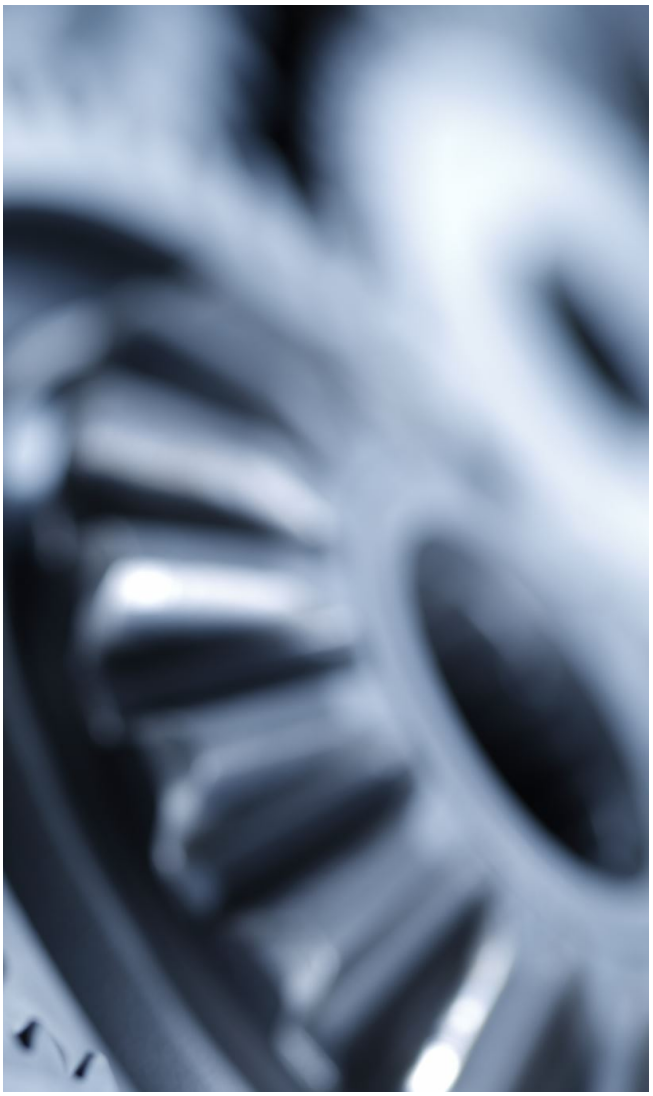
Escalation Management in 21st Century Operations in the Information Environment



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Escalation Management in 21st Century Operations in the Information Environment

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We argue that the concept of escalation thresholds remains salient in national security and may be even more important than ever. However, the Cold War model is no longer useful given the multi-dimensional and complex nature of information in today's world. We argue that escalation thresholds regarding information need to be conceived of in terms of complex systems. Qualitatively, analysts and decision makers must learn to intuit the dynamics of information in a complex world. Quantitatively, analysts must bring to bear complexity theory, and appropriate modeling and data collection. These changes have implications across the spectrum of activities that include doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy.

Executive Summary

Escalation theory developed during the Cold War in a bipolar world in which the danger that the US and Russia could escalate to nuclear war was very much feared. However, the world has changed. In contrast to the once-bipolar US-Soviet world, today's environment is multipolar and interrelated in extraordinarily complex ways, especially with regard to the role of information operations. Information threats and opportunities emerge from all echelons of state actors as well as a multitude of non-state actors. The impact of information is less controlled and can spread at light speed given the electronic interconnectivity of today's world. We argue that the concept of escalation thresholds remains salient in national security and may be even more important than ever, but it needs to be re-framed to apply to today's complex world. The key findings of this study fall into two categories.

First, escalation:

- is inherent to competition and conflict for a variety of reasons; it is often unintended and inadvertent;
- can occur by broadening a conflict to other places and populations, increasing the level of leadership involved, or politicizing its effects;
- requires unambiguous attribution for effective management; and
- is a communication process, and therefore communication theory provides a ready framework for modeling the escalation process.

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Second, compared to the Cold War Era, 21st century escalation:

- is centered on information and communication much more so;
- is far more pervasive because of the larger number of actors, from more diverse societies and echelons, all of whom wield information power;
- is more common as a result of the higher likelihood of concomitant misunderstanding
- is harder to attribute, and
- China and Russia have embraced information as a primary weapon in competition with the West.

Complexity theory provides a framework for integrating escalation and communication theory for managing escalation in the 21st century information environment (IE). Short-term measures for integration include training on basic communication theory and methods for measuring information effects, adopting a more anthropological understanding of target audiences, improving attribution technology, and tracing potential escalation pathways. Long-term measures should include integration of complexity, escalation, and communication insights across the DOTmLPF-P (doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy) spectrum.

Introduction

In this paper, we explore the extent to which escalation theory is applicable to operations in the information environment (OIE) in the context of 21st century competition, provide guidelines for how escalation can be managed in light of these principles, and recommend additional concepts and procedures required to meet 21st century challenges. This report proceeds as follows. We review the fundamentals of Cold War escalation theory and consider the characteristics that make 21st century competition unique. From there, we adapt the elements of escalation theory to consider what constitutes escalation in the context of 21st century competition and conflict. A key characteristic of 21st century competition is that it is much more complex than the Cold War era, and we propose the adoption of a complex adaptive systems thinking (CAST) approach for framing and managing escalation. The report concludes with recommendations for short-term and long-term measures the Joint Force can take to rise to the challenge of managing escalation in the 21st century IE.

Cold War Escalation Ladders

During the Cold War, fears that conflict could escalate to the point of nuclear holocaust drove theorists and strategists to consider what escalation meant and how it might be avoided (see Hanska, 2018 for a review of the key authors, concepts, and motives). Drawing on Cold War definitions, Morgan et al. (2008) define **escalation** "as an increase in the intensity or scope of conflict that crosses threshold(s) considered significant by one or more of the participants" (p. 8).

