Routledge
Taylor & Francis Group

When generals consume intelligence: the problems that arise and how they solve them

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ABSTRACT
Strategic intelligence is a critical input to national security decision-making. Research indicates decision-making is negatively affected when strategic intelligence creates cognitive problems. In this qualitative study, the opposite was found to be true. Twenty-one very senior landpower generals with command experience in Iraq and Afghanistan were interviewed. Their problems with strategic intelligence – resulting from their perceptions of contradictions – had a positive affect on decision-making. The generals resolved problems using a three-prong, socially embedded, hierarchically diverse, problem solving strategy consisting of self-learning, learning from others, and mentoring others. Such a strategy could be incorporated into professional military education throughout an officer's career.

American national security leaders have used strategic intelligence extensively since World War II, most recently in Iraq and Afghanistan.[1] Strategic intelligence is information intended to meet the needs of the most senior national security decision-makers such as the president of the United States, the National Security Council, the secretary of defense, combatant commanders and senior military leaders.[2] The responsibility for how strategic intelligence is used in a military operation resides with its commanding general. This responsibility is especially challenging because a key dilemma a commanding general faces is the lack of experience with strategic intelligence, an experience usually gained upon reaching senior general officer ranks.[3] This lack of experience sets up the potential for failure if intelligence is not used effectively.[4] Such potential raises the question of how exactly do commanding generals consume strategic intelligence. To shed light on the potential impact of this lack of experience, I conducted a study to find out what problems general officers experienced when they consumed intelligence, and their problem-solving strategies they used, if any.

I interviewed 21 senior landpower generals with post-2003 field experience as commanding officers in Iraq and Afghanistan. The commanding generals did face problems with the intelligence. Specifically, they experienced a number of contradictions between what the strategic intelligence suggested and what they believed prior to receiving the intelligence. The commanding generals wrestled with these contradictions. These contradictions acted as catalysts, triggering a three-prong, socially embedded, problem-solving strategy that positively affected decision-making. The strategy involved the use of self-learning through critical thinking and inquiry-based dialogue – dialogue that sought to uncover assumptions and evaluate their validity – feedback from others, and mentoring to others.[5] The study results challenge the existing view that cognitive problems created by intelligence, such as contradictions, have a negative effect on a leader's decision-making.

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Building on the literature, I define contradiction as a conscious recognition by an individual experiencing a situation when new events or new information means something opposite to an individual's preexisting understanding of the world, regardless of what we name that understanding, be it knowledge, opinion, or thinking.[6] I use the word contradiction synonymously with cognitive dissonance, inconsistency, disconnect, and conflict. There is no agreed-upon definition of critical thinking in the scholarly literature but, in general, critical thinking is needed to understand the world when clarity is either absent or even if clarity is present when it is intentionally or unintentionally erroneously misplaced by simplification.[7] Self-learning is defined as an individual's self-initiated efforts to wrestle with divergent problems such as contradictions, which then leads an individual to creative insights and cognitive breakthroughs.[8]

What we know

The national security literature identifies contradictory information as a liability for effective decision-making, resulting in either the rejection or distortion of the contradictory information.

Rejection of Information

Bazerman's research on the confirmation trap bias states that we usually look for confirmatory data to support our belief when making a decision, and as a result, reject contradictory data.[9] Handel tells us that when information contradicts what a leader knows, he or she is quick to reject the information, especially when the information might identify flaws in decision-making.[10] Deutsch, in his seminal study of World War II generals and intelligence, found that certain commanding generals rejected intelligence.[11] For example, British General Archibald Wavell, once his mind was made up, was not able to accept contradictory intelligence because it may have questioned operational decisions he had made. Davies informs us that World War II generals needed a mix of intuition and intelligence to make good decision, but that if intuition were relied on too much, intelligence would be ignored, especially when intelligences conflicted with the general's ideas prior to receiving intelligence.[12]

Jervis, in analyzing policymakers and their relationship with intelligence, exposes the conflicting dynamics between the two communities. Policymakers have their views about the world and are skeptical about intelligence analysts, who live in a different world and have different interpretations. Consequently, policymakers have a tendency to reject intelligence.[13] In addition, policymakers need confidence in order to shepherd their interests forward but intelligence can be too complicated and ambiguous, and therefore be rejected.[14] Leslau, drawing from studies in psychology and political science, suggests that the character of decision-makers will influence their reaction to intelligence; when they are not willing to listen to different opinions than their own, the intelligence will be rejected.[15]

Distortion of information

Jervis also informs us that far too much scholarly effort to date has been focused on cognitive biases and how they drive decisions, and that emotive biases can cause distortions of facts.[16] Walker, in his analysis of President Woodrow Wilson's decisions at the end of World War I, explains that Wilson's need-for-power and achievement motivations distorted information provided to him, resulting in closed-minded behavior and a flawed decision-making process.[17] According to Walker, these emotional factors played a significant role in reducing the effectiveness of the League of Nations.[18] Bar-Joseph, in his study of the intelligence failure of the 1973 Yom Kippur surprise attack by Egyptian and Syrian forces on Israel positions, cites psychological studies of how individuals are reluctant to deviate from the status quo, and will reinterpret and distort inconsistent information so that it matches previously held beliefs.[19]

Gookins informs us that consumers of intelligence – policymakers and decision-makers – are subject to mindset biases that can distort information leading to misinterpretations such as faulty inferences, erroneous consequences, and inappropriate reactions.[20] Immermann draws from cognitive psychology

that once a national security decision-maker has a belief, he or she is inclined to reinforce that belief.[21] Further, if we cannot stop receiving or processing the new and unfamiliar information, we might ignore it, but when new information is so opposite to our perceptions, or contradictory to what we know, we can often misrepresent it.[22] Houghton states that we hold on to our existing beliefs and preconceived ideas, and that when new information challenges our beliefs, we unconsciously reinterpret the new information as something different in order to maintain our existing beliefs.[23] Fiske and Taylor, who focus on the relation between cognition and information from others, report that in situations where our understanding is not consistent with the information presented to us, we will reshape the incoming information to create a better fitting conception of the contradictory information presented to us.[24]

Few empirical studies

Unfortunately, the last time an empirical study analyzed generals and the use of intelligence was of deceased World War II commanding generals, conducted by Deutsch in 1988; his historical study primarily used 45-year old documents from World War II.[25] More importantly, the focus on these World War II generals was not on the problems generals faced consuming intelligence, rather it was the re-evaluation of Allied operations based on newly uncovered Ultra intelligence. The 1970's public release of Ultra intelligence – the British capability of code-breaking German encrypted radio and teleprinter communications during World War II – made such a retrospective reevaluation possible.[26]

When most scholars and practitioners of intelligence use the word 'consume' they refer to the outcome of having used intelligence.[27] Little, if any, research exists into the process of "consumption" in the national security literature.[28] When I say, "consume," I mean the sequence of actions and behaviors that occur during a face-to-face interaction between an intelligence officer and a commanding general, whether verbally, in writing, or using visuals.[29] Because such little empirical and systematic attention has focused on the problems general officers face when consuming intelligence, or how general officers resolve these problems, a research study is justified.

