Naval War College students in National Security Affairs Department participate in Theater Security Decision Making Final Exercise in Spruance Auditorium, November 6, 2019, in Newport, Rhode Island (U.S. Navy/Tyler D. John)

Challenges to Creative Thinking

Identifying Officer Background Beliefs in Limited Information Environments

By Zachary Zwald, Jeffrey Berejikian, Samantha Jane Daly, and Jeffrey Hannon

The nature of the current threat environment presents a challenge to U.S. national security that necessitates creative thinking by military officers. In 2020, the Joint Chiefs of Staff released a guidance document stating that the "profound and rapidly changing character of war and conflict" requires "the development of strategically minded joint warfighters who think critically and can creatively apply military power to inform national strategy."[1] This article conveys the results of the first empirical analysis of the background beliefs, or *operative theories*, that officers employ when applying military power to inform national strategy. It then outlines the implications of these findings and recommends ways to develop strategically minded military officers.

Dr. Zachary Zwald is an Instructional Assistant Professor in the Department of Political Science at the University of Houston. Dr. Jeffrey D. Berejikian is a Josiah Meigs Distinguished Teaching Professor at the University of Georgia (UGA) and Associate Professor in the Department of International Affairs. Samantha Jane Daly is a Master of International Policy Candidate in the Department of International Affairs at UGA. Jeffrey Hannon is a Doctoral Candidate in the Department of International Affairs at UGA.

Decision environments with incomplete and ambiguous information, such as military crises, present officers with irreducible uncertainty about both the nature of the threat at hand and the eventual costs and benefits of pursuing one course of action (COA) over another. In response to such uncertainties, all decisionmakers, regardless of intelligence or level of substantive expertise, necessarily decide how best to proceed by relying on an existing set of beliefs about how the world works to provide context and fill in gaps about what is unknown at the moment.[2] Existing research suggests that an officer's capacity to think creatively under such circumstances requires both self-awareness about one's own prevailing operative theory and flexibility in interpreting new information in the context of multiple competing theories.[3] Here, the term *flexibility* refers to the ability to employ an operative theory while remaining open to new information—and alternative interpretations of that information—to arrive at a nuanced and conditional judgment about which COA to pursue.

This study, therefore, takes a necessary initial step toward improving officers' capacity for self-awareness and flexibility by empirically examining the content and impact of their operative theories during a military crisis marked by limited information. We presented a multi-Service sample of officers (O4 through O7) attending a professional military education (PME) institution with one of three decisionmaking experiments that varied according to conflict domain (conventional, nuclear, or cyber). This approach allowed us to empirically answer a few critical questions: To what extent do military officers engage in discernible patterns of theory-driven thinking during crises? Do those patterns of thinking correspond to the COA these officers recommend? Do the theories employed vary by conflict domain? Does an officer's Service branch affect the pattern of theory-driven thinking exhibited?

In brief, our findings demonstrate that military officers display distinct patterns of theory-driven thinking to arrive at COA recommendations. Officers predominantly employ realpolitik beliefs, but more than a third of respondents justified their decisions in terms of either classic liberalism or moral reasoning. Most important, the theory an officer expressed correlates with whether he or she recommended the "stand firm" or "limited military strike" COA as the most effective response to an adversary's ambiguous provocation. Yet the content of an officer's theory-driven thinking does not correlate with either the conflict domain or the officer's Service branch. These results suggest that standard methods for improving creative thinking, such as increasing an officer's substantive knowledge base (via PME and assignment diversity) or relying on the diversity of technical knowledge and operational experience in decisionmaking groups (via an increased emphasis on jointness), are necessary but insufficient measures to foster the cognitive diversity and develop the creative options required to tackle complex problems. Instead, our findings point to the value of encouraging officers to periodically interact with well-informed individuals employing a variety of operative theories. Existing research indicates that such situations can induce surprise in officers, akin to "battlefield shocks," which subsequently allows them to confront their assumptions and the existence of other valid ways to make sense of a given information environment.[4]

Overview

This study was funded by a grant from the Defense Threat Reduction Agency's Project on Advanced Systems and Concepts for Countering Weapons of Mass Destruction to evaluate decisionmaking in a multidomain deterrence crisis. During the 2017–2018 and 2018–2019 academic years, 479 Active-duty officers attending a PME facility participated in a series of deterrence decisionmaking survey experiments. Participants were drawn from across a range of PME institutions: the Air War College (a senior Service school for lieutenant colonels and colonels) and the Air Command and Staff College (an intermediate Service school for captains and majors), both of which are located on Maxwell Air Force Base in Montgomery, Alabama; the Naval Postgraduate School (an intermediate Service school for captains and majors), located in Monterey, California; and several colleges at the National Defense University (intermediate and senior Service schools as well as a general officer program), located in Washington, DC.[5]