At the height of the Cold War, key figures conceptualized the parameters of the conflict, how it might escalate, and what it would take to manage escalation and ideally de-escalate tensions. Schelling (1966) alluded to escalation as "competition in risk taking, a military-diplomatic maneuver with or without military engagement but with the outcome determined more by the manipulation of risk than by an actual contest of force" (p. 166). A key to successfully preventing escalation was whether the contesting parties could coordinate their expectations of risk, often tacitly through actions and not words (Schelling, 1960, pp. 87, 262; 1966, p. 137; Smoke, 1977, p. 15). Furthermore, these early considerations of escalation realized that communication between adversaries is not solely a linguistic phenomenon; deeds as well as words communicate, and coordinating expectations required adversaries to share the meaning of what words and deeds signified.

Herman Kahn (1965) proposed a ladder of escalations that competitors might climb from peaceful negotiation to nuclear holocaust. Kahn had modest expectations of his 44-rung ladder and fully appreciated its limitations. He argued that it was not to be taken literally and was intended to generate scenarios against which decision-makers could plan for possible eventualities (Kahn, 1965, pp. 40, 216). Kahn also had an appreciation for the systemically complex and dynamic nature of escalation. He noted that even though his ladder implied a linear sequence of escalatory actions, rungs could be skipped (p. 214), and there were many pathways to climb the ladder (p. 37). Nonetheless, he argued that as a heuristic device, the ladder provided a scaffold for thinking about how escalation might take place and how to walk it back (p. 217).

Kahn (1965, p. 4) proposed three ways that escalation might take place: by increasing the intensity of conflict, widening its reach, or compounding it with new crises. Morgan, Mueller, Medeiros, Polllpeter, and Cliff (2008, p. 18) characterize these as vertical, horizontal, and political escalation. (Kahn, 1965, p. 216) also proposed a number of criteria for ordering rungs, although he also notes that each criterion could require constructing its own ladder, which was not his intention. Instead, the criteria provide measures for considering how serious an escalation might be. His criteria include:

- how close an action brings one to open war;
- how likely it is that an action can lead to an eruption of hostility;
- how provocative an escalation is;
- whether or not an action breaks a precedent;
- how committed to conflict an action makes its perpetrator appear;
- how much damage an action causes;
- how much effort it takes to carry out an action; and
- how threatening an action is perceived to be.

Scholars have debated whether or not escalation is the result of individual decisions to escalate, or whether conflict by its very nature is escalatory. (Smoke, 1977, pp. 23-29) acknowledges that calculated

escalation can happen, but he also provides six reasons why escalation is inherent to conflict and therefore particularly insidious. Smoke's conclusions have been well incorporated into recent analyses of escalation dynamics (Morgan et al., 2008, p. 160).

The first reason for escalating a conflict is that adversaries may think that by doing so they will achieve superiority and win the conflict. The second reason is that adversaries may escalate because they think they are losing and want to stop their downward trend. Third, if the stakes in a conflict are raised, then the intensity of the conflict may concomitantly be raised. One example Smoke offers is that after Great Britain realized the gravity of its situation in WWII, it escalated to terror-bombing German cities. A fourth source of escalation is when policy makers make victory a prerequisite for their domestic political success. Military necessity presents a fifth source of escalation; for instance, an actor may base assets outside of a recognized battle zone, causing an adversary to broaden the conflict to include formerly "neutral" territory, as happened with the Vietnam-era bombings of Cambodia. The sixth reason for escalation, and the one most directly relevant to OIE, is an action-reaction effect. Once conflict begins, each adversary naturally reacts to the other's actions. This creates a "cyclical-sequence escalation," in which each side raises the intensity of a conflict in reaction to the other's provocation (Smoke, 1977, p. 27). We argue that this creates a cyclical, transactional communication dynamic–a conversation.

Before Smoke, Kahn portrayed escalation as a communication dynamic, and Schelling (1966) defined it as "communication by deed " (p. 137). Kahn (1965) stressed the "great reliance on messages, symbols, demonstrations, and even 'spectacles,' as opposed to acts and objective capabilities" (p. 246). Smoke (1977) extends their characterization by stressing that escalation operates as a "cyclical sequence" between two actors, in which they feed off one another's actions and increase the severity of their escalations (pp. 27, 293). More recently, (Morgan et al., 2008, p. 31) defined suggestive escalation as escalatory moves designed to send a message and not to achieve tactical advantage on the field of battle. Smoke, Schelling, and Kahn's work converges with the leading communication theorists of their time, who had developed various transactional models of communication as a cyclical dialogue between communicators in which they create shared meaning; misinterpretations and conflict emerge when meanings are not fully shared (Barnlund, 1970; Riley & Riley, 1959; Schramm, 1954; Watzlawick et al., 1967).

A shared understanding of what words and deeds mean is crucial to understanding and managing escalation. Schelling (1960) stresses the coordination between adversaries' expectations, (Kahn, 1965, pp. 217-218) invoked the notion of understanding the adversary's national character, and (Smoke, 1977, p. 269) stressed the importance of understanding an adversary's worldview and how an action might be perceived. These themes continue to be emphasized in recent treatments of escalation (Morgan et al., 2008, p. 45; Sweijs, Usanov, & Rutten, 2016, p. 39). All of this means that analysts, strategists, and decision makers must avoid mirror-imaging (assuming that the adversary views the world and thinks like we do) at all costs (Heuer, 1999; Johnston, 2005; Shulsky, 2020) and embrace an anthropological

appreciation for what the adversary actually values and how actions will be perceived through the adversary's own cultural lens (Fenstermacher & Kuznar, 2016; Kuznar, 2011; Simons, 2014). Ethnographic methods such as participant-observation, interviews, and the analysis of discourse are well-established for understanding other's worldviews from their perspective (Bernard, 1998; Bernard & Ryan, 2010; Schiffrin, Tannen, & Hamilton, 2003). Communication theorists refer to these cultural lenses as schemas or worldviews (Bernard & Ryan, 2010; Kuznar & Yager, 2021). Worldviews are the assumptions people make about physical and social reality, how things relate, and why. One comprehensive model of worldviews groups them into general categories that include views on human nature, ability to impact the world, sources of knowledge, perspective on time, morality, relation to others, relations to groups, concepts of justice, truth, supernatural, and purpose in life (Koltko-Rivera, 2004). Failure to consider an adversary's worldview guarantees misunderstandings that will lead to unintentional and inadvertent escalations, as well as outcomes neither side wants.