Research method

Qualitative method

I selected a qualitative method for this study. Most social science and management research, however, does not use qualitative methods; rather, they use quantitative methods such as surveys and experiments. Quantitative methods are appropriate for testing hypotheses, which assume an understanding of existing conditions. However, in this study, I am not testing hypotheses, because little, if any, knowledge exists about the specific context of the problems commanding generals' face when consuming strategic intelligence. This means I need to first build a body of knowledge. Building a body of knowledge requires a deep understanding of contexts experienced by individuals, and this type of knowledge is best surfaced by qualitative research methods.[30] Context is critical.

Of the qualitative methods available such as ethnography, action research, case study and grounded theory, I selected grounded theory because it offers the best approximation to understanding context that one would otherwise only achieve by real-time observational research.[31] Grounded theory is the systematic construction of theory from data using abductive reasoning, which utilizes both inductive and deductive thinking.[32] Of note, the national security intelligence literature has recently used grounded theory to deepen counterintelligence and counterterrorism analysis, and better understand briefer-to-policy-maker interactions.[33]

Charmaz's application of grounded theory, in particular, is used in this study because it seeks to understand the world as the interviewee sees it by focusing on contexts of actions and interactions based on the interviewee's use of terms, retelling of situations, events, assumptions and meanings.[34] In addition, I use a key feature of grounded theory, the use of theoretical saturation, which means there is no need to produce or count the total number of times a behavior is demonstrated across interviews.

I consider the counting of significant coded meanings as comprehensive and complete when '… fresh data no longer sparks new theoretical insights, nor reveals new properties or these core theoretical categories'.[35] When theoretical saturation is reached for any particular aspect of the research problem, new focus areas are explored until they become saturated.

Data collection

Interviewing decision-makers is a scientifically valid method for gaining insight into their information processing needs and behaviors.[36] I interviewed 21 landpower combat arms general officers at the rank of Lieutenant General (i.e., 3-star) and General (i.e., 4-star), of which 12 were 3-star generals and 9 were 4-star generals. Of the 21, 11 retired between 2012 and 2014, six retired between 2008 and 2011, one retired prior to 2008, and three were on active duty.[37] The interviews typically lasted 45 min. The generals were guaranteed anonymity. When asked to reveal what they considered their main warfare specialty, 13 were infantry, seven were armor, and one was an engineer.

The key interview questions were: 'Thinking of an organizational assignment you had while a 3- or 4-star general, how did you interact with national-level intelligence systems, processes, and/or agencies?' and 'With regard to these assignments and national-level systems, processes, and/or agencies, what knowledge gaps were apparent by you?' The interviews were conducted between July 2015 and January 2016, some in person and some over the phone, using a snowball approach where each general recommended others to be interviewed.[38]

Some generals I interviewed stated they knew other commanding generals with post-2003 Iraq and Afghanistan experience who did not face the kinds of problems they experienced dealing with intelligence, nor use the problem-solving strategies they employed. Those interviewed said these other generals delegated the responsibility to deal with understanding and using strategic intelligence to their subordinates, their chiefs of intelligence. I did not interview these other generals as it was beyond the scope and duration of this study.

All generals I interviewed had commanded large units in wartime Iraq and Afghanistan. Examples of the organizations they commanded included Central Command, International Security Assistance Force, Multinational Force-Iraq, Army Central, various corps-level commands, and assorted combined joint task forces. All generals were graduates of a senior service college: 11 from the Army War College, six from the National War College, three from the Naval War College, and one from the Air War College. Some Army generals highly recommended specific senior Marine Corps infantry generals be included in the study because of shared battlefield experiences in Iraq, whom they considered equally capable of contributing to the landpower-focused research. As a result, of the 21 landpower generals, 18 were Army generals and three were Marine Corps generals.

Data analysis

In grounded theory, the researcher assigns meanings to the interviewee's words and sentences by labeling them with named codes. Codes are not predetermined, as the case with quantitative methods; rather, codes emerge as the researcher interacts and reflects upon the data and their meaning.[39] There are three levels of coding and I used two criteria to judge the effectiveness of coding: fit and relevance.[40]

In the first level of coding, fitness involved whether my interpretation of data fit the empirical world, and relevance involved whether my interpretation captured the relationships between processes. For the first level of coding of the interview data, I identified 449 coded phrases or sentences. In the second level of coding, I synthesized the individual codes into larger categories. I made decisions about which codes had similar meanings in an analytic sense. During the second level coding, I often revisited first level codes, as part of an iterative process, to ensure I captured the interviewee's meaning. In the second level, I categorized them into 18 concepts. The third level of coding was the most important as it further grouped the larger number of second level categories into fewer theoretically based concepts from

which the literature had previously defined and investigated. In the third level of coding, I categorized the 18 concepts from the second level into four factors: contradiction; self-learning through critical thinking and dialogue; feedback from others; and mentoring others. I did not use a preconceived framework to identify the third level of coding. Next, the results are discussed.

The problems generals experienced

The commanding generals I interviewed acquired strategic intelligence through a combination of written narrative authored by an intelligence officer and via live interaction in person or by phone with an intelligence officer. The generals discussed four types of conditions where contradiction surfaced: between differences in what analysts reported on intelligence sources and what generals personally knew about these same sources; structural dynamics leading to analytic differences in interpretations of generals and analysts; between differences in Washington, D.C. intelligence agency cultures; and between differences in Washington, D.C.-based intelligence and field operational leadership.

The quotes below are tagged by a unique structure: CGX***, where CG stands for Commanding General followed by a digit (X), referring anonymously to a specific general, numbered 1 through 21, then using three or four asterisks indicating the rank of the general, either a 3-star or a 4-star general. For example, CG8**** would be the commanding general identified as number eight who held a 4-star rank.

Problems

Conflict between intelligence sources and what generals knew or wanted to know
As an example, quite often, the commanding generals knew first hand foreign national leaders that analysts in Washington, D.C. studied. Regardless of the intelligence source used by analysts, there were times when information in the intelligence reports about the foreign leader did not mesh with the general's personal knowledge of these foreign leaders or the situation on the ground. Similarly, generals did not receive information for what they felt they needed to know.

> (CG3****) I remember visiting a signals intelligence collector near Baghdad. They were collecting much more infor-mation than what is needed to identify and track a target. What I needed to know was, what was the mood of the community? How were people feeling? These questions were lost on the intelligence guys. We forget what should be included in a PIR (Priority Intelligence Requirement). What I need may not lead to a target, but it could help a commander, which is critical. The people in the community, their mood gives insight. Did we give what people needed? There are many non-kinetic PIRs but we focus on the kinetic ones.

> (CG4****) Sources are the fundamental problem. Here is a classic example. It is about Iraq and Chalabi. I went to regional leaders, and foreign leaders to ask about Chalabi's credibility and they had nothing good to say but Washington said he was good. I did not trust their (i.e., the intelligence analysts') sources.