For the portion of the study presented here, we randomly gave respondents one of three short vignettes that had limited information about an emerging deterrence crisis. The underlying premise and fact pattern in each scenario were identical and represented a traditional extended deterrence crisis. Specifically, U.S. troops were stationed on allied soil with a publicly declared purpose to deter rival aggression. The scenarios described mounting tensions between the U.S. ally and the rival, precipitating a crisis and requiring a U.S. response. The only substantive difference across the scenarios was the conflict domain (conventional, nuclear, or cyber).

The vignettes described only the outlines of a plausible deterrence scenario, but they did not explicitly mention actual adversaries. This omission was deliberate and designed to limit the degree to which context-specific beliefs might influence an individual's decision in a limited information scenario. Participants were also explicitly told that the scenarios "were deliberately general and not about a specific issue in the news today." In one sense, this approach represents an extreme condition, as any real-world circumstance would include information about an adversary's motivation, capabilities, and national characteristics; however, as our interest was to tap officers' underlying operative theories, we sought to prevent preexisting knowledge about specific scenarios from contaminating our results. In addition, we were deliberately ambiguous about the adversary's ultimate motivations.

After describing the military provocation, we informed subjects that "intelligence analysts say they are unsure about what the action signals about the rival government's intentions." Specifically, subjects were told the adversary had mobilized forces, which could represent a political signal intended to

communicate dissatisfaction with the status quo or an "intention to take that territory from the ally." By deliberately withholding critical information about the adversary's intentions, our study forced participants to rely on their core beliefs and inclinations about conflict as a conceptual starting point to evaluate the competing COAs. We informed subjects that U.S. officials were considering two military responses to the adversary's actions: "stand firm," which reaffirms the deterrence commitment by materially enhancing the current military posture, or "limited military strike," which signals commitment via escalation by eliminating the specific capability deployed in the provocation. We then asked all participants to select one of the two COAs and explain the underlying rationale of their choices.

After the study, we developed a data coding framework to derive operative theories from respondents' written rationales. The open-ended explanations of how subjects arrived at their chosen COAs were categorized into one of three operational theories, each of which advances a distinct logic concerning the use of military force: realpolitik, classic liberalism, and moral reasoning. A team of coders independently evaluated and categorized each response. Explanations that included elements of multiple theories were coded only for the primary theory; the coders identified and resolved any coding discrepancies. We discarded a small number of responses either because they did not provide sufficient information to make an assessment or because it was impossible to determine the primary operative theory. Table 1 displays a summary description and an example of each concept.

Explanations were coded as realpolitik whenever participants arrived at their decision based on primarily military security considerations. Such explanations included references to risk and/or analysis of the military costs and benefits as well as comparisons of the two options' relative battlefield effectiveness. When officers employed classic liberalism, they explained decisions in terms of concern for international rules and norms; these responses often included discussion of legitimacy, diplomacy, negotiation, allies, precedent, and so on. When officers explained their decisions in terms of moral reasoning, the justification described how the United States should or should not behave considering the value of human life and objective notions of "right" and "wrong."

This research design facilitated the empirical examination of three questions: What is the relationship between an officer's operative theory and recommended COA? Does the distribution of operative theories expressed by the officers sampled vary by conflict domain (conventional, nuclear, or cyber)? Is there a relationship between the distribution of theories and variation in officers' Service branch? The following section overviews our findings on these questions.

Data Analysis

First, we examined the overall distribution of how respondents arrived at their chosen COA in terms of the three operational theories described above. As table 2 demonstrates, officers are not monolithic about operative theories when making decisions in limited information environments. Specifically, although most officers expressed realpolitik thinking in explaining how they arrived at their recommendation, nearly 40 percent of officers instead exhibited thinking based on either classic liberalism or moral reasoning.