Inadvertency and the Security Dilemma

Inadvertent escalation is a pervasive hazard in conflict. Adversaries may wish to engage in limited war with limited means, but conflict can escalate out of their control and undermine their interests and subvert their original goals. It is all too often easy for adversaries to wind up in conflicts that benefit no one. Morgan et al. (2008, p. 23) define inadvertent escalation as happening:

> . . . when a combatant's intentional actions are unintentionally escalatory, usually because they cross a threshold of intensity or scope in the conflict or confrontation that matters to the adversary but appears insignificant or is invisible to the party taking the action (p. 23).

Posen (1991) grounds inadvertent escalation in the concept of the security dilemma (Jervis, 1978). Security dilemmas occur when one party develops a defense against an adversary's capability, rendering that capability ineffective and thereby inadvertently threatening the adversary. The adversary consequently escalates capabilities or actions to counter the unintended threat. For instance, Great Britain saw the build-up of the German fleet before WWI as a direct threat because they assessed that a German fleet could lead to an invasion of England, whereas the English fleet could not enable a realistic invasion of Germany (Jervis, 1978, p. 170).

The inadvertencies to which we refer above involve misperceptions. However, inadvertent escalation can happen because of purely random factors as well. Random errors in judgement and chance events complicate escalation by introducing unexpected circumstances and decisions that may lead to failure or success. One such example would be the assassination of Austro-Hungarian Archduke Ferdinand by the Serbian nationalist/anarchist, Gavrilo Princip. Europe's great powers, who had arrayed themselves into two major alliances, responded with declarations of war that escalated into WWI (Antal, Krapinsky, & Redner, 2006). This points to the exceeding difficulty in predicting outcomes based on only direct (i.e.,

first order) cause-and-effect relationships; no one expected one assassination by an obscure group allied with nobody to draw them all into a global conflict.

In summary, the Cold War generated theory, concepts, analysis, and policy for managing escalation in the context of bipolar great power competition involving the potential use of large-scale conventional forces and nuclear weapons, all in the absence of 21st century information technologies. One challenge we address in this paper is whether or not these well-conceived concepts apply to 21st century great power competition that is multipolar, focused on information warfare, and playing out in the 21st century IE.

Competition and Information in the 21st Century

A first step in adapting the lessons learned from Cold War escalation theory is to establish what is different in the 21st century context that might challenge Cold War insights. We suggest there are four major differences: multipolar great power competition and the rise of regional nuclear powers; the accessibility of new technologies that can be weaponized; perhaps most importantly, the information revolution and its manifestations in the cyber world, magnified by social media; and the challenge of attribution. In addition, it is useful to consider how the Chinese and Russians have updated their information warfare concepts and their impact on competition in the 21st century.

Multipolarity

The Cold War was defined by the bipolar struggle between the US and the Soviet Union. China was a lesser party to this struggle and had a tense and unstable relationship with Russia. Since the collapse of the Soviet Union in 1989, the US has been the undisputed major world power. However, the rise of China as the world's second largest economy and Chinese diplomatic, economic, informational, and military efforts to extend its power make it the primary 21st century adversary of the US. Russia has maintained and expanded its nuclear capabilities, but its relatively small economy and post-Soviet shrinkage of its sphere of influence relegates it to being a lesser US adversary compared to China. Regional powers, notably Iran and North Korea, have extended their influence, and North Korea has developed its own nuclear capability; this gives these countries an ability to influence their regions in ways counter to US interests and, unfortunately, creates potential for dangerous escalation.

21st Century Technology

Twenty-first century warfare has been revolutionized by the emergence of new technologies such as GPS, UAVs, and information technology. Each of these have proven to be great force multipliers, allowing for increasingly accurate, remote-controlled, kinetic, and informational attacks with increased

deniability.[2] Furthermore, these new technologies are, in many cases, easily accessible and inexpensive. This has put modern weapons of war in the reach of many state and non-state actors, increasing the diffusion of physical power throughout the world's many actors and creating a more volatile environment for escalation (Hersman, 2020). All of these factors emphasize the multipolar nature of 21st century competition and conflict and add to even greater complexity in adversary relationships.

21st Century Technology and Social Media

The 21st century IE is a complex system of the Internet of Things (IOT), which include networked hardware and human/machine interfaces (Internet, mobile phones and devices, laptops, desktops, servers, data farms), combined with digital data, the exchange of information through communication processes, individual psychologies, and collective ideologies. Statisticians estimate that at least 60% of the world's population is networked in this way, creating a massive collective human/machine cyborg (Johnson, 2021). The central element of this cyborg is information, and it has emerged as the key to competition in the 21st century. Information in all its forms, from digital data and accompanying software to ideas communicated through social media, fuels military technology; it is also critical to the key resources nations, corporations, and individuals must defend, as well as the key to influencing populations and projecting power (Hersman, 2020; Wilson, 2017). Perhaps the most critical factor about this system is that it offers pervasive and easily accessible points of entry to actors regardless of organizational size or complexity.[3] Anyone linked to the IOT can wield outsize influence in the world of information access and dissemination.

