare. However, they support previous research asserting the importance of interagency approaches (Bynander & Nohrstedt, 2019) and advance our understanding of hybrid warfare by describing some of the unique decision-making challenges it creates in collaborative crisis management.

Thirdly, the qualitative differences illustrated by the expert ratings support research demonstrating how the ability to regulate behavior in response to changing conditions is an important ability (Joseph & Ocasio, 2012; Laureiro-Martínez & Brusoni, 2018) to manage the cognitive shifts (Foldy et al., 2008) needed for efficient exploration of options in uncertain circumstances (Marcel et al., 2011). As argued by Klein (2011, p. 5), this implies that decision-makers must recognize when preexisting beliefs are valid, while maintaining the ability to acknowledge when improvisation is needed. The current analysis found that the commanders' decision making was not random but was based on anticipatory thinking derived from domain-specific occupational knowledge. We believe that this provides powerful evidence that the commanders' actions were largely a product of the self-referent mechanisms described by SCT (Bandura, 1986).

Limitations

The present empirical analysis of decision making in hybrid attacks may have important implications for future crisis management efforts but is not without limitations. Although both groups showed increased levels of offensiveness in wartime, the analysis did not indicate that the transition from peace to war impacted the police and military commanders differently (i.e., the analysis did not indicate that the parameters increased unequally in the transition to war). As such, the severity of war seems to have activated a set of shared beliefs that are common to both the police and military in wartime conditions. Another possible reason for the lack of findings in the war phase is that the choice of statistical tests was suboptimal, or the simulation may have been insufficient to identify sector differences. Alternatively, the force posture measurement may not have captured actual predisposition toward offensive actions in wartime. For example, the study measured the commanders' force posture decisions on a defensive-offensive scale, which says little about the actual use of force. Future research should thus consider investigating the corresponding coordinating instructions (i.e., the order of actions, planned formations, and control measures that pertained to each mission).

Regarding the SME ratings, we developed a scale to assess the commanders' decision-making performance. However, we acknowledge that the scale did not follow a traditional construction process and that the analysis cannot explain the lack of differential group effects, although one finding was borderline significant, with a medium effect size. Even though the scale allowed the commanders to adjust their decisions in ways that are relevant when conducting operations, the lack of support for H3a and H3b could suggest that the scale had too low resolution (i.e., only three levels), or that our choice of task elements should have included other elements (i.e., the information aspect). This could have resulted in further explanations but was excluded due to our choice of statistical tests and study design. Based on these findings, we recommend future studies to maintain the current decision elements (force posture and mission urgency) but suggest constructing a scale in accordance with validated psychological-scale concepts.

Although the current study measured the commanders' regulation of force posture and mission urgency, it did not fully assess the specific variables related to SCT (i.e., self-efficacy). As such, continued investigation of the self-regulatory mechanisms proposed by SCT would add to our understanding of the nuances between the present simulation and previous research of the impact of self-referent thinking on decision making. As asserted by recent studies, future research should investigate how multiple individuals (Gore et al., 2018) and collective efficacy (Krammer et al., 2018) can explain the decision making of command teams across changing conditions.

Conclusion

This study's main result describes how both police and military commanders demonstrated more offensive postures and higher levels of urgency in wartime than in otherwise similar tasks in times of peace and post-conflict. Furthermore, the analysis showed significant-sector differences in the ways police and military commanders adjusted their preferences to change, and as a result, how their decision-making efficacy varied. It not only demonstrates the varying robustness of the commanders' preexisting beliefs but also that sectoral affiliation had a strong impact on the ways decisions were made. These findings clearly illustrate how and why some operational solutions proved more psychologically appealing than others. In this context, the current study expands previous research on the behavior of professionals (Hoffman et al., 2013; Schraagen et al., 2008; Shortland et al., 2019) and sheds light on how the interactions of sectors with distinct types of preferences may account for decision-making outcomes that impair performance.

Combined with the theoretically justified predictions of SCT (Bandura, 2018), the analysis points to some important challenges and helps understand why the psychological effects of phase transitions are central for understanding new and emerging security threats. We believe these findings can help improve the police-military dialogue and make a difference in improving

interoperability and reducing risk in collaborative efforts. Extending this research to other governmental sectors would be particularly valuable because, unlike the hybrid attacks explored here, most crises do not entail security threats. However, these crises (i.e., natural disasters, financial crises, organizational crises) are far more prevalent and equally consequential for the individuals and organizations involved.

Notes

1. Force posture involved the commanders' intent regarding the use of force in operations. It was not a limitation but provided subordinate forces with an understanding of the expected readiness of force elements, the type of methods that were suitable and how much risk the commander accepted. For example, defensive postures indicated that the goal was to de-escalate the situation. Conversely, offensive postures meant that the force could take the initiative and that escalation was acceptable.
2. Mission urgency involved the commanders' intent regarding the expected time from when a force received orders to conduct a given mission to the time movement was initiated. It included the time for planning, order briefings, and necessary preparations to familiarize capabilities, connect commands, and integrate combat support.

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All data, analysis code, and research materials are made available to experts in the field with explicit permission from the Norwegian Defense University College by contacting the authors at, jomattingsdal@mil.no.

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From peacetime to war: a path analysis of the factors that predict performance among police and military commanders in collaborative crisis response

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Purpose: This study aimed to examine the applicability of Bandura's social cognitive theory in predicting organizational performance in dynamic and ambiguous hybrid warfare contexts. Specifically, the study investigated the influence of dyad composition, past performance in peacetime, collective self-efficacy, and persistence on wartime performance among high-ranking police and military commanders.

Study design/methodology/approach: One hundred and thirty-eight participants, consisting of police and military commanders, took part in a simulation exercise that escalated from peace to war. The participants were assigned to three types of dyads (N = 69); all-police (n = 20), all-military (n = 27), and mixed police-military (n = 22). The study utilized path analysis to examine the direct and indirect effects of the variables on wartime performance.

Results: The model developed in this study accounted for 54% of the variance in wartime performance (R^2 = 0.54). Path analysis showed direct effects of persistence (β = −0.33) and peacetime performance (β = 0.45) on actual performance in wartime. Direct effects also showed how persistence was predicted by dyad composition (β = −0.24) and peacetime performance (β = −0.50). Indirect effects indicated how persistence mediated the effects of peacetime performance (β = 0.17) and dyad composition (β = 0.08) on actual performance in wartime.

Originality/value: This study contributes to the understanding of how social cognitive factors, as described by Bandura's theory, can predict decision outcomes in collaborative crisis response settings involving police and military commanders. The findings have implications for policy-making and provide recommendations for further research in this area.

KEYWORDS

hybrid warfare, decision-making, collaborative crisis response, organizational performance, persistence, collective self-efficacy, police-military interoperability

Introduction

A matter of increasing concern is how the ambiguous threats of hybrid warfare,[1] which are hard to comprehend, let alone counter, challenge the police and military's ability to collaborate in security crises (Wrange, 2022). As the need for more efficacious crisis response systems is growing, the present article investigates the organizational performance of police and military commanders from the perspective of social cognitive theory (SCT) of Bandura (1999). As used herein, organizational performance refers to the activities commanders engage in while allocating troops to tasks and adapting to change in available resources and situational circumstances (Mintzberg, 1989).

Given SCT's grounding in the social environment, it can explain organizational functioning at both the individual and group level (Stajkovic and Sergent, 2019, p. 11). SCT provides detailed descriptions of how people's behaviors and personal circumstances interact with the environment to influence each other through reciprocal determinism (p. 1). In this conceptualization, people are active information seekers that strive for control of matters of perceived importance to achieve desired outcomes. SCT further explains how people make decisions by forming expectations about the anticipated outcomes of actions, by self-reflectively accessing and processing information. Group interactions are thus contingent on the accumulated knowledge and domain-specific skills of those involved (p. 4). Of particular note is how Bandura (1986, p. 394) predicts that the outcomes of these mechanisms may manifest themselves differently in the ways people persist in the face of ambiguity and setbacks. As used herein, persistence refers to the extent to which people mobilize resources and expend efforts in the face of difficulties (Bandura, 1997, p. 76).

In ambiguous conditions, SCT (Wood and Bandura, 1989) defines three features that determine the performance of people working together in the management of organizations: (a) Their selective assessments of the bigger picture and long-term considerations derived from previous experience; (b) Their ability to make the most of their resources while adhering to personal standards and organizational norms; and (c) Their self-regulatory ability to innovate, improvise, and adapt to rapidly changing circumstances. In the current study, we thus believed SCT would be instructive for analyzing the reciprocal relationships between the behaviors and personal factors of high-ranking commanders and the contextual factors of hybrid warfare.

Background

Many scholars report how self-regulation determines the degree to which people invest in tasks, and how this in turn predicts work-related performance in a number of professional domains (Stajkovic and Luthans, 1998), including rescue work (Prati et al., 2010), nursing (Pham et al., 2019), education (Martin et al., 2009), leadership (McCormick, 2001), business (Nwosu et al., 2022), and teamwork (Staples and Webster, 2007). However, relatively little is known about the processes predicting the organizational performance of governmental officials (Jervis, 2017, p. xvi). Even less is known about the variables linked to organizational performance when several security providers cooperate in the management of hybrid warfare (Caliskan and Liégeois, 2021). On this account, Bandura (1999) posits that the contrasting backgrounds and previous experience of professionals having equal expertise, but distinct standards of adequacy, would play prominent roles when they have to make decisions without fully knowing the extent to which a course of action is justified. As used herein, decision-making refers to the process explaining how group members without conflicts of interest, but with problems of ambiguity, use their domain-specific skills to size up events, form expectancies, determine the reasonable cues and goals, and identify a response and carry it out (Klein, 2017).

To address the organizational performance of police-military command dyads engaged in collaborative crisis response regarding hybrid warfare, we thus evaluate the influence of two fixed social cognitive factors (dyad composition and past performance in peacetime) and two relatively pliable factors (collective self-efficacy and persistence) on organizational performance in wartime. Although Bandura (1997) predicts that these factors are linked to organizational performance, scholars assert that there is still substantial overlap between the concepts, which calls for contextual adaptations (Schunk and DiBenedetto, 2021). For example, research describes how SCT explains group performance in manufacturing (Little and Madigan, 1997), teaching (Goddard et al., 2004), and business (Kim and Shin, 2015). On the other hand, studies have also demonstrated conflicting conclusions concerning the influence of both efficacy beliefs and past performance on actual performance (Heggestad and Kanfer, 2005). However, scholars have thus far not examined the role played by social cognitive factors in explaining organizational performance in war.

To focus our study, the analysis was limited to command dyads at a national headquarters, as this setting not only includes the vicarious management of ongoing events, but also the planning of future actions (Mintzberg, 1989). Dyads are groups of two (Graen and Scandura, 1987) and were used in the current study because dyads can operate under the same principles and theories that explain group processes for groups of three and larger groups (Williams, 2010). Furthermore, our approach follows research encouraging social cognitive investigations in field settings (Schunk and Usher, 2019) and the performance of groups involving people with complementary competencies (Ochoa et al., 2007).

As we focus on the social cognitive factors predicting organizational performance, we believe the potential serious consequences of hybrid attacks on Norway (Diesen, 2018), and the Norwegian police and military's reputation for acting cooperatively (Spurkland, 2021), make it possible to assume mutual confidence between the current study's participants. In this regard, we firmly

1 In the report of Cullen and Reichborn-Kjennerud (2017), hybrid warfare is defined as the synchronized use of multiple instruments of power tailored to specific vulnerabilities across the full spectrum of societal functions, to achieve synergistic effects. The report asserts that hybrid warfare is a widespread approach that is likely to grow as a security challenge, justifying new efforts by nations to understand the threat it presents.

believe that comprehending the specific Western[2] context of the interactions between Norwegian police and military commanders carries substantial significance for various reasons. These reasons encompass the imperative for individuals occupying positions of authority to adopt strategies in accordance with the prevailing institutional frameworks inherent in open societies. Furthermore, fostering interagency cooperation that strictly adheres to the principles of the rule of law, ensuring transparency, and aligning response measures with the priorities and standards set by the public is of utmost importance (Arneson, 2009). Consequently, by following these democratic principles, it should become possible for police and military commanders to effectively counter hybrid warfare while upholding the ethical expectations of the public and avoiding potential transgressions.

Although the interdependence and mutual aims of police and military commanders in western countries are close enough to consider them a team (Salas et al., 2008), SCT predicts between group decision-making differences as the demands of specific standards and the constraints of ambiguity will assure that different combinations of self-regulatory mechanisms are activated in the face of hybrid warfare. As a result, the properties of choice alternatives will evoke little or much motivation, depending on how a course of action is perceived as useful for achieving desirable outcomes (Bandura, 1999, p. 171).