Disconnect between analytic processing and interpretation
Commanders saw the underlying structural dynamics within organizations that lead to conflicts in knowledge production and interpretation. These included the balancing of vertical and horizontal integration flow of knowledge within and across organizations, as well as analytical effort of data fusion. Fusion is the '… deliberate and consistent process of collecting and examining information from all available sources and intelligence disciplines to derive as complete an assessment as possible of detected activity'.[41]

> (CG9***) We would want to focus on the most important thing, whether it is nonproliferation, deployments, offen-sive/defensive systems, or consequence management. If you cannot envision the whole, how the organism works, then you cannot figure out what to focus your operations on, to get at the most important thing. I found that there is not a holistic understanding by intelligence agencies, which I could relate to. The nuclear venue discusses the nuclear issue but they do not understand how the other systems relate, there is no lateral integration. For small countries, they have to leverage what they know in one system for the other. For large countries like Russia or China, they can have separate whole systems. Small countries cannot. Agencies lack the vertical integration.

(CG21***) We need to re-learn how to do fusion. We spent years going after people, where the focus of the effort was identifying the person and where they were, like looking for a target. But we have to learn how to fuse data against a thinking enemy, this is especially important with the shift of the Army Operating Concept.[42] How do you fuse data so you can confirm or deny what is happening to a thinking enemy?

Conflicting intelligence agency cultures

One of the most emotional disconnects for the generals was the realization that different organizational cultures at times lead intelligence agencies to be biased to report on information that they felt should have been consistent between agencies, but were not.

(CG8****) I had to learn the hard way that the most important thing you had to know when dealing with intelligence was the culture of the agency. They have different goals. You have to understand their goals and culture in order to understand what they are saying, and how to interpret what they are saying. I often felt that what they believed (their goals) were in contradiction with each other and you have to know that, see that, in order to use the intelligence they gave you.

(CG19***) Each intelligence community element has a culture. The culture is only mildly affected by the leader. Those leaders come and go. But the culture persists. At the DIA (Defense Intelligence Agency), it is constituted to prevent strategic surprise. That means they do not focus on tactical warfighting, tactical contexts, which I mean at the Division and below. They had few experts, little interest or focus at the tactical level. CIA (Central Intelligence Agency) is overly focused on technical means because of its satellite capability for imagery and their human intelligence. But what they won't tell you is that a lot of human intelligence is very questionable. That human intelligence is briefed as a fact. The NGA (National Geospatial-Intelligence Agency) gets high marks. They are most cooperative. They have front-end lead, and they are very adaptable. It would be very helpful if a 3- or 4-star knew how to make the imagery sausage [i.e., how the raw satellite image is initially processed and then interpreted]. Only then do you know what to ask for. Take the Army G2/INSCOM (U.S. Army Intelligence and Security Command). They were pretty responsive, but most defaulted to the direction of the senior commanders in the field. They were influenced politically. The G2, very few times did they buck the commanding general.

Inconsistency between policy leaders in Washington, D.C. and the field

Perceptions by national security leaders in Washington, D.C. of what was happing in the field was, at times, inconsistent with what field commanders assessed to be the reality in the field. These differences, when surfaced to the generals, were a source of cognitive friction.

(CG4****) Another example is the 2-star at Central Command. He told me what was being touted at PC (Principal Committees) and DC (Deputy Committees) meetings. I talked to the J5 on the Joint Staff daily, before he attended these meetings. Things were reported in these PC and DC meetings that were totally different than what was known to me on the ground.

(CG8****) There were things known about Pakistan in Washington but they did not get to me until after the fact. It would have been helpful if I knew about the Pakistani conversations sooner. As the commander, I don't think anyone in my command shortsighted me. People were trying to do their job. But Washington was so consumed whether what they were doing in Iraq was right, that when I asked questions of them, I could not get an answer. They might not have the answer. I wanted to know what the Pakistani's were doing. I told this to my boss, who told me he was having the same problems getting answers from Washington.

(CG14****) In Afghanistan, the biggest gap was the difference in how the CIA and the NSA (National Security Agency) interpreted the Iraqi leaders versus what my people and I saw on the ground. I spent a lot of face-to-face time with analysts to deconflict the differences. For example, there was an Iraqi minister and he told me he had to go to Russia for a meeting. He said he wanted to first get permission from the United States. Then he tells every US actor about it because he wanted to make sure that intelligence agencies did not report his visit and then Washington policymakers get the wrong impression that he is going soft on Russia.

Problem-solving methods generals used

In response to these problems, the general officers used a combination of self-learning, feedback from others, and mentoring others to resolve the problems they experienced.

Self-learning

How generals individually resolved these problems – i.e., contradictions – involved three factors. First, triggered by the contradictions they experienced, generals were motivated to use self-learning to resolve them. Second, they named and described the use of critical thinking as the cognitive mechanism they employed in self-learning, techniques that involved questioning themselves, and engaging in inquiry-based dialogue, that is, dialogue not for the purpose of being an inquisitor to others but dialogue for the purpose of raising questions and assumptions in others, and ultimately in themselves. Third, there were intentional reasons that caused them to think critically to resolve these contradictions, reasons that involved strategy execution and saving the lives of their soldiers. Generals said that by making use of 'asking questions', they surfaced the full extent of contradictions and their resolutions, leading to improved critical thinking.

There were seven reasons why generals said they needed to use self-learning to resolve contradictions: navigate policy differences; understand intelligence organization processes; be a driver of intelligence; operate in the human dimension; resolve multiple analytic differences; generate multiple analytic perspectives; and understand intelligence technical capabilities and limitations. These reasons are discussed in detail next.

Navigate policy differences

The generals felt that policymakers in Washington, D.C. sometimes espoused national security policies that generated questions in the minds of the generals; these policies created inconsistencies for them and made it difficult for them to identify intelligence requirements. The reason generals felt it was important to resolve these policy inconsistencies to ensure they knew what questions to ask senior policymakers.

(CG5***) I was trusting, maybe naïve. Intelligence informed me that Iraq had weapons of mass destruction and they were building a case to go to war. If I had better understood intelligence, I would have asked tougher questions. I may have made a difference.

(CG6****) When I would go to the White House, I was accused of overstating the [insurgency] threat [in Iraq]. You have to have a deep understanding of the threat, to evaluate the intelligence you are given by the intelligence guys, because the civilian leaders in the White House don't want to hear bad news. I needed to be able to ask the right question. That is the key. You need to understand the problem set. You have to challenge every assumption, as well as the data that forms the intelligence.

(CG8****) I would have a conversation [about Iraq] with the Undersecretary of Defense for Policy. I knew what was said, what I was expected to do, whose authority a decision was based on. But then a month or two later, someone one or two levels below him, his emissary, would have a conversation with me and it would be a completely different conversation than what I had with the Undersecretary The problem, I know exactly what it is. When you have people in the chain of command, when there are changes in staff within the chain of command, these subordinate policy advisers say things but do not commit to anything, and refuse to say where their authorities or direction comes from. I thought we were aligned in Washington DC. I realized we were not. I knew what questions I should be asking. But you know since I have been retired, I have been thinking about this and I should have been asking more questions, all the time, every time.