Attribution

Attribution is the ability to identify the true author of an action or message. Attribution has always been a challenge when adversaries conduct covert operations or use proxies. However, attribution is an unprecedented challenge in the 21st century IE. Proxies, bots, the dark web, or the simple difficulty in identifying IP addresses make it extremely difficult to know with whom one is communicating or to attribute a message or cyber action to any particular actor (Wilson, 2017). Attribution is critical for managing escalation because the contending parties must know what the other one is signaling–they must know with whom they are communicating. If attribution is uncertain, the possibility for blaming an innocent actor is high, increasing the likelihood of inadvertent escalations. The increased use of disinformation and deep fakes will only exacerbate this problem and make escalation more likely (Hersman, 2020).

China's Information Warfare Concept

[2] See, for example, Bierbauer and Cooter (2021) for a history of the development of UAV weapons platforms.

[3] The many points of entry along many dimensions (hardware, digital, personal, ideological) can be conceived in military terms as an attack surface. The 21st century human/information interface constitutes an unprecedentedly vast attack surface.

With the People's Liberation Army publication of its "Three Warfares" doctrine in 2003, China embraced the centrality of information for national security. In this national doctrine, China acknowledged that it cannot contend in open military conflict with the US and reasoned that large-scale conventional warfare is increasingly unlikely. Therefore, it would wage "Three Warfares," each based on the control and manipulation of information (see Halper, 2013, p. 28ff.). First, "psychological warfare" involves undermining an adversary by impacting the psychology of its combatants and supporting populations. For example, China has harassed fishing boats in the South China Sea to intimidate and create fear among Vietnamese and Philippine fisherman and their governments. Second, "media warfare," or "public-opinion warfare," involves the use of domestic and international media to advance China's goals and dissuade adversarial actions. Chinese "Wolf Warrior" diplomacy and use of media to double down on positive images of China, despite criticisms such as its imprisonment of Uighurs and early failures to contain the COVID-19 pandemic, are good examples of media warfare. Finally, "legal warfare" uses international and domestic laws to advance China's influence. For instance, the Chinese have legally purchased increasingly controlling interests in US media and entertainment, giving it *de facto* veto power over negative portrayals of China (see extended example below). China's Three Warfares doctrine has been formally adopted and integrated across all levels of Chinese government and is considered the core of its military strategy (Kania, 2016).

Russia's Information Warfare Concept

The Russian tradition of manipulating information to overcome kinetic military weakness began with the Bolshevik revolution and benefited from careful cultivation, intellectual grounding, and scientific research throughout the Soviet era (Rid, 2020). This doctrine received renewed interest after disappointments in the Georgian conflict in 2008. Today, like the Chinese, the Russians begin with an admission that their conventional military capability is no match against the US, and therefore they must make information their key weapon against their perception of Western aggression (Gerasimov, 2013). This multidisciplinary perspective is known as the Primakov doctrine, after Yevgeny Primakov, the former Prime Minister of Russia.[4] This viewpoint is grounded in the political philosophies of Alexander Dugin and Igor Panarin (Thomas, 2016), taught in Russia's military and intelligence colleges, and reinforced through training and practice;[5] it is intended to create a class of Internet Warriors (Heickero, 2015). As an example, Russia explicitly embraces disinformation to sow political division and chaos (the core of Dugin's Fourth Political Theory) between Western allies and within Western societies to weaken them (Bodine-Baron, Helmus, Radin, & Treyger, 2018; Darczewska, 2014; Ellehuus, 2020; Giles, 2017; Nemr & Gangware, 2019).

[4] Some authors link this perspective to Valery Gerasimov, former Chief of Staff of the Russian armed Forces, but recent research points to Primakov. See Galeotti (2020).

[5] The Chinese and Russian approaches to incorporating information into their operations are analogous to the current US attempt to incorporate information across the DOTmLPF-P spectrum.

This brief review of 21st century competition and competitive strategies illustrates that contemporary competition is extremely complex and that China and Russia have embraced information as the primary means for contending with the West. We consider the role of information in this complex environment in the next section.

Complexity of Information in the 21st Century IE

Cold War analysts and strategists established fundamental principles of escalation that apply to any conflict: Escalation is an inherent characteristic of conflict, it is often inadvertent and unintended, and poor understanding of the adversary's worldview amplifies these trends. The failure to understand the adversary is exacerbated in 21st century competition because of the involvement of more actors from diverse cultural backgrounds with varying global and regional objectives. In addition, the centrality of information in 21st century life and national security and the complexity of the IE itself makes competing in the 21st century vastly more complex than the challenges of the Cold War (Hersman, 2020). We propose a complex adaptive systems thinking (CAST) framework for integrating concepts required to manage escalation in this unprecedentedly complex environment.

CAST involves appreciating the ***complex and highly interactive nature*** of the world (referred to "simply" as ***complexity***); the often undirected ***coevolutionary*** nature of the interrelated parts of the complex systems we encounter (where change rarely happens in a vacuum); the ***emergence*** of behaviors (challenges, and even solutions and opportunities, occur in often unpredictable and mostly uncontrolled ways where surprise frequently waits just around the corner), and the constraint of the ***adjacent possible***. We propose that CAST can serve as a framework, or meta-theory, for integrating the elements of escalation and communication theory necessary for managing escalation in the 21st century IE.

Complexity, in the mathematical sense, comes about largely through highly networked, non-linear interactions that allow for very large effects from small perturbations of the system, or conversely, dampening effects of large perturbations; furthermore, complex systems are especially sensitive to random shocks (Gleick, 1987; Holland, 1998). The highly dense, naturally rich prominence of information in 21st century competition and conflict makes the typically nonlinear communication dynamic of escalation more relevant than ever.