To this end, we asked the following questions: (1) How does the dyads' composition, collective self-efficacy, and past performance in peacetime predict their actual performance in wartime? (2) What is the relationship between the dyad's level of persistence and their performance in wartime? To answer these questions, we used an original data set collected from a simulation involving 138 high-ranking commanders from all branches of the military, and nine out of 12 Norwegian police districts.

Related work on decision-making in collaborative crisis response

A review of the scholarly discourse reveals the importance of organizational differences, previous experience, and adaptive self-regulation for understanding decision-making in collaborative efforts (Mosier et al., 2018; Usher and Weidner, 2018). Research of policing (Herrington and Colvin, 2015), military operations (Gray, 2015), and interagency operations (Schedler and Kuipers, 2022) supports how personal factors relate to the skillful management of resources across time and space, regardless of who is in charge and who is supporting the accomplishment of tasks (Floyd, 2021). This highlights the paramount significance of understanding the individual decision-makers occupying higher levels of leadership. However, scholars assert that little empirical work is written about the decisions of high-ranking commanders in wartime (Shortland et al., 2019).

On this note, scholars of hybrid warfare discuss how crisis response systems based on highly sectorized decision-making will be challenged when the resources of several sectors are overwhelmed by the number and severity of threats (Weissmann et al., 2021). Nowhere is this more evident than in the 22 July Norway attacks, in which the government failed to mobilize resources that would have been critical if there had been more attacks that day (Gjørv et al., 2012). Similar obstacles to efficient decision-making are exemplified in other hybrid warfare induced security crises, such as the ongoing war in Ukraine involving private military companies (Østensen and Bukkvoll, 2022) and separatist groups supported by Russia (Freedman, 2019). The multifaceted conflict in Syria is another illustrative example, combining conventional and unconventional tactics (Bachmann and Jones, 2021). Additionally, there have been instances of flawed police-military interactions, accompanied by subsequent erratic decision-making regarding hybrid attacks on Israel (Matthews, 2011). These events collectively exemplify an ambiguous decision environment characterized by the involvement of multiple actors, the blending of diverse methods, transboundary implications, information warfare, the necessity for interagency coordination, and the potential for escalation, requiring decision-makers to make timely and prompt decisions.

In the wake of the emergence of hybrid warfare, it has been two recurring debates related to decision-making in collaborative crisis response. The first debate concerns the ambiguous nature of the contemporary security environment (Huddy et al., 2023), wherein hybrid warfare appear as a particularly formidable challenge for decision-makers within the government (Mumford and Carlucci, 2022). This form of warfare introduces substantial risks of excessive crisis escalation among the involved parties (Cullen and Reichborn-Kjennerud, 2017) and is compounded by the heightened accessibility of weapons of mass destruction and the associated challenges they present (Okoro and Oluka, 2019). The second debate concerns how pre-existing decision-making frameworks often yield poor organizational performance in situations that are difficult to predict and anticipate (Marchau et al., 2019). Moreover, these issues are amplified by the growing phenomenon of police militarization (Kraska, 2021) and the blurred boundaries between internal and external security in Western countries (van Vark, 2021), as well as the difficulties of applying traditional rules of engagement to hybrid warfare scenarios (Schmitt et al., 2022).

The ambiguous decision-making environment inherent to hybrid warfare seems especially pertinent in the interface of police and military commanders. Within this domain, their distinct sector-specific responsibilities play a crucial role in governing the support and leadership of collaborative efforts (Thiele, 2021). Both police and military commanders are trained to respond swiftly to crises, through established command and control systems, communication networks, and operational procedures they can activate when needed (Lægreid and Rykkja, 2018). This readiness allows both groups to mobilize resources, deploy personnel, and coordinate response efforts in a timely and coordinated manner. However, as argued by Corbe and Cusumano (2018), their overlapping capabilities also introduce difficulties in coordinating and aligning police-military efforts to effectively address challenges that require collaboration (see Larsson et al. (2023) for an overview of arguments on the social-psychological

2 The term "Western countries" refers to nations that are typically located in North America, Western Europe, and other regions where Western cultural, political, and economic influences are prevalent. These countries often share similar democratic systems, values, and institutions (McNeill, 1997). While the specific list of countries considered "Western" may vary depending on the context, examples generally include the United States, United Kingdom, Germany, Norway, and other countries within Western Europe and North America.

aspects of civil-military interagency collaboration). Thus, in the current study, we believed that investigating the predictors of performance based on SCT was a crucial first step to test the asserted relationship between interagency collaborations and the resilience of modern societies.

The current study's rationale is thus inevitably based on the identified deficiencies in the crisis response system of countries such as Norway (Gjørv et al., 2012), Germany (Fleisher, 2014), the United Kingdom (Murphy, 2006), and the United States (Hoffman et al., 2015). Moreover, it takes into account the challenges arising from the distinct and specialized boundaries between the police and military (Auglend, 2016), as well as the increasing vulnerabilities faced by modern societies in general (Larssen, 2021). With this in mind, the primary objective of the current study was to foster enhanced understanding of how police and military commanders can effectively address the challenges posed by hybrid warfare.

Hypothesis

Dyad composition

Research of public administration (Lee and Hung, 2021) and collaborative crisis management (Bynander and Nohrstedt, 2019) asserts that group composition influences performance attainment when public organizations cope with unexpected events under the same resource constraints and mandates that make up their daily routines. Furthermore, research of hybrid warfare suggests that interagency groups, based on members from the police, military, and other governmental and non-governmental security providers, promote operational flexibility that is beneficial for countering hybrid warfare (Tagarev, 2021). Yet researchers studying how professionals make decisions (Schneider and Shanteau, 2003) have rarely taken social cognitive factors into consideration when addressing the influence of group composition on performance in security crises. The effect of unilateral or interagency grouping in higher-level headquarters thus remains unknown. To address this issue, the current study explores the effects of dyad composition (i.e., all-police, all-military, or mixed police-military) on organizational performance in wartime. The following hypothesis was thus put forward:

> *Hypothesis 1: Interagency grouping will enhance organizational performance both directly and indirectly by effecting persistence.*

Past performance in peacetime

According to Bandura (1986), when commanders manage threats occurring in the ambiguous gray zone between peace and war, they will rely heavily on their previous experience from peacetime to determine which courses of action they prefer. The central question here is the unique contributions of the dyads' peacetime performance to their actual performance in wartime. As such, positive effects in the past performance/actual performance relationship are reported in fields such as teamwork (Margarida Passos and Caetano, 2005), education (Elias and MacDonald, 2007), sports (Jackson et al., 2020), and project management (Zarghami and Zwikael, 2022). However, Bandura and Jourden (1991) explain that such influences of past performance on actual performance are likely to decrease over time. It is important to note that this effect has only been demonstrated in conditions of low ambiguity (Schmidt and DeShon, 2010). Based on this, we reasoned that since hybrid warfare is characterized by high levels of ambiguity, the dyads' performance in peacetime should play an important role in determining how efforts are mobilized in war. The following hypothesis was thus put forward:

> *Hypothesis 2: High levels of peacetime performance will enhance organizational performance in wartime both directly and indirectly by effecting persistence.*

Collective self-efficacy and performance

According to Bandura (1997), collective self-efficacy is a motivational construct explaining how a group's confidence in its abilities is associated with greater success, so that higher collective self-efficacy leads to better group performance. The relation between collective self-efficacy and group performance is considered robust (Gibson et al., 2000), and strong correlations have been demonstrated in recent meta-analysis (Stajkovic et al., 2009). In the current study, dyads having strong beliefs about their power to produce intended results and effect change through collective action should therefore demonstrate high performance levels. The following hypothesis was thus put forward:

> *Hypothesis 3: A strong sense of collective self-efficacy will enhance organizational performance both directly and indirectly by effecting persistence.*

Persistence and performance

Social cognitive theory (SCT; Bandura, 1986) describes how people whose standards encourage hard work and persistence should expend more resources in the face of difficulties and consequently be more efficacious than less persistent individuals. Similarly, people with standards that encourage collaboration should be more likely to do so, compared with those who lack previous experience from successful collaborative efforts. Accordingly, commanders who feel competent about overseeing collaborative efforts should persist and mobilize efforts in ways that minimize resource requirements and mitigate risks to friendly actions. Thus, if subordinates report threats, this will substantiate people's perceptions of progress and motivate the necessary resource allocations (Schunk and DiBenedetto, 2021, p. 155). For such reasons, scholars argue that organizational performance in times of war relies on prudent decisions more than inflexible tenacity (Gray, 2010). In a Norwegian context, the reckless use of force is not only a waste of resources, but also involves risks of excessive escalation. If so, overly persistent efforts and excessive use of force should result in lower performance attainment. Indeed, the relationship between persistence and performance could be argued to be inversely related in such settings.

The ways in which commanders at headquarters need to align tactical actions with national objectives, while managing limited resources (Olsen and Van Creveld, 2010), thus provide an interesting target for testing the predictions of SCT. The extent to which the commanders' persistence impacts organizational performance in wartime has not yet been investigated, but in accordance with the SCT predictions, we expected that it would play a significant role. The following hypothesis was thus put forward:

Hypothesis 4: Elevated levels of persistence will reduce the level of organizational performance in wartime.

Methods

Participants

The 138 participants (men/women = 118/20, police/military = 62/76) were balanced by age/seniority and assigned to one of three dyad conditions: (1) Mixed police-military ($n = 22$), all-police ($n = 20$), and all-military ($n = 27$), $N = 69$.

The military participants were drawn from all branches, including the joint headquarters, with ranks ranging from captain to major-general or the equivalent. The police participants were drawn from the police districts and police directorate, with ranks ranging from inspector to assistant chief of police.

All participants had previous leadership experience and an average of 20.19 years of active-duty service, with a standard deviation (SD) of 8.0 years. The average age of the participants was 43.0 years (SD = 7.9).

In the mixed police-military dyads, the average age was 43.8 years (SD = 8.0), while in the all-police dyads it was 44.1 years (SD = 7.9), and in the all-military dyads 41.1 years (SD = 7.7).

Instruments and variables

The simulation was conducted at a virtual national headquarters using a video conferencing program (i.e., Microsoft Teams) via the secure VPN connections of the Norwegian police and military. The use of video conferencing in both research (Gray et al., 2020) and crisis management (Chandler and Wallace, 2009) is well-documented and is frequently used by government agencies to coordinate activities, due to its security options and cost-effectiveness. We thus reasoned that the simulation's video conferencing was a close approximation of the actual decision-making environment of commanders at national headquarters.

The researcher took part in the video conference, to initiate and observe the study. Computer software (Microsoft Forms) controlled the sequence of the slides and recorded all the respondents' decisions. No time limit was assigned to the simulation. The average time to complete was 106.23 min (about 2 h). *Scenario*: To simulate the ambiguous nature of hybrid warfare (Weissmann et al., 2021), the scenario involved tasks that traversed the traditional responsibilities of police and military commanders. These tasks encompassed diverse responsibilities aimed at safeguarding national security and public safety. They included conducting counterintelligence and counterterrorism operations, promptly responding to emergency situations, collecting and analyzing intelligence, ensuring the safety of hostages or individuals affected by crises, safeguarding critical infrastructure, and maintaining border integrity to prevent illicit activities.

Geographically, the scenario's threats targeted Norway's critical infrastructure in an arc from Svalbard in the north to Skagerrak in the south, constituting a major security crisis. To ensure that the simulation included the strategic dilemmas of new and emerging security threats, the current scenario was based on NATO's Occasus exercise module (Derksen, 2018). Events were described by realistic intelligence products, such as assessments of the adversaries' capabilities, friendly forces information, geospatial data, and civil considerations.

To reflect the temporal effects in actual crises, the scenario involved a total of 36 trials, of which each trial concerned hybrid attacks attributable to a hostile state (see Figure 1) that openly opposed the interests of Norway. Each trial was represented by a mission that required action from the participants. All trials involved ambiguity and required different capabilities in areas such as policing, surveillance, close protection, security assistance, high-risk arrests, and direct action. These mission categories represent the types of methods an affected state might utilize when confronting hybrid warfare (Monaghan, 2019).

The first 12 trials represented the peacetime condition, in which a combination of state and non-state adversaries engaged in criminal and irregular activities below the threshold of war. The next 24 trials represented the wartime condition, in which the attacks intensified to include combat actions short of full-scale war, but not sufficiently to invoke Article 5 of the NATO Treaty.