Understand intelligence organization processes

The generals had rarely, if at all, been exposed to strategic intelligence or its use in wartime prior to their experiences in battle as 3- and 4-star commanding generals. They were not familiar with the information flow or where data fusion processes took place by intelligence agencies and how these agencies extended their processes into the field. They needed to resolve disconnects in order to be an effective user of intelligence.

(CG12****) First, understanding the access I have available to use in the field. What is the intelligence organization in the field? I had CIA and DIA guys. There was a team in country that analyzed Iranian influences. I didn't find out about them until 18 months into Iraq. It was every man for himself.

(CG16***) How do you get the intelligence, that's what is most important? What I mean by that is, how to get the agency and the process to work on your problem?

(CG20***) It was my second time in Afghanistan and I had deployed four times to Iraq. I had my intelligence team but we also had several embeds including DIA, CIA, and also the FBI (Federal Bureau of Investigation), some virtually. It was a challenge for me to get the whole picture. The biggest thing I wondered about was how the intelligence fusion took place.

Be a driver of intelligence

The generals said that in their professional development as a combat arms officer, they were the recipients of intelligence. Because their experiences with strategic intelligence occurred late in their careers as senior commanders in wartime, these generals came to see an additional role develop for themselves, as 'drivers' of intelligence. Being a driver of intelligence means the national security leader has the responsibility to identify the intelligence requirement and does so while adapting to the changing external environment.[43] Effective national security decision-making fundamentally relies upon such leaders driving intelligence, and resolving contradictions helped ensure their effectiveness as drivers of intelligence.

(CG3****) In nonlinear wars all the officers need to understand national intelligence whereas in linear, traditional state-on-state wars, it is okay for just the military intelligence officers to understand national intelligence. In linear, there is a physical line that separates both sides. Nonlinear war is where the people are involved, not just the military, there is no line.

(CG4****) Today, there is a culture where the commander is a consumer of intelligence, unfortunately. The commander is more likely to be thinking that his intelligence staff's purpose is to fit the intelligence into his operational purpose. They don't see the integration. It has to be part and parcel of the whole operations. They want the staff to shout out what the commander wants supported, rather than what conditions on the ground warrant, what the reality is actually is showing.

(CG10***) The issue is how to be both a consumer of intelligence and a driver of intelligence. Assuming you have inquisitive commanders, it's not about problem solving. It's about co-producing and co-consuming.

Operate in the human dimension

Conflicts prior to 2003, by and large, involved US and allied military forces against a state's military forces, the 'state dimension'. These generals I interviewed were fighting battles in a land environment in Iraq and Afghanistan where both state and non-state actors were key players. In addition, the battlespace was far different from the open spaces where battles have traditionally been fought, that is, fighting was now in cities amidst civilians. Changes in the character of war became so critically important, now including the cognitive, cultural, ethnic, and religious dimension. The generals called this collective character the 'human dimension', which includes both state and non-state actors. Resolving inconsistencies between viewing war as a 'state dimension' vs. a 'human dimension' was important from a policy and strategy alignment perspective.

(CG1***) I must warn you that some general officers will have very different views than me. But I was told frequently by my intelligence officer to 'just ask the question and we'll get the answer.' But, I never got the right answer. My questions dealt with the human dimension. In all future conflicts, we have to know about culture, tribes, motivations, and the psychological and sociological drivers. But that is not what intelligence is providing. We have to fight using this human dimension.

(CG6****) For the threat, the key is understanding how the state works. How does that state function at the leadership level? You need a deep understanding of their decision-making process. Obviously, you need to know their capabilities – the equipment, hardware, that sort of thing – I am not talking about that. You need to know their command and control, how they make decisions. How does their sphere of influence work? In Iraq, we had wire diagrams but that is not what I am talking about.

Resolve analytical differences

Generals understood that intelligence officers can disagree on how they interpret intelligence data. Nevertheless, when these interpretation inconsistencies took place and the generals attended to them, the generals were motivated to use critical thinking to resolve them.

(CG14****) My G2's were good at sniffing out the differences, when there were differences in these viewpoints. They would monitor what was going on. I would learn from it, which kept me paying attention to it. If I weren't proactive in fixing these potential misinterpretations, I would be crucified. If I could soften it, that would save a lot of trouble from starting.

(CG18****) You have to know how to work with intelligence. You have to know what the intelligence 'knows' and what they are speculating. You have to know the difference between knowledge and speculation. You have to be able to assess the critical thinking of the intelligence officer.

Generate multiple perspectives

Other times, the generals were motivated to use critical thinking to generate additional interpretations because the intelligence presented to them provided a conclusion that was insufficiently narrow in their mind, that other options or alternatives were needed to either explain or act. Generals could see other possibilities but the limited view they saw in the intelligence created an inconsistency they needed to resolve.

(CG9***) I needed a conceptual understanding. The problem was that people are focused on the day-to-day events, the procedural things, like the tactical things, the crisis focus, the problem de jour, rather than the whole system. In other words, how the whole system works instead of where the pieces work. Building, knowing from the bottom, from the specialized pieces is lacking. We break things down to understand the pieces but do a bad job of integrating them back up. I mean some people used a 'red-team'[44] but that was mainly for an operational focus. We need to be able to rearrange things differently, to get different perspectives, and we need to provide incentives to do this, to reward people for this.

(CG11***) Intelligence is really important because it is related to decisions that the commander has to make. What is the enemy doing? What are our own forces doing? What are my options? That is what intelligence is for; it is to understand how options can be pursued. We don't think like that unfortunately. We are not connecting strategic intelligence with decisions and operations. I had a friend who told me there are three types of people: those who create options; those who sustain options; and those who give away options. Those who give away options should be fired. But options can come from anywhere: from combat arms, from combat support, and from combat service support. Intelligence is your whole operation. The critical piece is the understanding of the whole picture, and that is what you need intelligence for.

Understand intelligence technical capabilities and limitations

The technical capabilities and limitations of satellites were largely unknown by the generals, specifically signals- and imagery-based collectors. But they were concerned with broader issues than the sensors. They were more concerned about the intelligence infrastructure and pathway from sensor to shooter, not only the duration of time it took to make that journey but also the processes involved along the way. Resolving contradictions stemming from their limited understanding of the entire intelligence system was essential to being an effective driver of intelligence.

(CG2***) I needed better knowledge of collection systems, who owns what, and who can produce results. How long will it take? For instance, if I have a scout on a hill, you get an answer immediately from the scout. But, not so otherwise. Commanders need to understand all elements beyond just the military. They need to know intelligence capabilities at all levels, how to get the information they need, what to ask for, and the timelines it takes to get it.