Table 1. Summary Description and Example of Each Concept

Operative Theory	Logic	Example
Realpolitik	Explains decision in terms of military security considerations, including an instrumental assessment of the risks of incurring costs versus the potential for mission success.	"If we are certain that 2,000 of our people will be killed if we do nothing other than stand firm, we should attempt to save all of our people at the risk of losing some or else risk even greater losses in the future."
Classic Liberalism	Explains decision in terms of the potential consequences for broader nonmilitary concerns, such as international organizations, alliances, treaties, and economic arrangements.	"The future legitimacy and credibility of the United States (international reputation, national will, and other elements of national power are tied to this) may be jeopardized by an unprovoked attack."
Moral Reasoning	Explains decision in terms of the officers' personal sense of morality and values, where assessments of costs and benefits reflect their view of appropriateness.	"It would not be morally correct to conduct an attack unless the rival had intent, capability, and were highly likely to conduct an attack."

Table 2. Operative Theory Distribution

Theory	Percentage	Raw Total
Realpolitik	58	267
Classic Liberalism	28	130
Moral Reasoning	11	53
Unable to Categorize	1.9	9

Marine Corps officer candidate with Recruiting Station Riverside, 12th Marine Corps District, notes key factors from five-paragraph order before briefing his fire team on how to overcome Leadership Reaction Course obstacle at Marine Corps Base Camp Pendleton, California, April 10, 2021 (U.S. Marine Corps/Tessa D. Watts)

Second, we needed to determine whether the content of a person's theory-driven thinking corresponds to the COA he or she recommends. To do so, we examined the relationship between a subject's foundational beliefs or theory and the substantive recommendation (limited strike versus stand firm). The results summarized in table 3 reveal a substantively meaningful and statistically significant relationship between operative theory and recommended COA. Specifically, though realpolitik was by far the dominant framework for those recommending limited strike (89 percent), it was less influential (55 percent) for those who recommended stand firm. In addition, officers who relied on classic liberalism were more than three times as likely (32 percent versus 10 percent) to recommend standing firm over a limited strike. Finally, although the logic of appropriateness exhibited in moral reasoning was the least frequently employed, it was associated with the most significant percentage difference between those who recommended stand firm versus limited strike. Notably, the relationships conveyed in table 2 meet accepted levels of statistical association and are therefore unlikely to be an artifact.[6]

Third, we asked whether the operative theory an officer employs to make sense of limited information varies based on the conflict domain. Table 4 addresses this question by presenting the relationship between the fundamental beliefs one employed and the conflict domain presented in the decision experiment. In short, the answer is *no*. Officers tend to employ realpolitik the most across all three conflict domains. And while data do show greater reliance on classic liberalism in the cyber

Table 3. Operative Theory by Recommendation

Theory	Limited Strike (%)	Stand Firm (%)
Realpolitik	88.5	54.8
Classic Liberalism	9.8	31.9
Moral Reasoning	1.6	13.4

Table 4. Operative Theory by Domain (%)

Theory	Nuclear	Cyber	Conventional
Realism	60	52	65
Liberalism	29	36	23
Constructivism	11	13	12

Military Academy at West Point held its graduation and commissioning ceremony for Class of 2021 at Michie Stadium in West Point, New York, May 22, 2021 (U.S. Army/Tyler Williams)

domain—specifically, subjects showed concern about the legal status of the adversary's cyber attack—this relationship does not reach commonly accepted levels of statistical significance.[7] In sum, the consistency of officers' theory-driven thinking employed across all three domains suggests a lack of flexibility, as we have defined the term. Although each domain—conventional, nuclear, and cyber—presented a distinct set of facts on the ground that should inform how one evaluates the COAs, it appears that those domain-specific facts did not elicit any variation in the operative theory officers employed.

Finally, we wanted to determine whether the operative theory an officer employed varied based on his or her branch of military Service. We answered this question by calculating the distribution of operational theories across Service branches. Table 5 shows that most officers in each branch relied on realpolitik reasoning to arrive at their recommended COA, which was followed in turn by classic liberalism and moral reasoning. Although officers do exhibit some minor within-framework differences across Service branches, these differences are not statistically significant.[8] In other words, we do not observe across the Service branches substantive variation concerning the distribution of operative theories deployed in limited information environments. This finding suggests that ensuring jointness in decisionmaking groups will not necessarily provide the diversity in operative theories required for critical and creative thinking when officers evaluate competing COAs.