Exogenous variables

Dyad composition

Dyad composition was coded as an ordinal variable based on the implied order of the dyads' crisis response capabilities (refer to Table 1). As interagency approaches are advocated to counter hybrid warfare (Yanakiev, 2018), we expected that dyads comprising both police and military personnel would demonstrate the highest organizational performance. The mixed police-military dyads were thus ranked in first position. Furthermore, since the police have the leading role in civilian crisis management in Norway (Røksund et al., 2013), while this is a secondary task for the military (Forsvarsdepartementet, 2021), the all-police dyads were ranked second and the all-military dyads were ranked third.

Peacetime performance

Following (Murphy and Cleveland, 1995), performance was measured by two subject matter experts (SMEs) and calculated as a mean score based on the SMEs' assessment of the dyads' decision-making regarding task organization and prioritization across the 12 initial trials comprising the simulation's peace-phase. The SMEs were unaware of participant identities and assigned a score to each dyad per mission on a scale from zero to six (0 = poor and 6 = excellent). The scoring criteria were the dyads' demonstration of integrated mission management by using the full range of police and military capabilities to change or maintain the efforts necessary to achieve a successful outcome. When the SMEs' judgments differed, the final score was their average score.

The SMEs were selected on the basis of their prominent levels of academic qualifications and professional knowledge accumulated from more than 30 years of involvement in various security crises. The military SME was a recently retired general with extensive experience from the Norwegian joint headquarters. The police SME was an active-duty chief of police with extensive experience from the

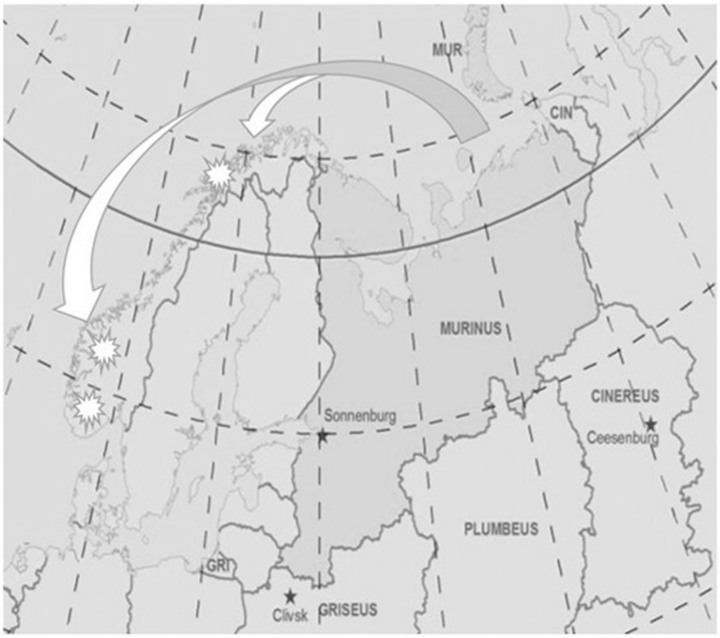

FIGURE 1
The simulation's strategic scenario. The scenario was created by the authors from a research planning session. The image and fictitious states of Murinus, Griseus, Plumbeus, and Cinereus are based on the unclassified strategic scenario of NATO's Occasus exercise module.

TABLE 1 Ordinal coding of dyad categories.

First	Second	Third
Mixed police-military dyads	All-police dyads	All-military dyads

Norwegian police directorate. The extent of their competencies thus made them subject matter experts in crisis management.

Pre-test collective self-efficacy

Pre-test collective self-efficacy was calculated as a mean score on a 12-item questionnaire. It involved a seven-point Likert scale adapted from an instrument originally developed by Bandura (2006, p. 335). Each item was a measure of generality and required judgments that applied to hybrid warfare issues corresponding in form and difficulty to those in the present scenario. For example, the dyads were asked to rate their beliefs about successfully performing crisis response-related skills in a series of headquarters activities, such as the ability to "efficiently assign tasks to subordinates despite organizational boundaries" and "successfully oversee operations to identify and detain hostile actors."

A group discussion approach was used, since it reflects the interaction processes between individuals and thus truly represents the group's beliefs (Gibson et al., 2000). Yet there are concerns that group discussions can turn into a social influence event and be subject to persuasive efforts by influential members to achieve consensus (Stajkovic et al., 2009). In the current study, however, we believe these social concerns were mitigated by our balancing of the participants' age and seniority (see note 3).[3]

Endogenous variables

Persistence

Following Seo and Ilies (2009), persistence was measured by two elements for each trial: First, the dyads' instructions regarding "effort expenditure" on a scale from zero to six, as 0 = be very restrictive and 6 = be unrestricted. Second, the dyads' "resource mobilization" on a scale from zero to four, as 0 = no troops and 4 = more than three troops. A ratio of seven to five between these elements was applied, since the dyads' effort expenditure was considered to represent persistence to a greater extent than the number of troops allocated to missions. The measure was a sum of the two elements' mean-scores across the 24 missions comprising the war phase.

3 To test the balancing of the participants' age and seniority, an ANOVA test was conducted. It showed no significant effects of age or seniority for any of the dyads.

Wartime performance

The wartime performance variable was calculated by the same SME protocol as the exogenous variable, peacetime performance. As such, wartime performance was a mean score based on the dyads' task organization and mission prioritization across the 24 trials comprising the war phase.

Post-test collective self-efficacy

Succeeding the final trial, post-test collective self-efficacy was collected as a repeated measurement using the same 12-item questionnaire as pre-test collective self-efficacy.

Procedure

The study's background information and crisis scenario were emailed to the participants prior to the day of the simulation. The study's purpose was presented as an assessment of collaborative crisis response, in which the participants' job was to work together with another participant to manage the operations of a national headquarters. Following Wood et al. (1990), the current study's decision tasks were developed in line with the theoretical considerations of SCT, and were intended to resemble the actual mission management processes of higher-level headquarters (NATO, 2013). The participants were told they could withdraw at any point, and once the simulation had started, there could be no communication between them and the researcher. All data, including the informed consent form consistent with international ethical standards of scientific research, was collected electronically.

At the start of the simulation, the participants received a scenario update that included strategic guidance and policy instructions. Subsequently, the participants completed the pre-test collective self-efficacy questionnaire. When the questionnaire was completed, the scenario unfolded.

In each trial, the participants' first decision-task was assigning troops to a given mission. Multiple-choice options were used to organize the available police and military resources into a unit, the participants believed was suitable to accomplish the task at hand. The available police resources consisted of the following: counter-terrorism police, local SWAT teams, police security service, and uniformed armed police. Furthermore, the military resources encompassed special operations forces, home guard rangers, counter-intelligence, and armed military guards. This implies that the participants could choose to mobilize a single resource, up to a maximum of eight resources on a trial.

The second decision-task was to provide intent-instructions regarding the use of force (i.e., how much effort a given set of resources should expend in the face of adversities). The participants expressed their guidance on effort expenditure by positioning a marker on a seven-point Likert scale. The anchor points on the scale were defined as "very restrictive resource expenditure" and "unrestricted resource expenditure." The midpoint indicated "moderate resource expenditure." The third decision-task was to prioritize each mission (i.e., high/medium/low) in ways believed to optimize mission execution in temporal terms. The participants expressed their priority guidance by positioning a marker on a seven-point Likert scale. It consisted of anchor points denoting "No priority" and "very high priority." The midpoint of corresponded to "respond within 24 h."

The transition from peace to war was established by a royal decree declaring a state of war. This kind of royal decrees are authorized through a special provision in the Norwegian defense act that allows the military to establish police-military cooperation and resist with all means available in the event of an armed attack on Norway (The Constitution of the Kingdom of Norway, 1917, §25). For example, it extends the constraints otherwise imposed on the use of force by peacetime legal processes to include the legitimate killing of enemy combatants and detention of foreign officials until hostilities have subsided (Beredskapsloven, 1950).

Throughout the simulation, participants could choose to reject missions if deemed appropriate. Although resource mobilization and effort expenditure were measured as zero in such cases, reject decisions could produce high performance scores if deemed appropriate by the SMEs. Justifications for rejecting missions were not collected.

The current study's path model

To analyze the dyads` organizational performance in wartime, we followed (Bandura, 1997) and applied the individual level model of Wood and Bandura (1989, p. 379) to the collective level in the present analysis. Similarly, the causal pathways in our final model were based on their temporal sequencing in the scenario.

As illustrated in Figure 2, the following modifications were made to original model of Wood and Bandura (1989): First, the "analytic strategies" endogenous variable was replaced by the "dyad composition" exogenous variable. We believe this was justified, as the participants were assigned to one of three dyad categories, based on their background. In this case, the dyads' analytical strategies were inherent to the participants' previous experience (i.e., police or military) and their respective standards of conduct (Bandura and Wood, 1989, p. 810). Secondly, the mediator variable of "personal goals" was replaced by the endogenous variable of "persistence." Although empirically related, goals and persistence are theoretically distinct constructs that affect performance (Schunk and DiBenedetto, 2021), and we believed persistence would play the most relevant role. Not only because persistence is described as a strong predictor of performance in conditions of high ambiguity (Bandura, 1986), but also because the relationship between goals and performance in ambiguous circumstances is unresolved (Oppi et al., 2022), although reverse relationships have been identified (Jung, 2014). Thirdly, our model included a direct link between pre-test collective self-efficacy and post-test collective self-efficacy. We believe this was justified, as it seems likely that variables other than mere performance feedback would serve as efficacy sources in the current study. On this note, numerous scholars have shown how perceived efficacy predicts future efficacy beliefs (Goddard et al., 2004) and that efficacy beliefs are indeed negatively related to performance in ambiguous circumstances (Schmidt and DeShon, 2010).

Statistics

The data were analyzed in SPSS Statistics 28.0.1.0. The subsequent path analysis was performed in SPSS AMOS 28.0.0.

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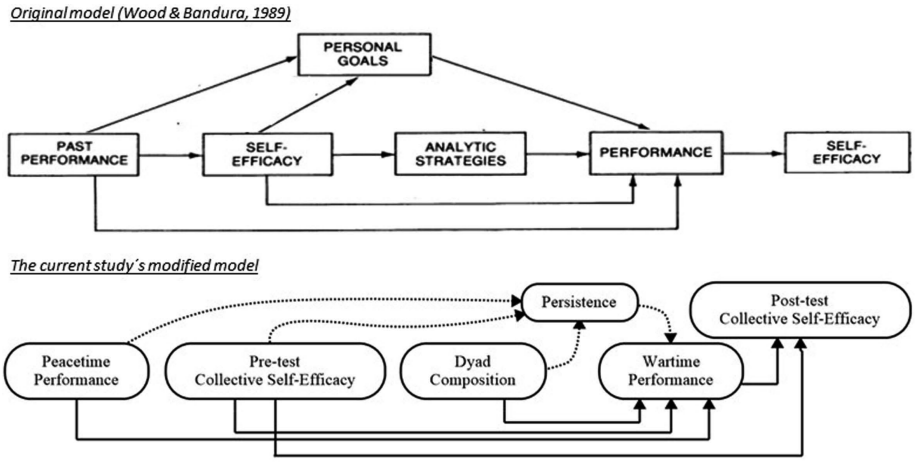

FIGURE 2
The original model as described by Wood and Bandura (1989) and the present analysis modified model. The original model of Wood and Bandura (1989) comprised two iterations of the one shown in the image.

TABLE 2 Means (M), standard deviations (SD), and Pearson's *r* correlations for the variables ($N = 69$).

	Correlations							
Variables	1	2	3	4	5	6	M	SD
1. Dyad type	-						-	-
2. Persistence	−0.30*	-					6.42	0.93
3. Peacetime performance	0.17	−0.54**	-				4.15	0.59
4. Wartime performance	0.27*	−0.61**	0.66**	-			4.57	0.46
5. Pre-test collective self-efficacy	−0.29*	−0.03	0.05	0.08	-		3.99	0.61
6. Post-test collective self-efficacy	−0.27*	0.02	−0.03	0.04	0.86**	-	4.14	0.62

*$p < 0.05$, **$p < 0.01$, two-tailed (95% confidence level). SD, Standard deviation.

For the performance measurements, the SME interrater reliability showed an intraclass correlation of 0.80 (0.76 for peacetime performance and 0.84 for wartime performance), indicating a good reliability among the SMEs. The collective self-efficacy-scale's Cronbach's alpha was 0.81 on average (0.78 for pre-test collective self-efficacy and 0.83 for post-test collective self-efficacy). The persistence scale's Cronbach's alpha was 0.91 on average (0.87 for "effort expenditure" and 0.95 for "resource mobilization"). All the scales were thus sufficiently consistent to indicate that the measures were reliable. No violations of normality were found. There was no missing data.