(CG7****) The intelligence guys, they need to know what systems there are. But a commander needs to know too: What are the capabilities? How can these be accessed? Like, can I turn off and on the GPS? Is there a covert capability available to me? What military services have these capabilities? Who do you go to in order to ask for help, or to get what you need? What is their name? What is the list of capabilities? This gets at real practical knowledge. I am talking about practical applicable things.

Feedback from others

While commanders used self-learning in order to resolve contradictions surrounding strategic intelligence, they simultaneously used feedback from those around them to strengthen their learning; they engaged others to reinforce and improve their own learning efforts. Commanders paid attention to a variety of people in their professional social network through dialogue and observation. These

individuals helped the commanders by providing feedback to them that the commanders used to gauge and improve how well they, themselves, thought critically and asked questions.

Whom the generals sought out consisted of people serving in three levels of hierarchy: commanding generals who were more senior to them in their reporting chain; the general's immediate subordinate intelligence officer in their reporting chain, typically holding the rank of a general officer (1- or 2-star) or colonel; and junior intelligence officers, well below them in their reporting chain, who were the ones analyzing intelligence data, typically having the rank of captain or major.

Learning from superiors

Commanders typically had little experience with satellite-based collection systems and national human intelligence collection prior to leading units in Iraq and Afghanistan. They eagerly paid attention to how their superiors interacted with this intelligence because their superiors had such experience, what kinds of questions they asked, and what they paid attention to. Commanders soaked up this knowledge like a sponge.

> (CG12****) I went and visited my boss, the Commander, Central Command. When I was there, I found out he had a CIA intelligence briefer. That's what I needed too. So, I asked for a senior intelligence officer to be my personal intelligence representative. CIA got me a senior analyst and who stayed with me for the duration in Iraq. This was my window into CIA and to some degree, the intelligence community. The analyst had a briefing book. We talked and it helped me see what I may not have seen elsewhere. Had it not been for this analyst, it would have not been so clear, the situation, I mean.

> (CG15***) I learned vicariously as a deputy commander. I watched how others did it. I had seen capabilities in tactical units before but not the national intelligence systems. I inherited the previous intelligence fusion center that the commander set up. His point was that intelligence is all about fusion. He said to me it was like the 'X Files' where the 'truth is out there.' If you work in isolation, you won't get the truth. If you work in cooperation, you will. He emphasized fusion and there were some successes.

Learning about intelligence from direct subordinates

The generals talked about how important it was to have a close and dynamic relationship with his or her most senior intelligence officer, whom they called the G-2 or J-2, in order to learn from them.

> (CG4****) When I first assumed my role as Combatant Commander at Central Command, I met my intelligence officer. He said to me, 'I can answer any question you have but I need to know why you are asking the particular question. You may be asking a good or bad question. There may be a better question to ask.' I'll never forget that conversation. In order for me to know what the best question to ask is, I need to stop being just a consumer of intelligence. This cannot be separate from operations. There needs to be shared responsibility, a joint responsibility.

> (CG10***) I never held the intelligence officer responsible because it was a partnership and I would be just as responsible for things we did not know. How did I get to this perspective? I just figured it out myself. Intelligence is so important; it has to be wedded at the hip with operations.

Learning from junior intelligence officers

Commanding generals talked about how important it was to pay attention to what junior intelligence officers thought and said, as they were the ones who first touched and analyzed the intelligence data, and could therefore give the most unfiltered assessment and bring to light any accuracy issues of concern.

> (CG8****) I learned as a brigade commander from a young intelligence officer; he told me something I will never forget. He said 'you either trust the intelligence guy or you get rid of him.'

> (CG15***) All my junior people understood the flow of intelligence better than my peers and me. We had to unlearn. They did not have to unlearn, so I deferred to my junior people. They were teaching me.

Mentoring to others

Commanders also built an organizational capacity to collectively improve self-learning within others in their professional network. They fostered this learning in three ways: commanders consciously and

intentionally felt that self-learning was a very important competency for those in their reporting chain; one of the most effective ways they used to model self-learning was to stimulate inquiry-based dialogue in others; and, they spent time on a one-to-one basis mentoring intelligence officers, in particular.

Fosters critical thinking in the organization

Not only did commanders realize how important critical thinking was for them, but they also were unequivocal about how important it was – given their own success in employing it – for those who worked for them.

(CG9***) I started this community of interest. This allowed me to ask questions. You have to ask the right questions, think critically. Create critical thinking; think strategically, like we are networked to do.

(CG18****) Critical thinking is the key for combat arms officers. By the time you are a major, you should know the details about intelligence and their capabilities. As you get higher up in the ranks, especially as a general, you get paid for your judgment. Bringing critical thinking into judgment is part of the job. You have to teach people how to be inquisitive, to use critical thinking, to be curious. All military disciplines need to have critical thinking. There needs to be not only an intellectual understanding of critical thinking, but more important, it then has to be operationalized.

Stimulate dialogue in the organization

Commanders used dialogue to foster critical thinking in others in their organization. They modeled an inquiry-based form of dialogue to evaluate assumptions and the validity of information presented to them.

(CG20***) Critical thinking is an absolute, fundamental competency that general officers need. You have to know how to work with people who can help you. You can be thinking critically by yourself but that is only the first step. The more important step is then to get it out to those around you. You need to have a rapport, to have a voice over, a forum that allows your voice to be part of a larger dialogue that can process your thoughts, so you have an organizational background that fosters this voice. That is what is needed.

(CG21***) The more informed the commander, the better. How to expose the commander to what is out there. It is about asking the right questions. Actually, it is more than asking the right questions. It's needing to know the right outcomes, as it pertains to intelligence. With intelligence, you get raw data and the intelligence officer will tell you 'that's what you asked for.' You have to facilitate the discussion with intelligence officers, it's about critical thinking, so decision-making can be enabled more effectively. It's also true not only for decision-making, but also for operational targeting and joint ISR (Intelligence, surveillance and reconnaissance).

Mentor intelligence officers

The generals felt it was their duty as a commander to help intelligence officers understand how they thought, what they needed, and to model critical thinking thought processes. They felt that by doing so, they would contribute to improve the overall organizational performance by helping subordinates understand their decision-making cycle and their information needs.

(CG14****) It is a shared responsibility to mentor intelligence officers. I grew intelligence officers. I once had a battalion commander tell me everyday in theater is a moving target. I knew he was not a demanding consumer. The number of people killed under his command was three times the number of another battalion commander; this other guy, on the other hand, put everything at his disposal to reduce the number of deaths and get the mission done. I believe this is the kind of evidence that shows that aggressive use of intelligence produces good results.

(CG16***) As we look at certain things, like critical thinking, we have to understand our own assumptions, and challenge those assumptions. The advantage with intelligence is that intelligence officers are challenging assumptions. I like to put things in tension with them so I can walk around the problem 360 degrees, let them see this.

Why this problem solving strategy is successful

The national security literature reviewed at the beginning of this paper uniformly agrees that individuals have the propensity to reject or distort contradictory information. How, then, do we explain the problem-solving strategies of the senior generals, who neither reject nor distort contradictory intelligence?