The late theoretical biologist Harold Morowitz noted that "all evolution is ***coevolution***" (Morowitz, 2002). This simply means that evolution and the changes it brings about do not occur in a vacuum. Evolution and change are in almost every case the result of interactions with other entities. Apart from mutation, this is how seemingly new things and ideas manifest. The almost unrestrained flow of information in the OIE fairly ensures that many escalations have the potential to spin out of control and into chaos or be swallowed up in the cacophony of voices. This can create immense challenges from the

roots of what were simple initial actions that could have been potentially defused in the beginning. Without an understanding of complex adaptive systems, we cannot anticipate how simple actions and reactions can quickly spin into complex and even chaotic conditions. That is the power of the unrestricted flow of information we experience in this current age, particularly as enhanced by the IOT with its pervasive points of entry into the infosphere.

Communication is inherently coevolutionary; it is not a simple act of a sender transmitting to a receiver, it is a conversation between communicators (Bragg, Cooley, Cooley, Kitsch, & Hinck, 2021; Schramm, 1954). The meaning of the conversation is defined by no one; it coevolves and ***emerges*** between the communicators. Moreover, no party creates or imposes the conversation's meaning, and both parties' perceptions and understandings (i.e., meanings) are changed (i.e., evolve). Furthermore, conversations do not occur in a vacuum but are part of a larger conversation of conversations, and meanings emerge from these interdependent, networked conversations (Castells, 2009). The conversational exchange between communicators in an environment of many conversations is depicted in Figure 1. Coevolution and emergence are fundamental characteristics of complex systems, and the 21st century IE is a complex system.[6] Therefore, adapting Cold War escalation theory to 21st century competition in the IE requires adoption of a CAST framework combined with modern communication theory.

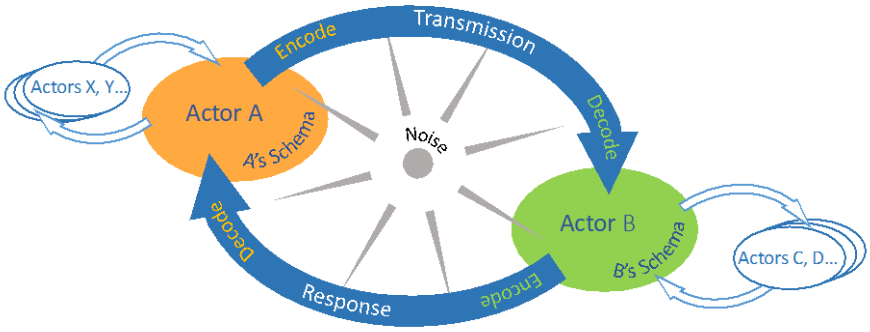

Figure 1: Transactional Model of Communication as Conversation from Bragg et al. (2021)

Several years ago, former Santa Fe Institute scientist Stuart Kauffman introduced the Theory of the Adjacent Possible (TAP) to illustrate that emergences are often constrained in complex, coevolutionary systems (Monechi, Ruiz-Serrano, Tria, & Loreto, 2017). Kauffman and his collaborators first used a system of mathematical equations to demonstrate what humankind has done to create massive innovation and concurrent eminent environmental catastrophe while expressing our creativity. Kauffman notes that TAP is the imaginative exploration of what is possible next, given what is actual

[6] We noted before the role of game theory in observing the coevolutionary nature of escalation. Game theory has been used extensively in assessing Cold War actions and intents and consistently demonstrates the back-and-forth nature of adversarial relationships that manifest in escalation behaviors at all levels. Interested readers will find detailed discussions in Axelrod and Hamilton (1981) and Poundstone (1992). Game theory texts such as these will provide richer insights and a more extensive discussion of escalation and coevolution. A subsequent paper on the present subject would include detailed discussions of the revealing topic of game theory and its variants.

now (Hunt & Hunt, 2020).[7] In other words, although complex systems provide for an incredible variety of outcomes and are therefore notoriously difficult to predict, they are not systems of "anything goes." The evolutionary pathways of complex systems are constrained by what can possibly happen next. TAP extends to conversations. What one party communicates to another is a basis for what can come next in the conversation and therefore normally constrains what form the conversation can take. A conversation in which communicators introduce unconnected signals would be disjointed and meaningless, or worse, create misunderstanding; for effective escalation management, the signals have to be adjacently possible or relevant to the conversation.

We propose using the TAP model to help describe possible outcomes and to manage escalation and de-escalation in the IE (Figure 2). Note that the system includes possibilities an actor may intend, as well as possibilities that are unintended and inadvertent. Note also that the current state of innovation, or escalation in the way we intend to use TAP, is constrained by what is likely possible, not by every possible outcome in the universe of escalation actions. We call this new application of The Adjacent Possible the TAP-ED model (denoting escalation/de-escalation).

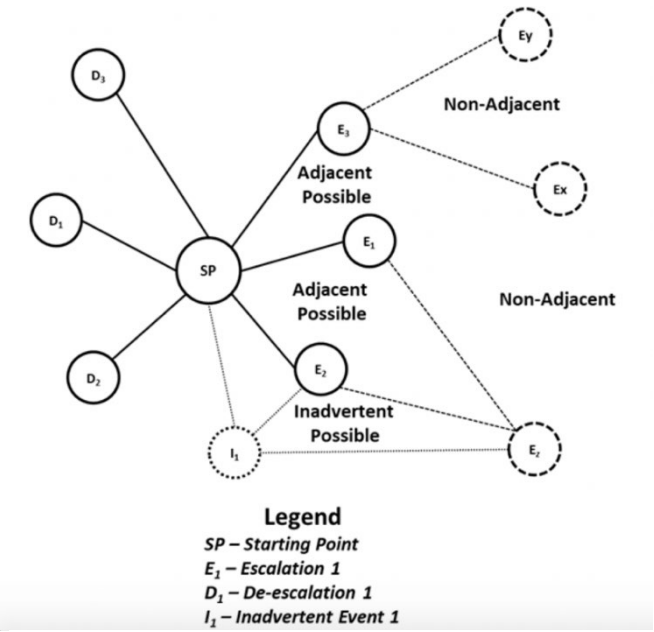

Figure 2: Theory of the Adjacent Possible (TAP) and Escalation/De-Escalation (TAP-ED)

Because of complexity, escalatory "rungs" as envisioned in previous theory are easily jumped. Coevolution empowers small information operations to amplify and produce large effects, large information operations to be dampened or outright fail, and effects to percolate throughout a system, causing unanticipated effects to emerge, perhaps years later. The TAP model allows us to visualize, perhaps even to "explain and predict," what likely next outcomes we should expect in adversary responses to our own actions. To conclude, we offer the following examples to illustrate how escalation, communication, and complexity theories are manifest in 21st century OIE escalation.