Results

Table 2 presents the means, standard deviations, and Pearson r correlations for the variables. The following two-tailed correlation coefficients were significant at the 0.05 level: (1) Dyad composition with persistence, wartime performance, pre-test collective self-efficacy, and post-test collective self-efficacy; (2) Peace and wartime performance with persistence; (3) Peacetime performance with wartime performance; and (4) Pre-test collective self-efficacy with post-test collective self-efficacy.

Although the correlation coefficients shed light on all the current study's hypotheses, a path analysis was necessary to determine the direct and indirect effects of the variables on each other. The final path model yielded a non-significant χ^2 (3, $N = 69$) of 1.474, $p = 0.69$; a goodness-of-fit index adjusted for degrees of freedom (AGFI) of 0.95; a normed fit index (NFI) of 0.99; and a Tucker–Lewis index (TLI) of 1.05. All indicate an excellent model fit.

R^2 for wartime performance was 0.54 ($p < 0.01$). R^2 for persistence was 0.35 ($p < 0.01$). R^2 for post-test collective self-efficacy was 0.74 ($p < 0.01$). The path analysis' outcomes are shown in Table 3 in the form of standardized and unstandardized regression weights. The path model is illustrated in Figure 3.

The following path coefficients were statistically significant at the 0.05 level: (1) The positive indirect effect of dyad composition on wartime performance through the mediation of persistence, which partially supported hypothesis 1 (H1). (2) The negative direct effect of persistence on performance, which supported hypothesis 4 (H4). (3) The negative direct effect of peacetime performance on persistence.

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TABLE 3 Decomposition of effects from path analysis.

Effect	Unstandardized coefficient	SE	Standardized coefficient	Critical ratio	R^2
1. Dyad type	0.06	0.05	0.11	1.20	0.54**
2. Peacetime performance	0.35	0.08	0.45	4.59**	
3. Persistence	−0.17	0.05	−0.33	−3.27**	
4. Pre-test CSE	0.06	0.07	0.08	0.94	
On wartime performance					
1. Dyad type	−0.26	0.12	−0.24	−2.29*	0.35**
2. Peacetime performance	−0.78	0.16	−0.50	−4.98**	
3. Pre-test CSE	−0.11	0.16	−0.07	−0.72	
On persistence					
1. Pre-test CSE	0.88	0.06	0.86	13.98**	0.74**
2. Wartime performance	−0.05	0.08	−0.03	−0.55	
On post-test CSE					
	Peacetime performance	Pre-test CSE	Wartime performance	Persistence	Dyad composition
Standardized direct effects					
Wartime performance	0.45**	0.08	-	−0.33**	0.11
Persistence	−0.50**	−0.07	-	-	−0.24*
Post-test CSE	0.00	0.86**	−0.03	-	0.00
Standardized indirect effects					
Wartime performance	0.17**	0.03	-	-	0.08*
Post-test CSE	−0.02	−0.01	-	0.01	−0.01

*$p < 0.05$, **$p < 0.01$, two-tailed (95% confidence level). CSE, Collective self-efficacy; SE, Standard error.

(4) The negative direct effect of dyad composition on persistence. (5) The positive direct effect of peacetime performance on wartime performance, which supported hypothesis 2 (H2). (6) The positive indirect effect of peacetime performance on wartime performance through mediation of persistence, which supported hypothesis 2 (H2). (7) The positive direct effect of pre-test collective efficacy on post-test collective efficacy.

A striking outcome of the present analysis was the non-significant relationship between collective self-efficacy and performance in wartime, which contradicted our hypothesis 3 (H3).

Discussion

This study illustrates how the organizational performance of police and military commanders working together to counter hybrid warfare involving conventional, irregular, terrorist, and criminal forces was predicted by four social cognitive factors: Dyad composition past performance in peacetime, collective self-efficacy, and persistence. The latter served as mediator of the others. The result suggests how these factors adequately explained a great deal of the variability in wartime performance. Our analysis thus supports how Bandura (1986) contends that adaptive self-regulation based on people's standards of adequacy has a strong influence on performance directly, but also indirectly through the mediation of persistence. It also elaborates how Schunk and DiBenedetto (2021) describe the ways social cognitive mechanisms determine how people experiencing discrepancies between standards and perceived progress create selective incentives that can lead to differential outcomes on decisions, persistence, and subsequent performance attainment in ambiguous circumstances. For example, the demonstrated links between dyad composition, persistence, and wartime performance suggest how situational properties activated differential self-evaluations of progress and the usefulness of actions in terms of the dyads' specific standards.

Our initial core finding clarified our hypothesized benefits of interagency grouping (H1) by indicating a positive indirect effect of dyad composition on wartime performance, mediated by persistence. This means that when dyad composition went up, performance went up too, due to differential effort expenditure and resource mobilization in wartime. Although this finding suggests that the dyads comprised the right competencies, it seems to indicate a degree of difference in their ability to ferret out information and prescribe efficient instructions based on ambiguous feedback. It indicates how the commanders had divergent expectations about the ways in which persistence could produce valued outcomes in the context of hybrid warfare, and has two prominent features. On the one hand, as the mixed dyads were ordered first, followed by the all-police and all-military, it reveals how our result disfavors the former and contradicts H1. On the other hand, as the unmediated path coefficient between dyad composition and wartime performance was non-significant, while the correlation coefficient was significant, it suggests that less persistent dyads achieved the highest wartime performance, which indeed provides support for H4.

Likewise, our second major finding delineates a negative direct effect of persistence on wartime performance. It elaborates the link

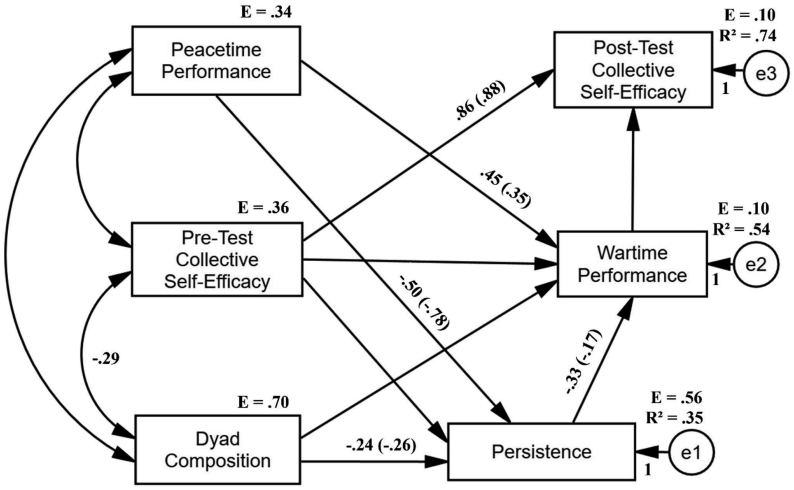

FIGURE 3
Path analysis output. Path coefficients in the form of standardized regression weights appear outside parentheses. Only statistically significant correlation/path coefficients are shown. Model fit summary: AGFI = 0.950, TLI = 1.045, and NFI = 0.992.

between reduced persistence and superior performance in wartime by illustrating how more persistent dyads were less efficient than those demonstrating lower persistence. This finding not only provides additional support for H4, but also contradicts social cognitive research explaining that greater persistence leads to higher performance (Schunk, 2012). However, we believe this finding is more in line with descriptions of Bandura (1999) of how ambiguity provides fertile grounds for misjudgment when people seek to discover how outcomes are linked to actions occurring immediately or far removed in time, with different effects depending on where and toward whom they are performed. As admonished by Weick and Sutcliffe (2015, p. 71), such misbeliefs may invoke trade-offs between accuracy and stability, generating interactions that are increasingly removed from what is actually happening. This problem is discussed by Bartone (2010), arguing how security operations that start out with limited aims may quickly escalate to much larger affairs in the direction of misbeliefs. As the aims of crisis response are not only to prevent incidents from escalating into full-scale war, but also to exploit opportunities whenever they occur (Williams, 2021), our interpretation of the negative effect of persistence on performance is that hybrid warfare, like most security crises, requires the ability to exercise control adaptively, based on nuanced understandings of the ambiguous relationship between the perceived appropriateness of tactical actions and strategic aims.

This line of reasoning was elaborated upon by the manner in which our analysis indicated a direct negative effect of peacetime performance on persistence. This result supports how Schunk and DiBenedetto (2021) assert that enhanced past performance predicts reduced persistence, as skilled individuals often have to persist less to succeed in their domain of expertise. On this note, Bandura (1999) describes how enacted mastery experiences strengthen both the skills of decision-makers and their subsequent ease of implementing actions according to standards. In the current study, our result thus suggests how the more efficient dyads in peacetime indeed expected reduced persistence levels to be effective in wartime. We reason that the more efficient dyads embraced ambiguities differently than those less successful. Subsequently, it seems that efficient dyads focused on the dangers of excessive escalation, rather than calling for intense and preemptive countermeasures.

Moreover, the analysis unveiled additional insights regarding dyad composition. While it was observed that the combination of individuals in dyads exerted a favorable indirect influence on wartime performance, it was also observed that dyad composition seemed to be associated with their overall levels of persistence during the simulation. It indicates that when dyad composition went up, persistence went down, which implies that the all-military dyads were least persistent. According to Bandura (1999), the demonstrated differential persistence levels suggest that commanders had contrasting outcome expectations and thus regulated their behavior differently. In this context, escalation appears as a stronger inhibitor of persistence for the all-military dyads, than for the other dyads. Although this is in line with research showing that police commanders prefer more urgent actions than military commanders in war (Mattingsdal et al., 2023), it also contradicts scholars arguing for the military's inclinations toward the offensive (Posen, 2014). To this end, we follow Bandura (1999) and reason that the police and military's domain-specific standards played a key role in determining the commanders' persistence in the face of hybrid warfare.

Additional support for H2 was also demonstrated by the ways the dyad's past performance in peacetime seemed to have a positive direct effect on actual performance in wartime. It suggests that dyads with enhanced performance in peacetime achieved higher performance in wartime. This supports research describing how past performance is a useful predictor of future performance (Sitzmann and Yeo, 2013). On the contrary, it also emphasizes the cautionary notes put forth by

Bandura (1999, p. 171) regarding the potential negative consequences of overreliance on past accomplishments on tasks that require deliberate and thoughtful action. In the context of warfare, for instance, if commanders become complacent and fail to adjust to change based on their earlier successes, this could ultimately result in a deterioration of their overall performance. Consequently, this underscores the importance for commanders to engage in regular situational assessments and critically evaluate the relevance of their past accomplishments. By doing so, commanders can better determine whether the strategies employed in the past remain applicable within the present context.

In light of this observation, our analysis offered further support for H2 by demonstrating how wartime performance was influenced positively by peacetime performance through the mediation of persistence. By considering the mediating role of persistence, we can understand that it is not merely the dyad's past performance itself that directly influences their wartime performance but rather their effort expenditure and resource mobilization fostered through their actions in more permissive circumstances. This lesson indicates how the successful organizing of resources in peacetime promoted a purposeful transfer of judgments beyond the initial peacetime condition. It also raises the question of whether those involved in crisis response (i.e., task organizing) are better predictors of wartime performance than how persistent they are.

However, as both our indirect findings favors the latter, our analysis suggests that commanders engaged in decision-making regarding hybrid warfare are more likely to determine their levels of persistence by evaluating environmental factors more than by comparing their present and past achievements, from one perspective. Whereas this interpretation is less convincing from the perspective of the demonstrated direct effect of peacetime performance. Thus, one could argue that these two perspectives are not in direct contradiction, they simply focus on different aspects of triadic reciprocality and reflect the asymmetric influences among the environment, person, and behavior in collaborative crisis response. Ultimately, within the context of hybrid warfare, this underscores the importance of commanders maintaining a high degree of adaptability to change in order to uphold optimal persistence levels, which, in turn, could serve as a foundation for achieving success in this ambiguous environment.

With regard to our assertions on collective self-efficacy, our findings yielded more varied outcomes compared to the results obtained for the aforementioned factors. Although the commanders' efficacy beliefs remained consistent from the beginning to the end of the simulation, the relationship between collective self-efficacy and their overall performance levels during the simulation did not appear to be significant. Similarly, efficacy beliefs did not seem to exert a substantial influence on persistence, which contradicts research showing that strong efficacy beliefs are a reliable predictor of greater persistence (Schunk and DiBenedetto, 2021). However, as pre-test collective self-efficacy explained a great deal of the variability in post-test collective self-efficacy, our result supports how Bandura (1997) and recent research (Malmberg et al., 2014) describe repeated mastery experiences as potent sources of efficacy. Even though we did not directly measure mastery experience, it indicates how most dyads interpreted their efforts favorably and lends some empirical evidence to elaborate on how professionals develop efficacy beliefs for interdependent tasks over time in ambiguous circumstances.