We can draw from individual and organizational learning theory to explain why the contradiction-based problems a general encounters with intelligence were able to be resolved. We start with critical thinking. Critical thinking is framed through the lenses of different disciplines: psychology, philosophy, and education.[45] Psychology stresses description whereas philosophy stresses a normative approach, and education stresses pedagogy. The definition I have used captures the diversity of psychological approaches. Critical thinking consists of three interdependent factors: disposition, capability, and judgment.[46] First, it is necessary to have the disposition, that is, the emotive motivation and willingness to consciously think critically. Second, one must have the capability to use cognitive skills such as the awareness and understanding of one's own thought process, reflection, reasoning, and questioning. Third, there must be a need to make a decision under conditions in which a judgment is required because the lack of clarity – due to ambiguity, uncertainty, and/or contradictory information – requires an evaluation be made. These three factors were evidenced in the generals interviewed for this study.

Critical thinking is an effective mechanism to resolve contradictions. Faced with a problem, such as a contradiction, learning theory tells us that resolving contradictions can be viewed along a spectrum. At one end of the spectrum, the individual can resolve the new information by modifying one's view of the world, thereby accommodating an understanding of the world, or, at the other end, the individual can resist changes to one's existing view of the world by assimilating the new information into the existing view.[47] When an individual is willing to accommodate new information, recent empirical evidence demonstrates the positive causal relationship between resolving contradictions and improving critical thinking.[48] When faced with contradictions, individuals change their views, but when assimilation is the behavior pattern, individuals are resistant to change. By accommodating information, a new worldview is created, and the individual learns; this is called self-learning, and it is how the generals characterized themselves. Of note, accommodation thinking is necessary for transformational leadership, a behavior that improves others' confidence and abilities.[49]

But we do not learn solely by ourselves; enhanced self-learning takes place. What actually happens is that individuals augment their own self-learning by actively seeking and welcoming feedback from others, so learning-by-oneself is a misnomer as others are socially embedded.[50] Dialogue is the primary mechanism in which learning is spread from and to others, often through a mentoring process.[51] If an individual then learns from others and helps others learn, then that learning is reproduced and fed forward to others who are socially embedded with the generals, helping others learn to better interpret data and integrate knowledge, resulting in the creation of an organizational learning cycle.[52] The generals received feedback and mentored others around them essentially modeling their self-learning behavior to others.

Figure 1 depicts the relationship between the problems encountered and the three-prong problem-solving strategy consisting of self-learning, feedback from others, and mentoring to others.

Generalizability and limitations

Generalizability

First, the small size of the study sample (21) may at first not seem representative of landpower senior generals but it actually represents a large portion of all 3- and 4-star combat arms landpower generals during the past eight years, but certainly not all. One indication of the generalizability is that at any one time, Title 10 of the United States code limits the number of active duty 4-star Army generals to seven, and, in my study, I interviewed nine recently retired 4-star generals. As an indication of the validity of this sample, the generals reported when in their careers they acquired a deep understanding of strategic intelligence, which was consistent with what earlier observers have stated.[53] Of the twenty-one 3- and 4-star generals interviewed, about 62% (13) said it was not until they had assignments at the 3- and 4-star level they deeply gained an understanding of strategic intelligence: 10 generals reported that it was at the 3-star level while another 3 said it was at the 4-star level. Of the remaining generals, 33% (7) said such an understanding was achieved when they were a 2-star, and 5% (1) said this understanding
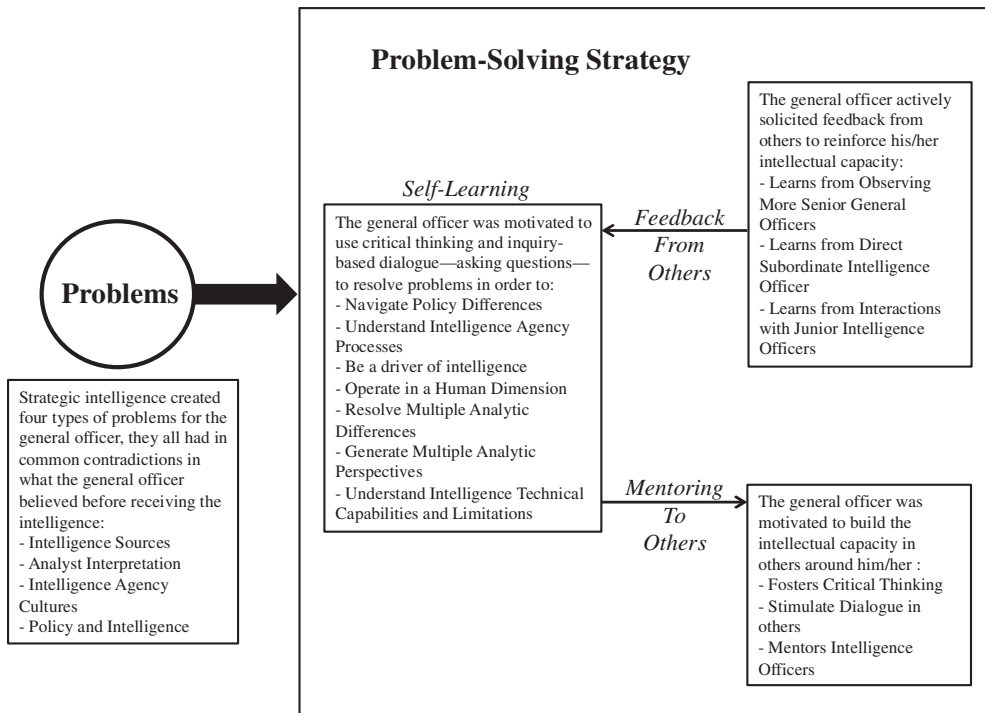
Figure 1. Socially-embedded, hierarchically-diverse, problem-solving strategy.

was achieved as a 1-star general. Given the small number of 3- and 4-star landpower combat arms generals at any one time, and the consistency of this sample with others who have reported that most general officers get exposed to strategic intelligence only in their most senior general ranks, we can make an assessment of the generalizability of this study. I suggest the three-prong problem-solving strategy is representative, and therefore, generalizable across landpower's most senior general officers.

Second, with regard to generalizability to senior civilian national security policymakers, the implications are contingent upon the experience of the policy-maker. Clearly, military officers and civilian policymakers have dramatically different roles. Military officers serve as advisers to policymakers, possessing technical expertise and operational knowledge about warfighting, whereas civilian policymakers make policy decisions, having experience in the strategic and political dimensions of policy.[54] Military officers and civilian policymakers also have different competencies. Military officers tend to be decisive, act with conviction, and advocate their position with clarity while civilian leaders tend to be inquisitive, have a tolerance to act under conditions of ambiguity, and integrate differences.[55] Yet, military officers can exhibit both sets of competencies, as this study suggests.[56] The implication of this study is that the positive benefit of contradictions triggering complex problem-solving strategies may be more generalizable to civilian national security leaders who have past experience as senior officers in the military, than those without military experience and without routine exposure to strategic intelligence.