[7] See Chapter 6 in Hunt et al. (2020). While this "creative destruction" in the direst sense of the term may seem paradoxical, it is in fact not, as Kauffman explains in Chapter 6. NOTE: This use of the term "creative destruction" is far less benign than Joseph Schumpeter's introduction of the term in his 1942 work, *Capitalism, Socialism and Democracy.*.

The Complexity of Escalation and Communication in the 21st Century IE

In this section, we provide a couple real-world examples of the complexity of escalation and communication. TIhe first example illustrates how small, random actions by citizens can rapidly escalate into international controversies through social media. The example also illustrates how awareness of the IE, its autocratic institutions, and ties to media enable swift OIE. The second example is more speculative, but illustrates how seemingly cooperative actions can fester for years, potentially reinforcing a nation's commitment to information warfare. These examples demonstrate the complex nature of escalation in the IE. How the CAST approach and TAP-ED could be implemented is illustrated in Appendix: TAP-ED CONOPS for Escalation Management in the 21st Century IE.

NBA Hong Kong Protest Controversy

This first example demonstrates how obscure, random, unintended acts can easily escalate to international controversies in the 21st century IE.[8] During the summer and fall of 2019, mass protests for democracy raged in Hong Kong. Furthermore, basketball had become the most popular sport in China, broadcast by China Central TV (CCTV) and streamed online by Chinese tech giant Tencent to 640 million Chinese citizens; this represents the NBA's most lucrative market outside of the US. On October 4, 2019, Daryl Morey, the general manager of the Houston Rockets, tweeted a pro-Hong Kong demonstration meme (Figure 3), which immediately drew criticism on Chinese social media. On October 6, the Chinese Basketball Association announced that it was halting cooperation with the Houston Rockets, labeling Morey's comments "improper;" CCTV and Tencent announced that they would not broadcast or stream Rockets games; and the Chinese consulate in Houston condemned Morey's statement. The NBA reacted that same day, calling Morey's statement "regrettable."

Figure 3: Daryl Morey's pro-Hong Kong protester tweet

On October 7, Republican Senator Ted Cruz and Democrat Representative Tom Malinowski issued independent statements praising Morey and condemning the NBA; significantly, US legislators were involved in the incident to the point of condemning a private US business. CCTV declared they would stop broadcasting all NBA games, a serious blow to this major US sports industry. Beginning October 8, American basketball fans began showing up to games wearing T-shirts and bearing signs in support of the Hong Kong protests and in criticism of the NBA, threatening the NBA's primary market. On October 9, all Chinese companies cut ties with the NBA. Eventually the situation died down, and one year later,

NBA games were broadcast and streamed in China, with the exception of teams associated with Daryl Morey (Paulk & Du, 2020).

The NBA controversy demonstrates how a random act quickly jumped "rungs" and escalated into an international crisis involving embassies and legislators. It is also an example of rapid horizontal and political escalation. A tweet by a sports franchise executive upset a foreign audience (horizontal), attracted the attention of the Chinese government (vertical and political), which led to a response from US legislators (political) and created an international crisis (vertical). In reference to Kahn's eight criteria of severity, this involved practically no effort, was perceived as a threat to the adversary, and led to an equivalent level of hostility (declarations), although it did little damage to the US government and did not appear to bring the US and China closer to war. From a communication perspective, the schema of nationalistic Chinese and the Chinese government was clearly unconsidered, which lead to their feeling threatened. Likewise, the reactions of the Chinese government, CCTV, and Tencent clearly violated the schemas of US legislators and the public in terms of their values of freedom of speech. These misunderstandings exacerbated escalation. These meanings coevolved as the many parties (NBA, Chinese fans, US fans, Hong Kong protestors, the Chinese government, US officials) interacted to generate meanings that influenced behaviors, although the system eventually returned to stasis a year later.

Moscow Peace Concert

Our second example demonstrates how OIE large or small may have effects that take time to percolate through the complex IE system, having impacts in the future. Our example is necessarily historical, to allow for long-term effects, speculative and meant to illustrate how these most difficult to anticipate effects may represent strategic impacts planners and operators need to consider and monitor. Russian information warfare strategists view all Western actions, leading up to and after the collapse of the Soviet Union, as intentional attempts to use information to undermine the Soviet empire and to erode Russian values (Gerasimov, 2013; Giles & Seaboyer, 2019; Rid, 2020; Tashev, Purcell, & McLaughlin, 2019; Thomas, 2016). Many of these perceived provocations were neither planned nor executed by Western governments; they were often well-intentioned attempts to embrace a world system that was undergoing a state change[9] to a more open and democratic world. Present day Russian President Vladimir Putin was horrified at the unexpected fall of the Soviet empire and blamed Gorbachev's *Glasnost* (openness) policy for the rapid disintegration of the Soviet Union and conservative Russian

[8] This account is based on journalism from *Business Insider* (Perper, 2019), although it is easily corroborated with other sources.