As such, our analysis did not provide support for the theorized link between collective self-efficacy and performance (H3). This contradicts previous studies indicating that higher collective self-efficacy is related to higher performance (Stajkovic et al., 2009), but supports how Bandura (1997) contends that even the strongest efficacy beliefs will not lead to performance attainments, unless the environment in which groups function provides appropriate opportunities for success. Thus, this could be interpreted as indicating that the simulation's ambiguous feedback did not provide room for efficient self-directed forethought. Bandura (1999) describes how such ambiguous tasks may require more emphasis on external consequences than on efficacy beliefs, to exercise control of one's actions, and how domain-specific expertise is required to achieve high levels of performance in such contexts. Hence, our results highlight the importance of police and military commanders engaging in a collective and deliberate consideration of the external outcomes that are deemed relevant. This practice has the potential to generate valuable information that complements their individual domain-specific expertise, especially in the context of cross-sectoral endeavors. Moreover these insights could enable them to make more strategic decisions, even when faced with ambiguity that may instill doubts about their ability to master a given activity.

Consequently, our analysis suggest how the efficacy beliefs of actors affected by hybrid warfare are likely to play a weak role in predicting their persistence and subsequent performance. We reason that these findings underscore why scholars argue that there is a need for prudent decision-making in times of war (Gray, 2010). For example, the simulation involved translating strategic goals into feasible actions that called for broad direction and long-term alignment of functions based on misinformation and hardly any evidence of impact. Hybrid warfare seemingly differs from research in less ambiguous settings showing great effects of collective self-efficacy on performance in work such as education (Donohoo et al., 2018), sports (Eccles and Tenenbaum, 2007), and healthcare (Smith et al., 2018).

A limitation of the present study is that path analysis only provides suggestions for ways that the processes examined influence each other (Sobel, 2000). On this basis, more definitive causal relationships could be followed up through research to analyze the links between behavioral, situational, and personal factors of decision makers. For example, how persistence predicts performance in triads or larger groups. We also recommend repeated measures research that compares between group differences in performance using police and military participants in scenarios involving collaborative responses to man-made or natural disasters.

A second limitation is the use of persistence as an endogenous variable. Although "effort expenditure" and "resource mobilization" are well-established in SCT (Bandura, 1986, p. 394) as indicators of persistent intent, it is important to note that the scale producing this variable was developed without a large-scale validation study. Nonetheless, analysis establishing standardized scores that measure persistence more accurately in collaborative crisis response is an important direction for future research.

Conclusion

In this analysis, we illustrated several important links between dyad composition, past performance in peacetime, collective self-efficacy, and persistence among police and military commanders working together in times of war. The results support research explaining the influence of adaptive self-regulation in ambiguous circumstances. It also highlights the arguments of scholars asserting that cross-sectoral dialogue is needed for the police and military commanders to prepare themselves for the challenges of the contemporary security environment, whether it involves public safety or national security. In this context, our core finding is how the standards selected as a mark of adequacy are essential for guiding interagency efforts to the successful achievement of strategic progress. We believe these results are critical for promoting police-military interoperability in the management of hybrid warfare and other transboundary threats. To this end, three implications emerge from our analysis.

Firstly, if it is true that lower persistence leads to higher performance attainment and that the influence of collective self-efficacy is weak, then commanders would be well-advised to assess their use of force-instructions throughout the conduct of a collaborative crisis response. Similarly, commanders should pay more attention to people's domain-specific skills than their perceived ability to accomplish tasks, as such perceptions are less likely to accurately predict their actual performance in wartime. Secondly, if the lack of skills leads to resource waste and risks of excessive escalation, then more realistic training exercises would be useful to improve performance by reducing transaction costs in decision-making to the extent that they increase the police and military's capacity to counter hybrid warfare. Finally, if it is true that peacetime performance predicts performance in war, then our results provide empirical evidence that the Norwegian security frameworks developed in peacetime are indeed efficient when responding to hybrid attacks in times of war.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Norwegian Agency for Shared Services in Education and Research. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

JM, JA, BJ, and RE: conceptualization and writing—review and editing. JM and BJ: methodology. JM and JA: investigation. JM: formal analysis, funding acquisition, project administration, and writing—original draft. JM, BJ, and RE: resources. RE and BJ supervised JM. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Doctoral Theses at The Faculty of Psychology, University of Bergen

1980	Allen, Hugh M., Dr. philos.	Parent-offspring interactions in willow grouse (Lagopus L. Lagopus).
1981	Myhrer, Trond, Dr. philos.	Behavioral Studies after selective disruption of hippocampal inputs in albino rats.
1982	Svebak, Sven, Dr. philos.	The significance of motivation for task-induced tonic physiological changes.
1983	Myhre, Grete, Dr. philos.	The Biopsychology of behavior in captive Willow ptarmigan.
	Eide, Rolf, Dr. philos.	PSYCHOSOCIAL FACTORS AND INDICES OF HEALTH RISKS. The relationship of psychosocial conditions to subjective complaints, arterial blood pressure, serum cholesterol, serum triglycerides and urinary catecholamines in middle aged populations in Western Norway.
	Værnes, Ragnar J., Dr. philos.	Neuropsychological effects of diving.
1984	Kolstad, Arnulf, Dr. philos.	Til diskusjonen om sammenhengen mellom sosiale forhold og psykiske strukturer. En epidemiologisk undersøkelse blant barn og unge.
	Løberg, Tor, Dr. philos.	Neuropsychological assessment in alcohol dependence.
1985	Hellesnes, Tore, Dr. philos.	Læring og problemløsning. En studie av den perseptuelle analysens betydning for verbal læring.
	Håland, Wenche, Dr. philos.	Psykoterapi: relasjon, utviklingsprosess og effekt.
1986	Hagtvet, Knut A., Dr. philos.	The construct of test anxiety: Conceptual and methodological issues.
	Jellestad, Finn K., Dr. philos.	Effects of neuron specific amygdala lesions on fear-motivated behavior in rats.
1987	Aarø, Leif E., Dr. philos.	Health behaviour and sosioeconomic Status. A survey among the adult population in Norway.
	Underlid, Kjell, Dr. philos.	Arbeidsløyse i psykososialt perspektiv.
	Laberg, Jon C., Dr. philos.	Expectancy and classical conditioning in alcoholics' craving.
	Vollmer, Fred, Dr. philos.	Essays on explanation in psychology.
	Ellertsen, Bjørn, Dr. philos.	Migraine and tension headache: Psychophysiology, personality and therapy.
1988	Kaufmann, Astrid, Dr. philos.	Antisosial atferd hos ungdom. En studie av psykologiske determinanter.

	Mykletun, Reidar J., Dr. philos.	Teacher stress: personality, work-load and health.
	Havik, Odd E., Dr. philos.	After the myocardial infarction: A medical and psychological study with special emphasis on perceived illness.
1989	Bråten, Stein, Dr. philos.	Menneskedyaden. En teoretisk tese om sinnets dialogiske natur med informasjons- og utviklingspsykologiske implikasjoner sammenholdt med utvalgte spedbarnsstudier.
	Wold, Bente, Dr. psychol.	Lifestyles and physical activity. A theoretical and empirical analysis of socialization among children and adolescents.
1990	Flaten, Magne A., Dr. psychol.	The role of habituation and learning in reflex modification.
1991	Alsaker, Françoise D., Dr. philos.	Global negative self-evaluations in early adolescence.
	Kraft, Pål, Dr. philos.	AIDS prevention in Norway. Empirical studies on diffusion of knowledge, public opinion, and sexual behaviour.
	Endresen, Inger M., Dr. philos.	Psychoimmuniological stress markers in working life.
	Faleide, Asbjørn O., Dr. philos.	Asthma and allergy in childhood. Psychosocial and psychotherapeutic problems.
1992	Dalen, Knut, Dr. philos.	Hemispheric asymmetry and the Dual-Task Paradigm: An experimental approach.
	Bø, Inge B., Dr. philos.	Ungdoms sosiale økologi. En undersøkelse av 14-16 åringers sosiale nettverk.
	Nivison, Mary E., Dr. philos.	The relationship between noise as an experimental and environmental stressor, physiological changes and psychological factors.
	Torgersen, Anne M., Dr. philos.	Genetic and environmental influence on temperamental behaviour. A longitudinal study of twins from infancy to adolescence.
1993	Larsen, Svein, Dr. philos.	Cultural background and problem drinking.
	Nordhus, Inger Hilde, Dr. philos.	Family caregiving. A community psychological study with special emphasis on clinical interventions.
	Thuen, Frode, Dr. psychol.	Accident-related behaviour among children and young adolescents: Prediction and prevention.
	Solheim, Ragnar, Dr. philos.	Spesifikke lærevansker. Diskrepanskriteriet anvendt i seleksjonsmetodikk.
	Johnsen, Bjørn Helge, Dr. psychol.	Brain assymetry and facial emotional expressions: Conditioning experiments.
1994	Tønnessen, Finn E., Dr. philos.	The etiology of Dyslexia.
	Kvale, Gerd, Dr. psychol.	Psychological factors in anticipatory nausea and vomiting in cancer chemotherapy.
	Asbjørnsen, Arve E., Dr. psychol.	Structural and dynamic factors in dichotic listening: An interactional model.

	Bru, Edvin, Dr. philos.	The role of psychological factors in neck, shoulder and low back pain among female hospitale staff.
	Braathen, Eli T., Dr. psychol.	Prediction of exellence and discontinuation in different types of sport: The significance of motivation and EMG.
	Johannessen, Birte F., Dr. philos.	Det flytende kjønnet. Om lederskap, politikk og identitet.
1995	Sam, David L., Dr. psychol.	Acculturation of young immigrants in Norway: A psychological and socio-cultural adaptation.
	Bjaalid, Inger-Kristin, Dr. philos.	Component processes in word recognition.
	Martinsen, Øyvind, Dr. philos.	Cognitive style and insight.
	Nordby, Helge, Dr. philos.	Processing of auditory deviant events: Mismatch negativity of event-related brain potentials.
	Raaheim, Arild, Dr. philos.	Health perception and health behaviour, theoretical considerations, empirical studies, and practical implications.
	Seltzer, Wencke J., Dr. philos.	Studies of Psychocultural Approach to Families in Therapy.
	Brun, Wibecke, Dr. philos.	Subjective conceptions of uncertainty and risk.
	Aas, Henrik N., Dr. psychol.	Alcohol expectancies and socialization: Adolescents learning to drink.
	Bjørkly, Stål, Dr. psychol.	Diagnosis and prediction of intra-institutional aggressive behaviour in psychotic patients
1996	Anderssen, Norman, Dr. psychol.	Physical activity of young people in a health perspective: Stability, change and social influences.
	Sandal, Gro Mjeldheim, Dr. psychol.	Coping in extreme environments: The role of personality.
	Strumse, Einar, Dr. philos.	The psychology of aesthetics: explaining visual preferences for agrarian landscapes in Western Norway.
	Hestad, Knut, Dr. philos.	Neuropsychological deficits in HIV-1 infection.
	Lugoe, L.Wycliffe, Dr. philos.	Prediction of Tanzanian students' HIV risk and preventive behaviours
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	Stormark, Kjell Morten, Dr. psychol.	Emotional modulation of selective attention: Experimental and clinical evidence.
	Einarsen, Ståle, Dr. psychol.	Bullying and harassment at work: epidemiological and psychosocial aspects.