Limitations

Two limitations are clearly merited, both revealing gaps that could be addressed in future research.

First, the study does not conclude that every senior general with command time in Iraq and Afghanistan experienced and solved problems with intelligence in the same way the 21 officers I interviewed. Because I used a snowball approach as my data collection strategy in identifying generals to interview, generals made recommendations to me for whom to interview next based on whom they

knew well and with whom they thought could contribute insight into the topic of command and intelligence. As mentioned above, some with whom I did interview mentioned other generals who avoided problems with intelligence by delegating problem resolution to their intelligence staff, but whom I did not interview.

Second, while the study identifies the motivations for the generals to use what they referred to as self-learning involving critical thinking and inquiry-based dialogue, the study does not explicitly research the actual use of critical thinking. Such a study would best be accomplished ethnographically by real-time observation.

Current approaches and a recommendation

Scholars and practitioners have offered a number of approaches to improve how general officers consume strategic intelligence, but these approaches are not based on empirically based knowledge of how generals actually consume intelligence. A few representative approaches are now discussed: two from the intelligence community and two from the military services; I pick the Army since the sample I worked with came from the landpower domain. I present these four approaches and discuss to what degree they would or would not be viable. Finally, I propose an empirically based recommendation.

Current approaches

From the intelligence community, the widely recognized purpose of intelligence is to reduce uncertainty for decision-makers.[57] One idea that is said to be helpful would be a counterintuitive approach to not reduce the uncertainty in the intelligence analysis. Uncertainty and ambiguity are inherent in intelligence, as discussed above, and a much sounder effort that would be helpful to decision-makers would be for intelligence analysts to do a better job of assessing uncertainty and bringing that picture to the surface for decision-makers to dwell upon.[58] This idea would provide increased analytic rigor but would be challenging to decision makers, especially senior policymakers, who typically demand certainty and simplicity.

Another idea from the intelligence community is that, recognizing uncertainty and ambiguity exists, intelligence analysts should embrace it and better understand the mind of decision-makers in how they process such information, tailoring their products accordingly.[59] With both approaches, the uncertainty and ambiguity inherent in intelligence would likely continue to persist, presenting problems to general officers because of their lack of experience dealing with strategic intelligence during their career. These do not directly advance how problem-solving strategies by general officers would be strengthened and rely heavily on the assumption of a successful culture change of a long-standing dilemma within the intelligence community about the interaction between analysts and policymakers.

From the Army, one idea is that general officers should be better educated about intelligence, especially the capabilities and limitations, much earlier in their career.[60] This idea has an appeal to it but it is unclear to what degree the specialized knowledge needed from intelligence officers could be absorbed by a maneuver military officer, someone not trained in the intelligence domain. Another Army idea is to focus squarely on improving critical thinking by developing this mode of thinking over the course of an officer's career through iterative and extensive formal education exposure.[61] This idea also has an appeal though it implies changing the emphasis and reward on combat tradecraft proficiency during an officer's career to one that reinforces and emphasizes critical and creative thinking early in an officer's career.[62] These two Army approaches do directly advance how problem-solving strategies would be strengthened and rely heavily on the assumption of a successful culture change within the Army.

Recommendation

I recommend a slightly different approach based on the results of this study, one that would require a change in how we think about formal education. The existing educational paradigm consists of a

program of courses during various stages of an officer's career: entrance-level officer orientation, junior officer formal education, mid-level service colleges, senior service colleges, and capstone programs for general officers. At each stage, the participants are peers having similar ranks and experiences, absent are superiors and subordinates. The existing model is an example of a lack of hierarchical diversity, of which this lack is deemed advantageous in order to offset distractions by minimizing sensitivities of rank consciousness and reducing dissimilarities in experiences. The challenge with the existing model is that it does not reflect the world of practice.

In the world of practice, such as solving complex cognitive problems, our research strongly suggests that the problem-solving task of resolving contradictions is not a one-person task; rather, it is a task requiring a multitude of people to be successful. Cognitive diversity, such as that found in the leader along with individuals from higher and lower ranks, has been empirically shown to produce better and more problem-solving solutions.[63] Given the result of our study, which reflects the value of hierarchical diversity, as well as, what we know about the contribution of cognitive diversity in improving problem solving, we need an educational experience that practices such diversity during problem solving. Otherwise, routine hierarchical diversity will likely only occur in on-the-job experiences, which may be limited to a very small percent of the officer population.

Educational experiences – both formally and informally – need to involve at least three hierarchical levels that occur simultaneously and interact with each other: the individual leader, the leaders relationship with superiors, and the leaders relationship with subordinates. Formal courses would operationalize the beneficial role – which we know from prior research and reinforced by our research – that contradiction plays in triggering hierarchical diverse problem solving. This recommendation would fill a gap in educational systems, both within the combat arms military community, as well as, across the strategic intelligence-policy-making communities.

Conclusion

In closing, I answer the question raised at the beginning of this paper, what are the problems general officers experience when they consume intelligence, and how do they resolve them? Strategic intelligence quite often appeared to senior general officers as problematic, that is, perceived by them as ambiguous, incomplete and uncertain. These perceptions triggered a variety of contradictions to what these commanders thought about the world around them. They did not dismiss or distort these contradictions. They consciously used a three-prong problem-solving strategy – using self-learning largely driven by critical thinking, listening for feedback from others, and mentoring others – to resolve their problems.

Each prong of their problem-solving strategy has been empirically and/or theoretically understood. That contradiction can lead to self-learning – via critical thinking – is not new to the psychological and management literature. Generals elicited from others around them feedback to develop and sustain their own capacity to think critically, which also, in and of itself, is not new. Finally, they then use mentoring to build the intellectual capacity in others around them, also not a new phenomenon. However, combining these methods – self-learning, feedback from others, and mentoring to others – for solving problems enhances our understanding of how cognitively demanding contexts, especially in crisis events such as wartime, can lead to socially engaged problem solving methods that simultaneously improve individual learning as well as those within their organizations.

Suggestions for improving problem solving by general officers facing intelligence (and, by implication, senior civilian national security leaders) abound. Given today's cognitive pressures from information overload and equivocality in our fast paced and complex environment, multi-faceted problem solving based on self-learning and that is socially embedded and hierarchically diverse may be an appropriate antidote, and thus be increasingly in demand. Early and continued professional education efforts structured around such problem solving has a good chance to help leaders – of all ranks – make better decisions.