[9] ***State change***, or phase transition, is a complexity concept that describes a rapid transition from one set of system relationships to a very different set of relationships (Gleick, 1987). The concept was developed to describe rapid shifts in ecological systems that emerge from perturbations to earlier systems. The rapid shift between glacial and non-glacial periods in the past 300,000 years is a classic example.

values (Pomerantsev, 2014; Putin, 1999, 2000). In early August 1989, music promoters held a heavy metal music festival, the Moscow Music Peace Festival, intended to be a Woodstock for the Soviet Union built around the themes of peace, freedom, Western-style individualism, and anti-drug use (Sanatov, 2020). It was an astounding success. The stadium filled, 120,000 tickets were sold, and musicians experienced armed soldiers dropping their weapons and profusely thanking them for bringing rock and roll to Russia. Russian youth waved American flags in adoration of these Western rock stars. Significantly, the official poster depicts an American Bald Eagle cradling the world's powers in peace (Figure 4).[10]

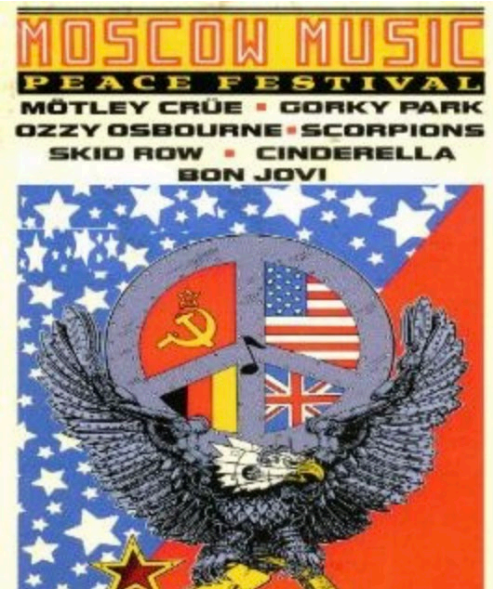

Figure 4: 1989 Moscow Music Peace Festival poster

Had this been an intentional US government information operation, it would undoubtedly have been deemed an astounding success in terms of its direct, or first-order, effects. Tangibly, a stadium was filled for a wholly unprecedented event. Musicians reported that at first the crowd did not even know how to react but then spontaneously began to dance and cheer with the music (Sanatov, 2020). The measures of effectiveness would have been off the charts. However, declaring victory was possibly premature. This event, along with so many other Western intrusions that occurred as the Soviet Union fell, could have been viewed as a symbol of how the Soviet Union was being defeated and what it needed to do to defend itself. Since gaining power in 2000, Vladimir Putin has advocated regaining a Greater Russia based on conservative values and has been a major force for making information warfare the frontispiece of Russian 21st century defense and competition.

Might a domestic, peaceful gesture have contributed to a revitalized and weaponized Russian return to Soviet active measures? What adjacently possible steps did it take from Soviet humiliation to a revitalized Russian information warfare complex? Could they have been avoided? This example demonstrates horizontal and political escalation; a music concert involving youth represented a broader social affront to conservative Soviets and was a political escalation in that the music event instantly became politicized (Sanatov, 2020). Whether or not it constituted a vertical escalation leading to the future Soviet leadership and its concept of information warfare is hard to know. In terms of Kahn's levels of severity, the event took some effort, even if it was not intended, but resulted in no immediate

[10] The American Bald Eagle (*Haliaeetus leucocephalus*), while abundant in Alaska, does not range into Siberia. It is a quintessentially American symbol.

eruption of hostility and certainly did not bring the US and Russia closer to war. However, if this event contributed to the threat conservative Soviets felt and reinforced their belief in the necessity of using information as an offensive tool, it may have been one of the many pricks that brought the Russians to their current concept of an all-out information war against the West. From the perspective of communication theory and CAST, the concert clearly was an opening of a conversation between the West and Russia in which most Russians embraced Western culture, an act which violated the schema of conservative Russians and provided Putin a constituency he could leverage for power.

Managing Escalation in the Complex 21st Century IE

The US competes against its adversaries in a mathematically complex IE in which many actors engage in conversations and create emergent meanings that have high potential for escalation in ways that are difficult to predict. However, what can be done to manage this challenge? We suggest that there are short-term measures that may blunt the possibilities for escalation. However, if the US government is going to take the threat of escalation seriously and manage it, it will have to invest in longer-term measures. We propose embedding the key insights of escalation and communication theory in the CAST framework, including TAP-ED, to suggest what short-term and long-term measures the Joint Force can undertake to manage escalation in the 21st century IE.

Short-term measures

Escalation is occurring in the IE now and must be managed, or at least channeled/dampened to support US objectives. Several key shifts in perspective and associated shifts in practice will help to manage the challenges of information escalation in a complex world. These include awareness of the pervasiveness of communication, appreciating the conversational nature of communication, understanding how an adversary understands the signals the US sends, attribution, measuring escalation, and tracking the adjacently possible pathways of escalation.

Consider all potential forms of communication. Operators and planners must embrace the fact that all actions and words communicate, whether communication is intended or not. Communication theorists sum this up by noting that "one cannot *not* communicate" (Watzlawick, Beavin, & Jackson, 1967, p. 275). Therefore, the potential that all words or deeds might provoke an adversary and escalate a tension must be considered in planning and operations, and tactics, techniques, and procedures (TTPs) must begin to reflect this realization. In the complex 21st century IE, communication acts can take place at all echelons, from unwitting tweets from service personnel or a citizen all the way to an official government statement, and all of these have the potential for creating conversations that may have a powerful

impact on escalation.[11] Operators need to be aware of how actions or words can potentially escalate a situation.