1997	Knivsberg, Ann-Mari, Dr. philos.	Behavioural abnormalities and childhood psychopathology: Urinary peptide patterns as a potential tool in diagnosis and remediation.
	Eide, Arne H., Dr. philos.	Adolescent drug use in Zimbabwe. Cultural orientation in a global-local perspective and use of psychoactive substances among secondary school students.
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	Skjæveland, Oddvar, Dr. psychol.	Relationships between spatial-physical neighborhood attributes and social relations among neighbors.
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	Manger, Terje, Dr. philos.	Gender differences in mathematical achievement among Norwegian elementary school students.
1998 V	Lindstrøm, Torill Christine, Dr. philos.	«Good Grief»: Adapting to Bereavement.
	Skogstad, Anders, Dr. philos.	Effects of leadership behaviour on job satisfaction, health and efficiency.
	Haldorsen, Ellen M. Håland, Dr. psychol.	Return to work in low back pain patients.
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	Eriksen, Hege R., Dr. philos.	Stress and coping: Does it really matter for subjective health complaints?
	Jakobsen, Reidar, Dr. psychol.	Empiriske studier av kunnskap og holdninger om hiv/aids og den normative seksuelle utvikling i ungdomsårene.
1999 V	Mikkelsen, Aslaug, Dr. philos.	Effects of learning opportunities and learning climate on occupational health.
	Samdal, Oddrun, Dr. philos.	The school environment as a risk or resource for students' health-related behaviours and subjective well-being.
	Friestad, Christine, Dr. philos.	Social psychological approaches to smoking.
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	Engen, Liv, Dr. philos.	Kartlegging av leseferdighet på småskoletrinnet og vurdering av faktorer som kan være av betydning for optimal leseutvikling.
2000 V	Hovland, Ole Johan, Dr. philos.	Transforming a self-preserving "alarm" reaction into a self-defeating emotional response: Toward an integrative approach to anxiety as a human phenomenon.
	Lillejord, Sølvi, Dr. philos.	Handlingsrasjonalitet og spesialundervisning. En analyse av aktørperspektiver.
	Sandell, Ove, Dr. philos.	Den varme kunnskapen.
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	Eid, Jarle, Dr. psychol.	Early predictors of PTSD symptom reporting; The significance of contextual and individual factors.
2001 V	Skinstad, Anne Helene, Dr. philos.	Substance dependence and borderline personality disorders.
	Binder, Per-Einar, Dr. psychol.	Individet og den meningsbærende andre. En teoretisk undersøkelse av de mellommenneskelige forutsetningene for psykisk liv og utvikling med utgangspunkt i Donald Winnicotts teori.
	Roald, Ingvild K., Dr. philos.	Building of concepts. A study of Physics concepts of Norwegian deaf students.
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	Engelsen, Birthe Kari, Dr. psychol.	Measurement of the eating problem construct.
	Lau, Bjørn, Dr. philos.	Weight and eating concerns in adolescence.
2002 V	Ihlebæk, Camilla, Dr. philos.	Epidemiological studies of subjective health complaints.
	Rosén, Gunnar O. R., Dr. philos.	The phantom limb experience. Models for understanding and treatment of pain with hypnosis.

	Høines, Marit Johnsen, Dr. philos.	Fleksible språkrom. Matematikklæring som tekstutvikling.
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H	Ofte, Sonja Helgesen, Dr. psychol.	Right-left discrimination in adults and children.
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	Bjuland, Raymond, Dr. philos.	Problem solving in geometry. Reasoning processes of student teachers working in small groups: A dialogical approach.
2003 V	Arefjord, Kjersti, Dr. psychol.	After the myocardial infarction – the wives' view. Short- and long-term adjustment in wives of myocardial infarction patients.
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	Holsen, Ingrid, Dr. philos.	Depressed mood from adolescence to 'emerging adulthood'. Course and longitudinal influences of body image and parent-adolescent relationship.
	Hammar, Åsa Karin, Dr. psychol.	Major depression and cognitive dysfunction- An experimental study of the cognitive effort hypothesis.
	Sprugevica, Ieva, Dr. philos.	The impact of enabling skills on early reading acquisition.
	Gabrielsen, Egil, Dr. philos.	LESE FOR LIVET. Lesekompetansen i den norske voksenbefolkningen sett i lys av visjonen om en enhetsskole.
H	Hansen, Anita Lill, Dr. psychol.	The influence of heart rate variability in the regulation of attentional and memory processes.
	Dyregrov, Kari, Dr. philos.	The loss of child by suicide, SIDS, and accidents: Consequences, needs and provisions of help.
2004 V	Torsheim, Torbjørn, Dr. psychol.	Student role strain and subjective health complaints: Individual, contextual, and longitudinal perspectives.
	Haugland, Bente Storm Mowatt Dr. psychol.	Parental alcohol abuse. Family functioning and child adjustment.

	Milde, Anne Marita, Dr. psychol.	Ulcerative colitis and the role of stress. Animal studies of psychobiological factors in relationship to experimentally induced colitis.
	Stornes, Tor, Dr. philos.	Socio-moral behaviour in sport. An investigation of perceptions of sportspersonship in handball related to important factors of socio-moral influence.
	Mæhle, Magne, Dr. philos.	Re-inventing the child in family therapy: An investigation of the relevance and applicability of theory and research in child development for family therapy involving children.
	Kobbeltvedt, Therese, Dr. psychol.	Risk and feelings: A field approach.
2004 H	Thomsen, Tormod, Dr. psychol.	Localization of attention in the brain.
	Løberg, Else-Marie, Dr. psychol.	Functional laterality and attention modulation in schizophrenia: Effects of clinical variables.
	Kyrkjebø, Jane Mikkelsen, Dr. philos.	Learning to improve: Integrating continuous quality improvement learning into nursing education.
	Laumann, Karin, Dr. psychol.	Restorative and stress-reducing effects of natural environments: Experiencal, behavioural and cardiovascular indices.
	Holgersen, Helge, PhD	Mellom oss - Essay i relasjonell psykoanalyse.
2005 V	Hetland, Hilde, Dr. psychol.	Leading to the extraordinary? Antecedents and outcomes of transformational leadership.
	Iversen, Anette Christine, Dr. philos.	Social differences in health behaviour: the motivational role of perceived control and coping.
2005 H	Mathisen, Gro Ellen, PhD	Climates for creativity and innovation: Definitions, measurement, predictors and consequences.
	Sævi, Tone, Dr. philos.	Seeing disability pedagogically – The lived experience of disability in the pedagogical encounter.
	Wiium, Nora, PhD	Intrapersonal factors, family and school norms: combined and interactive influence on adolescent smoking behaviour.
	Kanagaratnam, Pushpa, PhD	Subjective and objective correlates of Posttraumatic Stress in immigrants/refugees exposed to political violence.
	Larsen, Torill M. B. , PhD	Evaluating principals` and teachers` implementation of Second Step. A case study of four Norwegian primary schools.
	Bancila, Delia, PhD	Psychosocial stress and distress among Romanian adolescents and adults.
2006 V	Hillestad, Torgeir Martin, Dr. philos.	Normalitet og avvik. Forutsetninger for et objektivt psykopatologisk avviksbegrep. En psykologisk, sosial, erkjennelsesteoretisk og teorihistorisk framstilling.
	Nordanger, Dag Øystein, Dr. psychol.	Psychosocial discourses and responses to political violence in post-war Tigray, Ethiopia.

	Rimol, Lars Morten, PhD	Behavioral and fMRI studies of auditory laterality and speech sound processing.
	Krumsvik, Rune Johan, Dr. philos.	ICT in the school. ICT-initiated school development in lower secondary school.
	Norman, Elisabeth, Dr. psychol.	Gut feelings and unconscious thought: An exploration of fringe consiousness in implicit cognition.
	Israel, K Pravin, Dr. psychol.	Parent involvement in the mental health care of children and adolescents. Emperical studies from clinical care setting.
	Glasø, Lars, PhD	Affects and emotional regulation in leader-subordinate relationships.
	Knutsen, Ketil, Dr. philos.	HISTORIER UNGDOM LEVER – En studie av hvordan ungdommer bruker historie for å gjøre livet meningsfullt.
	Matthiesen, Stig Berge, PhD	Bullying at work. Antecedents and outcomes.
2006 H	Gramstad, Arne, PhD	Neuropsychological assessment of cognitive and emotional functioning in patients with epilepsy.
	Bendixen, Mons, PhD	Antisocial behaviour in early adolescence: Methodological and substantive issues.
	Mrumbi, Khalifa Maulid, PhD	Parental illness and loss to HIV/AIDS as experienced by AIDS orphans aged between 12-17 years from Temeke District, Dar es Salaam, Tanzania: A study of the children's psychosocial health and coping responses.
	Hetland, Jørn, Dr. psychol.	The nature of subjective health complaints in adolescence: Dimensionality, stability, and psychosocial predictors
	Kakoko, Deodatus Conatus Vitalis, PhD	Voluntary HIV counselling and testing service uptake among primary school teachers in Mwanza, Tanzania: assessment of socio-demographic, psychosocial and socio-cognitive aspects
	Mykletun, Arnstein, Dr. psychol.	Mortality and work-related disability as long-term consequences of anxiety and depression: Historical cohort designs based on the HUNT-2 study
	Sivertsen, Børge, PhD	Insomnia in older adults. Consequences, assessment and treatment.
2007 V	Singhammer, John, Dr. philos.	Social conditions from before birth to early adulthood – the influence on health and health behaviour
	Janvin, Carmen Ani Cristea, PhD	Cognitive impairment in patients with Parkinson's disease: profiles and implications for prognosis
	Braarud, Hanne Cecilie, Dr.psychol.	Infant regulation of distress: A longitudinal study of transactions between mothers and infants
	Tveito, Torill Helene, PhD	Sick Leave and Subjective Health Complaints
	Magnussen, Liv Heide, PhD	Returning disability pensioners with back pain to work

	Thuen, Elin Marie, Dr.philos.	Learning environment, students' coping styles and emotional and behavioural problems. A study of Norwegian secondary school students.
	Solberg, Ole Asbjørn, PhD	Peacekeeping warriors – A longitudinal study of Norwegian peacekeepers in Kosovo
2007 H	Søreide, Gunn Elisabeth, Dr.philos.	Narrative construction of teacher identity
	Svensen, Erling, PhD	WORK & HEALTH. Cognitive Activation Theory of Stress applied in an organisational setting.
	Øverland, Simon Nygaard, PhD	Mental health and impairment in disability benefits. Studies applying linkages between health surveys and administrative registries.
	Eichele, Tom, PhD	Electrophysiological and Hemodynamic Correlates of Expectancy in Target Processing
	Børhaug, Kjetil, Dr.philos.	Oppseding til demokrati. Ein studie av politisk oppseding i norsk skule.
	Eikeland, Thorleif, Dr.philos.	Om å vokse opp på barnehjem og på sykehus. En undersøkelse av barnehjemsbarns opplevelser på barnehjem sammenholdt med sanatoriebarns beskrivelse av langvarige sykehusopphold – og et forsøk på forklaring.
	Wadel, Carl Cato, Dr.philos.	Medarbeidersamhandling og medarbeiderledelse i en lagbasert organisasjon
	Vinje, Hege Forbech, PhD	Thriving despite adversity: Job engagement and self-care among community nurses
	Noort, Maurits van den, PhD	Working memory capacity and foreign language acquisition
2008 V	Breivik, Kyrre, Dr.psychol.	The Adjustment of Children and Adolescents in Different Post-Divorce Family Structures. A Norwegian Study of Risks and Mechanisms.
	Johnsen, Grethe E., PhD	Memory impairment in patients with posttraumatic stress disorder
	Sætrevik, Bjørn, PhD	Cognitive Control in Auditory Processing
	Carvalhosa, Susana Fonseca, PhD	Prevention of bullying in schools: an ecological model
2008 H	Brønnick, Kolbjørn Selvåg	Attentional dysfunction in dementia associated with Parkinson's disease.
	Posserud, Maj-Britt Rocio	Epidemiology of autism spectrum disorders
	Haug, Ellen	Multilevel correlates of physical activity in the school setting
	Skjerve, Arvid	Assessing mild dementia – a study of brief cognitive tests.