Together, the results from tables 2 and 3 establish an empirical link between the diversity of operational theories and the breadth and substance of the recommended COAs. Consistent with previous research on the role of background beliefs, these results confirm the initial belief framework that individuals bring with them to confront a new circumstance powerfully shapes their substantive recommendations.[9] It follows that critically and creatively evaluating competing COAs in situations of limited information requires employing a diverse set of operative theories. Moreover, harnessing those diverse perspectives requires a decisionmaking group composed of individuals who are both self-aware about the theory motivating their thinking and flexible in their capacity to make sense of the same information environment in the context of multiple theories.

Implications

In the opening stages of a deterrence crisis, an officer's operative theory shapes the COA recommended. There is also strong evidence that the theories officers employ remain consistent across conflict domains, which is to say that officers do not appear to exhibit different patterns of theory-driven thinking as conflict shifts between conventional, nuclear, and cyber. Moreover, data show no relationship between variation in operative theories and Service branch.

What are the implications of these findings? How can they shape strategies to improve creative thinking capacity within the officer corps? Three critical implications follow from this study. First, teaming is paramount. Deterrence challenges are complex and defy any single model, and results suggest that individuals tend not to leverage multiple operative theories. Therefore, critically and creatively evaluating potential COAs requires a *group* of individuals who possess both an awareness of their own operative theory and an ability to deliberate with those working from different theories. Second, even when a group's members engage with different operative theories, they will tend to engage in a "dialogue of the deaf" about the nature of the threat at hand and how best to proceed. Commonly employed strategies to improve a group's capacity to generate and evaluate COAs—for example, PME, assignment diversity, and jointness—do not necessarily foster the self-awareness and flexible use of operative theories required for individuals to deliberate with others operating from different theories. Third, experiences that simulate surprise, in which a person must confront both the assumptions driving his or her thinking on an issue and the existence of other valid ways to understand that issue, can foster the self-awareness and flexible thinking needed to deliberate with other group members.

Decisionmaking teams are essential to evaluating COAs during a deterrence crisis. Optimally, a military officer could respond to the incomplete and ambiguous information that typifies such situations by engaging in flexible thinking that examines the risks accompanying each potential COA comprehensively. Recall that in this context *flexibility* refers to the capacity to employ an operative theory while remaining open to new information and alternative interpretations of that information to arrive at a nuanced and conditional judgment about which COA to pursue. It follows that the key to creative thinking lies in making officers more self-aware about the theories driving their own views as well as better able to recognize and engage the relative merits of judgments arrived at by processing information through the lens of different theories.

Unfortunately, existing research demonstrates that, regardless of intellectual ability or level of subject matter expertise, all people tend to fall short of these ideals to some degree. For example, even foreign policy experts tend to arrive at judgments on how best to proceed by persistently employing a single operative theory, and they typically ignore other viable ways of viewing the situation.[10] Judgments that result from inflexible theory-driven thinking tend to narrowly interpret some portion of the information available, disregard seemingly contradictory information, and dismiss interpretations of information that proceed from different operative

Table 5. Operative Theory by Service Branch (%)

Theory	Army	Marines	Navy	Air Force
Realpolitik	55	58	65	54
Classic Liberalism	33	30	21	36
Moral Reasoning	11	12	13	10

theories.[11] These tendencies—which buttress resolve but erode flexibility—hinder creative thinking at both the individual and group decisionmaking levels.

Moreover, a group populated by individuals operating according to a single operative theory has little capacity to fully assess adversary threats and select the most effective COA. Like-minded theory-driven thinkers tend to coalesce and succumb to the framing bias, advancing a single, narrow interpretation of the incomplete information at hand.[12] To the limited extent that such groups engage in conversation with others who use differing frames, a dialogue of the deaf about the nature of the threat at hand and how best to proceed tends to result. Consequently, a state beset by such thinking risks responding to an adversary's provocation inefficiently, erroneously, or with such delay that it misses its window of opportunity.

Commonly employed strategies to improve a group's capacity to critically and creatively evaluate COAs (for example, PME, assignment diversity, jointness) do not necessarily foster the required levels of self-awareness and flexible thinking. PME can improve an officer's historical knowledge, understanding of operational concepts, and critical thinking. Ensuring that officers experience a range of assignments broadens their understanding of the problem and the various components of a military response; likewise, ensuring jointness within decisionmaking groups helps them comprehensively assess the operational strengths and weaknesses of COAs. Yet none of these strategies necessarily increases the diversity of operative theories expressed or aids teams with devising creative options required to tackle complex geopolitical challenges. Specifically, our findings show that the content of an officer's theory-driven thinking does not correlate with either conflict domain or Service branch. For this reason, leaders should not assume that different operational experiences or Service perspectives will aid them in flexibly employing multiple theories to understand the full range of consequences of an adversary's ambiguous provocation.