Notes

1. Ferris and Handel, "Clausewitz, Intelligence, Uncertainty," 1–58; and Davies, "Intelligence and the Art of Command, 1799–1945," 589–600.
2. Intelligence refers to information that meets the stated or understood needs of policymakers and decision-makers, and has been collected, processed, and narrowed to meet those needs. See Lowenthal, *Intelligence: From Secrets to Policy*, 2. The definition of strategic intelligence is stated in Joint Chiefs of Staff, *Joint Publication 2-0*, x. Sometimes national security professionals refer to national intelligence as kinds of collection assets. The National Security Act of 1947, as amended in 2004, Section 3, redefines 'national intelligence' as 'all intelligence, regardless of the source from which derived …' Strategic intelligence and national intelligence have been used synonymously but they are different. Here, in this paper, we are focusing on strategic intelligence, regardless of the method of collection.
3. Handel, "Intelligence and Military Operations," 1–95; and Dempsey, *Joint Education*.
4. For examples, see Handel, "Intelligence and Military Operations"; Jervis, *Why Intelligence Fails*; Jensen, "Intelligence Failures,"; and Lamb, "National-level Coordination and Implementation," 219–22.
5. For a discussion of how inquiry-based dialogue helps resolve contradictions, see Argyris and Schon, *Organizational Learning*, 146; and Schon, *The Reflective Practitioner*, 246. With regard to how surprising critical thinking surfaced as a key element in resolving contradictions, I thought the generals would say their biggest concern with strategic intelligence was their lack of understanding satellite and human intelligence capabilities and limitations; yes, these were mentioned but only occasionally, and when they were, they were low on their list of concerns.
6. Festinger, *Theory of Cognitive Dissonance*, 4.
7. See a discussion about the 'fallacy of misplaced concreteness', the idea that something complex is erroneously presented as simplistic, in Whitehead, *Science and the Modern World*, 51.
8. Schumacher, *Guide for the Perplexed*, 122–6; and Rothenberg, "Janusian Process," 107–8.
9. Bazerman, *Judgment in Managerial Decision Making*, 34–5.
10. Handel, "Leaders and Intelligence," 3–39.
11. Deutsch, "Commanding Generals and the Uses of Intelligence," 194–260.
12. Davies, "Intelligence and the Art of Command, 1799–1945."
13. Jervis, "Why Intelligence and Policymakers Clash," 185–204.
14. Ibid., 194–5.
15. Leslau, "Effect of Intelligence on the Decision-making," 426–48.
16. Jervis, "Political Psychology," 481–93.
17. Walker, "Psychodynamic Processes and Framing Effects," 697–717.
18. Ibid., 715.
19. Bar-Joseph and Kruglanski, "Intelligence Failure and Need for Cognitive Closure," 75–99.
20. Gookins, "Role of Intelligence in Policy Making," 65–73.
21. Immerman, "Intelligence and Strategy," 1–23.
22. Ibid., 2.
23. Houghton, *Decision Point*, 14.
24. Fiske and Taylor, *Social Cognition*, 54.
25. Deutsch, "Commanding Generals and the Uses of Intelligence."
26. Deutsch, "Commanding Generals and the Uses of Intelligence"; and Ferris and Handel, "Clausewitz, Intelligence, Uncertainty."
27. For examples of the word 'consumption' has been used as an outcome in the national security literature: Betts, "Analysis, War, and Decision"; Hughes, "Fate of Facts in the World of Men"; Thomas, "Intelligence Production and Consumption," 125–39; Hulnick, "Intelligence Producer-consumer Relations"; Petersen, "What I Learned in 40 Years"; and Wilder, "Educated Consumer is Our Best Customer."
28. Lowenthal, *Intelligence: From Secrets to Policy*, 82.
29. For a psychological description of face-to-face interaction, see Watzlawick, Bavelas, and Jackson, *Pragmatics of Human Communication*, 50; and Goffman, "The Interaction Order."
30. Myers, *Qualitative Research in Business and Management*, 5.
31. Silverman, *Interpreting Qualitative Data*, 71.
32. Peirce, "What Pragmatism Is"; and Glaser and Strauss, *Discovery of Grounded Theory*, 1–6.
33. See these examples for how grounded theory has been applied in the intelligence literature: Prunckun, "Grounded Theory of Counterintelligence"; Zohar, "Intelligence Analysis as a Manifestation"; and Wolfberg, "Communication Patterns between the Briefer and the Policy-maker."
34. Charmaz, *Constructing Grounded Theory*, 1–12.
35. Ibid., 113–5.
36. Fischhoff, "Communicating About Analysis," 231–4.
37. In order to reduce chances of identification, a range of three years was used to indicate the time period of those general officers that were retired.
38. Biernacki and Dan Waldorf, "Snowball Sampling."

39. Charmaz, *Constructing Grounded Theory*, 46.
40. Ibid., 54.
41. *Joint Publication 2-0*, II-12.
42. For a discussion of the Army Operating Concept, see McMaster, "Continuity and Change."
43. Marrin, "Intelligence Analysis Theory."
44. Red teams are used to gain alternative perspectives about a problem set. For examples of how red team analysis is used in intelligence analysis, see Heuer and Pherson, *Structured Analytic Techniques,* 243–4; and Marrin, *Improving Intelligence Analysis*, 32.
45. Fischer and Spiker, *Critical Thinking for Army Officers*, 3.
46. Bonn, "Improving Strategic Thinking"; and Halpern, *Thought and Knowledge*, 8.
47. Piaget, *Construction of Reality in the Child*, 350–4.
48. Lehman et al., "Inducing and Tracking Confusion," 171–8.
49. Bass and Avolio, "Implications of Transactional," 241–3.
50. Alfieri et al., "Does Discovery-based Instruction Enhance Learning?"
51. Schein, "How Can Organizations Learn Faster?"
52. Giddens, *Central Problems in Social Theory*, 5; Vera and Crossan, "Strategic Leadership and Organizational Learning"; and Argote and Miron-Spektor, "Organizational Learning."
53. Handel, "Intelligence and Military Operations"; Odom, "Intelligence Analysis"; and Dempsey, *Joint Education.*
54. Ulrich, "A Primer on Civil-Military Relations," 305–314.
55. DiBella, "Military Leaders and Global Leaders."
56. Ibid.
57. Fingar, *Reducing Uncertainty*, 25.
58. Freidman and Zeckhauser, "Assessing Uncertainty in Intelligence." The United States Intelligence Community is required to describe uncertainty and ambiguity, mandated by United States Government, *Intelligence Community Directive 203: Analytic Standards*, referred to as ICD 203.
59. Odom, "Intelligence Analysis." ICD 203 requires analysts to provide products that address the needs of decision-makers.
60. Handel, "Intelligence and Military Operations"; Ferris and Handel, "Clausewitz, Intelligence, Uncertainty"; Kovacs, "Using Intelligence"; and Davies, "Intelligence and the Art of Command, 1799–1945."
61. United States Army, *Army Human Dimension Strategy 2015.*
62. Army maneuver officers spend their career perfecting their tradecraft, the technical skills germane to their warfare specialty, and perfecting their understanding of the adversary's capabilities. The system rewards them for these professional developments. To introduce a timetable to organically migrate from a technical to a strategic mindset much earlier in their career than at the colonel or general officer rank would take a cultural shift in the Army.
63. Page, *The Difference*, 9–10; and Fischhoff, "The Realities of Risk-cost-benefit Analysis."

Disclosure statement

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