	Kjønniksen, Lise	The association between adolescent experiences in physical activity and leisure time physical activity in adulthood: a ten year longitudinal study
	Gundersen, Hilde	The effects of alcohol and expectancy on brain function
	Omvik, Siri	Insomnia – a night and day problem
2009 V	Molde, Helge	Pathological gambling: prevalence, mechanisms and treatment outcome.
	Foss, Else	Den omsorgsfulle væremåte. En studie av voksnes væremåte i forhold til barn i barnehagen.
	Westrheim, Kariane	Education in a Political Context: A study of Konwledge Processes and Learning Sites in the PKK.
	Wehling, Eike	Cognitive and olfactory changes in aging
	Wangberg, Silje C.	Internet based interventions to support health behaviours: The role of self-efficacy.
	Nielsen, Morten B.	Methodological issues in research on workplace bullying. Operationalisations, measurements and samples.
	Sandu, Anca Larisa	MRI measures of brain volume and cortical complexity in clinical groups and during development.
	Guribye, Eugene	Refugees and mental health interventions
	Sørensen, Lin	Emotional problems in inattentive children – effects on cognitive control functions.
	Tjomsland, Hege E.	Health promotion with teachers. Evaluation of the Norwegian Network of Health Promoting Schools: Quantitative and qualitative analyses of predisposing, reinforcing and enabling conditions related to teacher participation and program sustainability.
	Helleve, Ingrid	Productive interactions in ICT supported communities of learners
2009 H	Skorpen, Aina Øye, Christine	Dagliglivet i en psykiatrisk institusjon: En analyse av miljøterapeutiske praksiser
	Andreassen, Cecilie Schou	WORKAHOLISM – Antecedents and Outcomes
	Stang, Ingun	Being in the same boat: An empowerment intervention in breast cancer self-help groups
	Sequeira, Sarah Dorothee Dos Santos	The effects of background noise on asymmetrical speech perception
	Kleiven, Jo, dr.philos.	The Lillehammer scales: Measuring common motives for vacation and leisure behavior
	Jónsdóttir, Guðrún	Dubito ergo sum? Ni jenter møter naturfaglig kunnskap.
	Hove, Oddbjørn	Mental health disorders in adults with intellectual disabilities - Methods of assessment and prevalence of mental health disorders and problem behaviour
	Wageningen, Heidi Karin van	The role of glutamate on brain function

	Bjørkvik, Jofrid	God nok? Selvaktelse og interpersonlig fungering hos pasienter innen psykisk helsevern: Forholdet til diagnoser, symptomer og behandlingsutbytte
	Andersson, Martin	A study of attention control in children and elderly using a forced-attention dichotic listening paradigm
	Almås, Aslaug Grov	Teachers in the Digital Network Society: Visions and Realities. A study of teachers' experiences with the use of ICT in teaching and learning.
	Ulvik, Marit	Lærerutdanning som danning? Tre stemmer i diskusjonen
2010 V	Skår, Randi	Læringsprosesser i sykepleieres profesjonsutøvelse. En studie av sykepleieres læringserfaringer.
	Roald, Knut	Kvalitetsvurdering som organisasjonslæring mellom skole og skoleeigar
	Lunde, Linn-Heidi	Chronic pain in older adults. Consequences, assessment and treatment.
	Danielsen, Anne Grete	Perceived psychosocial support, students' self-reported academic initiative and perceived life satisfaction
	Hysing, Mari	Mental health in children with chronic illness
	Olsen, Olav Kjellevold	Are good leaders moral leaders? The relationship between effective military operational leadership and morals
	Riese, Hanne	Friendship and learning. Entrepreneurship education through mini-enterprises.
	Holthe, Asle	Evaluating the implementation of the Norwegian guidelines for healthy school meals: A case study involving three secondary schools
H	Hauge, Lars Johan	Environmental antecedents of workplace bullying: A multi-design approach
	Bjørkelo, Brita	Whistleblowing at work: Antecedents and consequences
	Reme, Silje Endresen	Common Complaints – Common Cure? Psychiatric comorbidity and predictors of treatment outcome in low back pain and irritable bowel syndrome
	Helland, Wenche Andersen	Communication difficulties in children identified with psychiatric problems
	Beneventi, Harald	Neuronal correlates of working memory in dyslexia
	Thygesen, Elin	Subjective health and coping in care-dependent old persons living at home
	Aanes, Mette Marthinussen	Poor social relationships as a threat to belongingness needs. Interpersonal stress and subjective health complaints: Mediating and moderating factors.
	Anker, Morten Gustav	Client directed outcome informed couple therapy

	Bull, Torill	Combining employment and child care: The subjective well-being of single women in Scandinavia and in Southern Europe
	Viig, Nina Grieg	Tilrettelegging for læreres deltakelse i helsefremmende arbeid. En kvalitativ og kvantitativ analyse av sammenhengen mellom organisatoriske forhold og læreres deltakelse i utvikling og implementering av Europeisk Nettverk av Helsefremmende Skoler i Norge
	Wolff, Katharina	To know or not to know? Attitudes towards receiving genetic information among patients and the general public.
	Ogden, Terje, dr.philos.	Familiebasert behandling av alvorlige atferdsproblemer blant barn og ungdom. Evaluering og implementering av evidensbaserte behandlingsprogrammer i Norge.
	Solberg, Mona Elin	Self-reported bullying and victimisation at school: Prevalence, overlap and psychosocial adjustment.
2011 V	Bye, Hege Høivik	Self-presentation in job interviews. Individual and cultural differences in applicant self-presentation during job interviews and hiring managers' evaluation
	Notelaers, Guy	Workplace bullying. A risk control perspective.
	Moltu, Christian	Being a therapist in difficult therapeutic impasses. A hermeneutic phenomenological analysis of skilled psychotherapists' experiences, needs, and strategies in difficult therapies ending well.
	Myrseth, Helga	Pathological Gambling - Treatment and Personality Factors
	Schanche, Elisabeth	From self-criticism to self-compassion. An empirical investigation of hypothesized change prosesses in the Affect Phobia Treatment Model of short-term dynamic psychotherapy for patients with Cluster C personality disorders.
	Våpenstad, Eystein Victor, dr.philos.	Det tempererte nærvær. En teoretisk undersøkelse av psykoterapautens subjektivitet i psykoanalyse og psykoanalytisk psykoterapi.
	Haukebø, Kristin	Cognitive, behavioral and neural correlates of dental and intra-oral injection phobia. Results from one treatment and one fMRI study of randomized, controlled design.
	Harris, Anette	Adaptation and health in extreme and isolated environments. From 78°N to 75°S.
	Bjørknes, Ragnhild	Parent Management Training-Oregon Model: intervention effects on maternal practice and child behavior in ethnic minority families
	Mamen, Asgeir	Aspects of using physical training in patients with substance dependence and additional mental distress
	Espevik, Roar	Expert teams: Do shared mental models of team members make a difference
	Haara, Frode Olav	Unveiling teachers' reasons for choosing practical activities in mathematics teaching

2011 H	Hauge, Hans Abraham	How can employee empowerment be made conducive to both employee health and organisation performance? An empirical investigation of a tailor-made approach to organisation learning in a municipal public service organisation.
	Melkevik, Ole Rogstad	Screen-based sedentary behaviours: pastimes for the poor, inactive and overweight? A cross-national survey of children and adolescents in 39 countries.
	Vøllestad, Jon	Mindfulness-based treatment for anxiety disorders. A quantitative review of the evidence, results from a randomized controlled trial, and a qualitative exploration of patient experiences.
	Tolo, Astrid	Hvordan blir lærerkompetanse konstruert? En kvalitativ studie av PPU-studenters kunnskapsutvikling.
	Saus, Evelyn-Rose	Training effectiveness: Situation awareness training in simulators
	Nordgreen, Tine	Internet-based self-help for social anxiety disorder and panic disorder. Factors associated with effect and use of self-help.
	Munkvold, Linda Helen	Oppositional Defiant Disorder: Informant discrepancies, gender differences, co-occuring mental health problems and neurocognitive function.
	Christiansen, Øivin	Når barn plasseres utenfor hjemmet: beslutninger, forløp og relasjoner. Under barnevernets (ved)tak.
	Brunborg, Geir Scott	Conditionability and Reinforcement Sensitivity in Gambling Behaviour
	Hystad, Sigurd William	Measuring Psychological Resiliency: Validation of an Adapted Norwegian Hardiness Scale
2012 V	Roness, Dag	Hvorfor bli lærer? Motivasjon for utdanning og utøving.
	Fjermestad, Krister Westlye	The therapeutic alliance in cognitive behavioural therapy for youth anxiety disorders
	Jenssen, Eirik Sørnes	Tilpasset opplæring i norsk skole: politikeres, skoleledereres og læreres handlingsvalg
	Saksvik-Lehouillier, Ingvild	Shift work tolerance and adaptation to shift work among offshore workers and nurses
	Johansen, Venke Frederike	Når det intime blir offentlig. Om kvinners åpenhet om brystkreft og om markedsføring av brystkreftsaken.
	Herheim, Rune	Pupils collaborating in pairs at a computer in mathematics learning: investigating verbal communication patterns and qualities
	Vie, Tina Løkke	Cognitive appraisal, emotions and subjective health complaints among victims of workplace bullying: A stress-theoretical approach
	Jones, Lise Øen	Effects of reading skills, spelling skills and accompanying efficacy beliefs on participation in education. A study in Norwegian prisons.

2012 H	Danielsen, Yngvild Sørebø	Childhood obesity – characteristics and treatment. Psychological perspectives.
	Horverak, Jøri Gytre	Sense or sensibility in hiring processes. Interviewee and interviewer characteristics as antecedents of immigrant applicants' employment probabilities. An experimental approach.
	Jøsendal, Ola	Development and evaluation of BE smokeFREE, a school-based smoking prevention program
	Osnes, Berge	Temporal and Posterior Frontal Involvement in Auditory Speech Perception
	Drageset, Sigrunn	Psychological distress, coping and social support in the diagnostic and preoperative phase of breast cancer
	Aasland, Merethe Schanke	Destructive leadership: Conceptualization, measurement, prevalence and outcomes
	Bakibinga, Pauline	The experience of job engagement and self-care among Ugandan nurses and midwives
	Skogen, Jens Christoffer	Foetal and early origins of old age health. Linkage between birth records and the old age cohort of the Hordaland Health Study (HUSK)
	Leversen, Ingrid	Adolescents' leisure activity participation and their life satisfaction: The role of demographic characteristics and psychological processes
	Hanss, Daniel	Explaining sustainable consumption: Findings from cross-sectional and intervention approaches
	Rød, Per Arne	Barn i klem mellom foreldrekonflikter og samfunnsmessig beskyttelse
2013 V	Mentzoni, Rune Aune	Structural Characteristics in Gambling
	Knudsen, Ann Kristin	Long-term sickness absence and disability pension award as consequences of common mental disorders. Epidemiological studies using a population-based health survey and official ill health benefit registries.
	Strand, Mari	Emotional information processing in recurrent MDD
	Veseth, Marius	Recovery in bipolar disorder. A reflexive-collaborative exploration of the lived experiences of healing and growth when battling a severe mental illness
	Mæland, Silje	Sick leave for patients with severe subjective health complaints. Challenges in general practice.
	Mjaaland, Thera	At the frontiers of change? Women and girls' pursuit of education in north-western Tigray, Ethiopia
	Odéen, Magnus	Coping at work. The role of knowledge and coping expectancies in health and sick leave.
	Hynninen, Kia Minna Johanna	Anxiety, depression and sleep disturbance in chronic obstructive pulmonary disease (COPD). Associations, prevalence and effect of psychological treatment.
	Flo, Elisabeth	Sleep and health in shift working nurses

	Aasen, Elin Margrethe	From paternalism to patient participation? The older patients undergoing hemodialysis, their next of kin and the nurses: a discursive perspective on perception of patient participation in dialysis units
	Ekornås, Belinda	Emotional and Behavioural Problems in Children: Self-perception, peer relationships, and motor abilities
	Corbin, J. Hope	North-South Partnerships for Health: Key Factors for Partnership Success from the Perspective of the KIWAKKUKI
	Birkeland, Marianne Skogbrott	Development of global self-esteem: The transition from adolescence to adulthood
2013 H	Gianella-Malca, Camila	Challenges in Implementing the Colombian Constitutional Court's Health-Care System Ruling of 2008
	Hovland, Anders	Panic disorder – Treatment outcomes and psychophysiological concomitants
	Mortensen, Øystein	The transition to parenthood – Couple relationships put to the test
	Årdal, Guro	Major Depressive Disorder – a Ten Year Follow-up Study. Inhibition, Information Processing and Health Related Quality of Life
	Johansen, Rino Bandlitz	The impact of military identity on performance in the Norwegian armed forces
	Bøe, Tormod	Socioeconomic Status and Mental Health in Children and Adolescents
2014 V	Nordmo, Ivar	Gjennom nåløyet – studenters læringserfaringer i psykologutdanningen
	Dovran, Anders	Childhood Trauma and Mental Health Problems in Adult Life
	Hegelstad, Wenche ten Velden	Early Detection and Intervention in Psychosis: A Long-Term Perspective
	Urheim, Ragnar	Forståelse av pasientaggresjon og forklaringer på nedgang i voldsrate ved Regional sikkerhetsavdeling, Sandviken sykehus
	Kinn, Liv Grethe	Round-Trips to Work. Qualitative studies of how persons with severe mental illness experience work integration.
	Rød, Anne Marie Kinn	Consequences of social defeat stress for behaviour and sleep. Short-term and long-term assessments in rats.
	Nygård, Merethe	Schizophrenia – Cognitive Function, Brain Abnormalities, and Cannabis Use
	Tjora, Tore	Smoking from adolescence through adulthood: the role of family, friends, depression and socioeconomic status. Predictors of smoking from age 13 to 30 in the "The Norwegian Longitudinal Health Behaviour Study" (NLHB)
	Vangsnes, Vigdis	The Dramaturgy and Didactics of Computer Gaming. A Study of a Medium in the Educational Context of Kindergartens.