Finally, capacity for self-awareness and flexibility can be improved by presenting officers with situations that generate surprise. General David Petraeus, USA (Ret.), advocated for initiating conditions that mimic the effect of battlefield surprise to improve the ability of officers to identify their operative theory and recognize the merits of perspectives generated by employing different theories. Consider Petraeus's reasoning for sending military officers to public graduate schools: "It teaches you that there are seriously bright people out in the world who have very different basic assumptions about a variety of different topics and therefore arrive at conclusions on issues that are very, very different from one's own and very different from mainstream thinking, particularly in uniform."[13] In short, interaction with people from other communities encourages individuals to reflect on their own heretofore unstated assumptions about how the world works.

It follows that a diverse group of self-aware theory-driven thinkers stands to improve the creativity of decisionmaking by facilitating *joint evaluation*. Existing research attests that joint evaluation, or the simple step of presenting a person with multiple sets of beliefs or theories, to frame the same set of information at the same time, can, at minimum, make people more attuned to information that contradicts their own operative theory. This approach inoculates decisionmakers against various forms of framing[14] and minimizes the tendency toward overconfidence that theory-driven thinking often produces.[15] In this vein, one way of encouraging officers to practice joint evaluation could be for the Department of Defense to host recurring closed-door, not-for-attribution workshops with an array of people. Introducing military officers to people from other groups with whom they may not be familiar (for example, scientific and strategic experts from the arms control community) can generate that sense of battlefield surprise described by Petraeus. The objective is for participants to become more self-aware about the critical role operative theories play in shaping human judgment, inoculate policymakers from the effects of narrowly framed assessments, and facilitate the creation of a wider array of options. Meeting the Joint Chiefs of Staff 2020 directive entails, in part, understanding the limits of human cognition and working around those limits to build teams that think critically and creatively to apply military power to the rapidly changing 21st-century threat environment. **JFQ**

Notes

[1] Jim Garamone, "Joint Chiefs Vision Changes Military Education Philosophy," *DOD News*, June 1, 2020, available at <https://www.defense.gov/Explore/News/Article/Article/2204041/joint-chiefs-vision-changes-military-education-philosophy/fbclid/IwAR3Sr_PiufeQnpBItwlBHKCAqL4pi__s5a_68vtSTje4_5O4WhYtLYkbD-Y/>.

[2] Philip E. Tetlock, "Theory-Driven Reasoning About Plausible Pasts and Probable Futures in World Politics: Are We Prisoners of Our Preconceptions?" *American Journal of Political Science* 43, no. 2 (April 1999), 335–366.

[3] Philip E. Tetlock and Dan Gardner, *Superforecasting: The Art and Science of Prediction* (New York: Broadway Books, 2016).

[4] Ibid.

[5] Participants from the National Defense University included CAPSTONE fellows as well as students from National War College, Dwight D. Eisenhower School for National Security and Resource Strategy, and students from intermediate-level education programs at the Joint Forces Staff College.

[6] X^2 (2, N = 450) = 25.2, p = 0.00.

[7] X^2 (4, N = 450) = 6.58, p = 0.160.

[8] X^2 (6, N = 450) = 9.41, p = 0.151.

[9] See, for example, Robert Jervis, *Perception and Misperception in International Politics: New Edition* (Princeton: Princeton University Press, 2017).

[10] Richard K. Herrmann and Jong Kun Choi, "From Prediction to Learning: Opening Experts' Minds to Unfolding History," *International Security* 31, no. 4 (Spring 2007), 132–161.

[11] Tetlock, "Theory-Driven Reasoning."

[12] See, for example, Irving L. Janis, *Victims of Groupthink: A Psychological Study of Foreign-Policy Decisions and Fiascoes* (Boston: Houghton Mifflin Company, 1972).

[13] Tetlock and Gardner, *Superforecasting*, 225.

[14] Dennis Chong and James N. Druckman, "Counterframing Effects," *The Journal of Politics* 75, no. 1 (January 2013), 1–16.

[15] Hal R. Arkes, "Overconfidence in Judgmental Forecasting," in *Principles of Forecasting: A Handbook for Researchers and Practitioners*, ed. J. Scott Armstrong (New York: Springer, 2001), 495–515.