	Nordahl, Kristin Berg	Early Father-Child Interaction in a Father-Friendly Context: Gender Differences, Child Outcomes, and Protective Factors related to Fathers' Parenting Behaviors with One-year-olds
2014 H	Sandvik, Asle Makoto	Psychopathy – the heterogenety of the construct
	Skotheim, Siv	Maternal emotional distress and early mother-infant interaction: Psychological, social and nutritional contributions
	Halleland, Helene Barone	Executive Functioning in adult Attention Deficit Hyperactivity Disorder (ADHD). From basic mechanisms to functional outcome.
	Halvorsen, Kirsti Vindal	Partnerskap i lærerutdanning, sett fra et økologisk perspektiv
	Solbue, Vibeke	Dialogen som visker ut kategorier. En studie av hvilke erfaringer innvandrerungdommer og norskfødte med innvandrerforeldre har med videregående skole. Hva forteller ungdommenes erfaringer om videregående skoles håndtering av etniske ulikheter?
	Kvalevaag, Anne Lise	Fathers' mental health and child development. The predictive value of fathers' psychological distress during pregnancy for the social, emotional and behavioural development of their children
	Sandal, Ann Karin	Ungdom og utdanningsval. Om elevar sine opplevingar av val og overgangsprosessar.
	Haug, Thomas	Predictors and moderators of treatment outcome from high- and low-intensity cognitive behavioral therapy for anxiety disorders. Association between patient and process factors, and the outcome from guided self-help, stepped care, and face-to-face cognitive behavioral therapy.
	Sjølie, Hege	Experiences of Members of a Crisis Resolution Home Treatment Team. Personal history, professional role and emotional support in a CRHT team.
	Falkenberg, Liv Eggset	Neuronal underpinnings of healthy and dysfunctional cognitive control
	Mrdalj, Jelena	The early life condition. Importance for sleep, circadian rhythmicity, behaviour and response to later life challenges
	Hesjedal, Elisabeth	Tverrprofesjonelt samarbeid mellom skule og barnevern: Kva kan støtte utsette barn og unge?
2015 V	Hauken, May Aasebø	«*The cancer treatment was only half the work!»* A Mixed-Method Study of Rehabilitation among Young Adult Cancer Survivors
	Ryland, Hilde Katrin	Social functioning and mental health in children: the influence of chronic illness and intellectual function
	Rønsen, Anne Kristin	Vurdering som profesjonskompetanse. Refleksjonsbasert utvikling av læreres kompetanse i formativ vurdering

	Hoff, Helge Andreas	Thinking about Symptoms of Psychopathy in Norway: Content Validation of the Comprehensive Assessment of Psychopathic Personality (CAPP) Model in a Norwegian Setting
	Schmid, Marit Therese	Executive Functioning in recurrent- and first episode Major Depressive Disorder. Longitudinal studies
	Sand, Liv	Body Image Distortion and Eating Disturbances in Children and Adolescents
	Matanda, Dennis Juma	Child physical growth and care practices in Kenya: Evidence from Demographic and Health Surveys
	Amugsi, Dickson Abanimi	Child care practices, resources for care, and nutritional outcomes in Ghana: Findings from Demographic and Health Surveys
	Jakobsen, Hilde	The good beating: Social norms supporting men's partner violence in Tanzania
	Sagoe, Dominic	Nonmedical anabolic-androgenic steroid use: Prevalence, attitudes, and social perception
	Eide, Helene Marie Kjærgård	Narrating the relationship between leadership and learning outcomes. A study of public narratives in the Norwegian educational sector.
2015 H	Wubs, Annegreet Gera	Intimate partner violence among adolescents in South Africa and Tanzania
	Hjelmervik, Helene Susanne	Sex and sex-hormonal effects on brain organization of fronto-parietal networks
	Dahl, Berit Misund	The meaning of professional identity in public health nursing
	Røykenes, Kari	Testangst hos sykepleierstudenter: «Alternativ behandling»
	Bless, Josef Johann	The smartphone as a research tool in psychology. Assessment of language lateralization and training of auditory attention.
	Løvvik, Camilla Margrethe Sigvaldsen	Common mental disorders and work participation – the role of return-to-work expectations
	Lehmann, Stine	Mental Disorders in Foster Children: A Study of Prevalence, Comorbidity, and Risk Factors
	Knapstad, Marit	Psychological factors in long-term sickness absence: the role of shame and social support. Epidemiological studies based on the Health Assets Project.
2016 V	Kvestad, Ingrid	Biological risks and neurodevelopment in young North Indian children
	Sælør, Knut Tore	Hinderløyper, halmstrå og hengende snører. En kvalitativ studie av håp innenfor psykisk helse- og rusfeltet.
	Mellingen, Sonja	Alkoholbruk, partilfredshet og samlivsstatus. Før, inn i, og etter svangerskapet – korrelater eller konsekvenser?
	Thun, Eirunn	Shift work: negative consequences and protective factors

	Hilt, Line Torbjørnsen	The borderlands of educational inclusion. Analyses of inclusion and exclusion processes for minority language students
	Havnen, Audun	Treatment of obsessive-compulsive disorder and the importance of assessing clinical effectiveness
	Slåtten, Hilde	Gay-related name-calling among young adolescents. Exploring the importance of the context.
	Ree, Eline	Staying at work. The role of expectancies and beliefs in health and workplace interventions.
	Morken, Frøydis	Reading and writing processing in dyslexia
2016 H	Løvoll, Helga Synnevåg	Inside the outdoor experience. On the distinction between pleasant and interesting feelings and their implication in the motivational process.
	Hjeltnes, Aslak	Facing social fears: An investigation of mindfulness-based stress reduction for young adults with social anxiety disorder
	Øyeflaten, Irene Larsen	Long-term sick leave and work rehabilitation. Prognostic factors for return to work.
	Henriksen, Roger Ekeberg	Social relationships, stress and infection risk in mother and child
	Johnsen, Iren	«Only a friend» - The bereavement process of young adults who have lost a friend to a traumatic death. A mixed methods study.
	Helle, Siri	Cannabis use in non-affective psychoses: Relationship to age at onset, cognitive functioning and social cognition
	Glambek, Mats	Workplace bullying and expulsion in working life. A representative study addressing prospective associations and explanatory conditions.
	Oanes, Camilla Jensen	Tilbakemelding i terapi. På hvilke måter opplever terapeuter at tilbakemeldingsprosedyrer kan virke inn på terapeutiske praksiser?
	Reknes, Iselin	Exposure to workplace bullying among nurses: Health outcomes and individual coping
	Chimhutu, Victor	Results-Based Financing (RBF) in the health sector of a low-income country. From agenda setting to implementation: The case of Tanzania
	Ness, Ingunn Johanne	The Room of Opportunity. Understanding how knowledge and ideas are constructed in multidisciplinary groups working with developing innovative ideas.
	Hollekim, Ragnhild	Contemporary discourses on children and parenting in Norway. An empirical study based on two cases.
	Doran, Rouven	Eco-friendly travelling: The relevance of perceived norms and social comparison
2017 V	Katisi, Masego	The power of context in health partnerships: Exploring synergy and antagony between external and internal ideologies in implementing Safe Male Circumcision (SMC) for HIV prevention in Botswana

	Jamaludin, Nor Lelawati Binti	The “why” and “how” of International Students’ Ambassadorship Roles in International Education
	Berthelsen, Mona	Effects of shift work and psychological and social work factors on mental distress. Studies of onshore/offshore workers and nurses in Norway.
	Krane, Vibeke	Lærer-elev-relasjoner, elevers psykiske helse og frafall i videregående skole – en eksplorerende studie om samarbeid og den store betydningen av de små ting
	Søvik, Margaret Ljosnes	Evaluating the implementation of the Empowering Coaching™ program in Norway
	Tonheim, Milfrid	A troublesome transition: Social reintegration of girl soldiers returning ‘home’
	Senneseth, Mette	Improving social network support for partners facing spousal cancer while caring for minors. A randomized controlled trial.
	Urke, Helga Bjørnøy	Child health and child care of very young children in Bolivia, Colombia and Peru.
	Bakhturidze, George	Public Participation in Tobacco Control Policy-making in Georgia
	Fismen, Anne-Siri	Adolescent eating habits. Trends and socio-economic status.
2017 H	Hagatun, Susanne	Internet-based cognitive-behavioural therapy for insomnia. A randomised controlled trial in Norway.
	Eichele, Heike	Electrophysiological Correlates of Performance Monitoring in Children with Tourette Syndrome. A developmental perspective.
	Risan, Ulf Patrick	Accommodating trauma in police interviews. An exploration of rapport in investigative interviews of traumatized victims.
	Sandhåland, Hilde	Safety on board offshore vessels: A study of shipboard factors and situation awareness
	Blågestad, Tone Fidje	Less pain – better sleep and mood? Interrelatedness of pain, sleep and mood in total hip arthroplasty patients
	Kronstad, Morten	Frå skulebenk til deadlines. Korleis nettjournalistar og journaliststudentar lærer, og korleis dei utviklar journalistfagleg kunnskap
	Vedaa, Øystein	Shift work: The importance of sufficient time for rest between shifts.
	Steine, Iris Mulders	Predictors of symptoms outcomes among adult survivors of sexual abuse: The role of abuse characteristics, cumulative childhood maltreatment, genetic variants, and perceived social support.
	Høgheim, Sigve	Making math interesting: An experimental study of interventions to encourage interest in mathematics

2018 V	Brevik, Erlend Joramo	Adult Attention Deficit Hyperactivity Disorder. Beyond the Core Symptoms of the Diagnostic and Statistical Manual of Mental Disorders.
	Erevik, Eilin Kristine	User-generated alcohol-related content on social media: Determinants and relation to offline alcohol use
	Hagen, Egon	Cognitive and psychological functioning in patients with substance use disorder; from initial assessment to one-year recovery
	Adólfsdóttir, Steinunn	Subcomponents of executive functions: Effects of age and brain maturations
	Brattabø, Ingfrid Vaksdal	Detection of child maltreatment, the role of dental health personnel – A national cross-sectional study among public dental health personnel in Norway
	Fylkesnes, Marte Knag	Frykt, forhandlinger og deltakelse. Ungdommer og foreldre med etnisk minoritetsbakgrunn i møte med den norske barnevernstjenesten.
	Stiegler, Jan Reidar	Processing emotions in emotion-focused therapy. Exploring the impact of the two-chair dialogue intervention.
	Egelandsdal, Kjetil	Clickers and Formative Feedback at University Lectures. Exploring students and teachers' reception and use of feedback from clicker interventions.
	Torjussen, Lars Petter Storm	Foreningen av visdom og veltalenhet – utkast til en universitetsdidaktikk gjennom en kritikk og videreføring av Skjervheims pedagogiske filosofi på bakgrunn av Arendt og Foucault. *Eller hvorfor menneskelivet er mer som å spille fløyte enn å bygge et hus.*
	Selvik, Sabreen	A childhood at refuges. Children with multiple relocations at refuges for abused women.
2018 H	Leino, Tony Mathias	Structural game characteristics, game features, financial outcomes and gambling behaviour
	Raknes, Solfrid	Anxious Adolescents: Prevalence, Correlates, and Preventive Cogntive Behavioural Interventions
	Morken, Katharina Teresa Enehaug	Mentalization-based treatment of female patients with severe personality disorder and substance use disorder
	Braatveit, Kirsten Johanne	Intellectual disability among in-patients with substance use disorders
	Barua, Padmaja	Unequal Interdependencies: Exploring Power and Agency in Domestic Work Relations in Contemporary India
	Darkwah, Ernest	Caring for "parentless" children. An exploration of work-related experiences of caregivers in children's homes in Ghana.
	Valdersnes, Kjersti Bergheim	Safety Climate perceptions in High Reliability Organizations – the role of Psychological Capital

2019 V	Kongsgården, Petter	Vurderingspraksiser i teknologirike læringsmiljøer. En undersøkelse av læreres vurderingspraksiser i teknologirike læringsmiljøer og implikasjoner på elevenes medvirkning i egen læringsprosess.
	Vikene, Kjetil	Complexity in Rhythm and Parkinson's disease: Cognitive and Neuronal Correlates
	Heradstveit, Ove	Alcohol- and drug use among adolescents. School-related problems, childhood mental health problems, and psychiatric diagnoses.
	Riise, Eili Nygard	Concentrated exposure and response prevention for obsessive-compulsive disorder in adolescents: the Bergen 4-day treatment
	Vik, Alexandra	Imaging the Aging Brain: From Morphometry to Functional Connectivity
	Krossbakken, Elfrid	Personal and Contextual Factors Influencing Gaming Behaviour. Risk Factors and Prevention of Video Game Addiction.
	Solholm, Roar	Foreldrenes status og rolle i familie- og nærmiljøbaserte intervensjoner for barn med atferdsvansker
	Baldomir, Andrea Margarita	Children at Risk and Mothering Networks in Buenos Aires, Argentina: Analyses of Socialization and Law-Abiding Practices in Public Early Childhood Intervention.
	Samuelsson, Martin Per	Education for Deliberative Democracy. Theoretical assumptions and classroom practices.
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