Communication is a conversation. Communication is not simply a transmission in which a sender implants a message into a receiver's brain; it is a conversation. The model of communication as a transaction between communicators, in which they reciprocate and adjust to one another's messages and jointly coevolve meaning, was introduced nearly 70 years ago and is the dominant understanding of communication among experts (Castells, 2009; Schramm, 1954). Practitioners need to frame escalation as a conversation with an adversary and monitor how that conversation evolves toward or away from escalation. Evolving shared meaning is essential in escalation/de-escalation because managing escalation requires that the meaning of a communication or action be clearly understood so that parties clearly recognize when they are intentionally being threatened and to what degree, and so that they do not mistake a signal which leads to an unintentional provocation.

Understand the adversary. Because the US competes with adversaries who hold different values, worldviews, and schemas, and who possess different offensive and defensive capabilities, it is vitally important to understand the world through their eyes; it is too easy to communicate a message as one understands it yet have one's audience come to an entirely different meaning. Misunderstanding how an adversary will understand an action or communique undermines the shared understanding required for managing escalation and avoiding inadvertent escalation. Educating and training the force to understand the worldviews of others will take time, but people with cultural expertise (foreign area officers, diplomats, personnel with prior experience in-country, academics) can be integrated into OIE in order to develop an understanding of the adversary's culture rapidly. Rapid cultural assessment should focus on answering questions regarding the values and interests target audiences have, sensitivities that we may not share, and their perceptions of threat that may lead them to escalate. The US military has successfully done this before,[12] and it can be reinstituted as a regular process.

Identify the Adversary. Because attribution is critical for managing escalation, it is imperative that the authors of signals be positively identified. Because of the anonymity afforded by the 21st century IE, attribution can be difficult to establish. However, advances in the field of informatics provide *accessible,*

[11] Two examples of this are US preacher Terry Jones's burning of the Koran, which enraged Muslims around the world by burning the Koran and resulted in riots in Afghanistan (Allen, 2011), as well as publication of the cartoons of Mohammed published by the French magazine *Charlie Hebdo*, which resulted in terrorist attacks that killed 12 people.

[12] The classic example was Ruth Benedict's development of "anthropology at a distance," during World War II, in which she interviewed expatriates, Japanese Americans, businessmen, and cultural experts to build a framework of how the Japanese viewed honor and the Emperor (Benedict, 1946). The insights from her book were influential in crafting the Japanese surrender and de-escalating the population from a war-footing to acceptance of a new peaceful order (Price, 2002).

deployable tools (e.g. Botometer at Indiana University),[13] and this is an active area of research that should continue to provide operators with relevant tools. However, an operator today must stop and consider the attribution of a signal (words or deeds) before determining whether it is escalatory or not.

Measure the state of escalation. In order to manage escalation, it is necessary to assess whether a conversation is escalating or de-escalating. Fortunately, there is a robust body of literature in discourse analysis that guides the conduct of such assessments (Fairclough, 2001; Schiffrin et al., 2003; van Dijk, 2004), which can be combined with assessment of actions to provide an operational picture of the interaction between adversaries and its escalatory or de-escalatory nature (see Kuznar, 2020 for a US/North Korea example). There are also easily accessible tools for conducting automated analysis (see Pennebaker, Boyd, Jordan, & Blackburn, 2015, and software packages such as MAXQDA and INVIVO). The Defense Advanced Research Projects Agency (DARPA) has funded research on many experimental sentiment analysis tools (PRIDE, LORELEI, COMPACT, AIDA, DCAPS, SMISC, COSMIC) that may be feasible for transition in the near future.

Track the pathways of possible escalation. Identifying when an adversary is escalating or de-escalating requires an understanding of the communication process, the adversary's worldview, and a reliable means for measuring the relative escalatory positions of the US and the adversary. However, escalation is a pathway, and the TAP-ED model provides a framework for anticipating what possible pathways escalation or de-escalation may take. Known and hypothesized adjacent possibilities (escalatory and de-escalatory) can be mapped out, providing a guide for what could happen next and either amplifying or dampening its effect (see illustration in **Appendix: TAP-ED CONOPS for Escalation Management in the 21st Century IE**). We think that the TAP-ED framework can be used in operations. However, its exploration of potential pathways essentially identifies hypothetical alternative courses of action, which may be especially useful in planning and wargaming.

Long-term Measures: Building Force Capacity

Placing information first in operations and managing competition in the IE is essential for managing escalation and is complicated and difficult. There are no simple weapons systems or tools that can be fired in order to meet the challenges. Fortunately, there is a mature, 100-year-old research base that provides the knowledge, skills, and abilities required to understand and manage escalation in 21st century competition (reviewed in Kuznar & Yager, 2021). Handling information must become as second nature as breaking down an M4 rifle or filling out a requisition form. Military leadership (especially the officer corps and non-commissioned officers) must be provided education from day one in information-related fields (communication, anthropology, informatics). What they learn must be incorporated into their daily workflows, and successful use of information must be properly incentivized and rewarded to

[13] https://botometer.osome.iu.edu

provide a pathway to career advancement for information specialists. The military has done this before; leadership understands the ways and means of transforming how the force thinks in order to achieve desired ends (Levis, 2021). Below, we briefly introduce how (ways) these long-term investments (means) can be applied to achieve placing information first in operations (ends).

Educating the Force. The future leadership of the force must receive education in escalation theory, complexity theory, applied communication, anthropology, informatics, and related disciplines. This can be effected by requiring its incorporation across the curriculum in the military academies and military and intelligence universities. This is beginning to happen piecemeal.[14] However, these initiatives must be instituted across all military and intelligence schools; the entire future leadership of the force must institute this new thinking.

Incorporation into Daily Workflows. Classwork is not enough; lessons learned will be soon forgotten unless put into practice. The requirements for and reasons why information literacy, communication theory, and complexity, and their relationship to escalation management is necessary must be established in doctrine, appropriate training must be given to the force, and leadership must be appropriately educated and incentivized. However, if information management is not incorporated into the daily operations and operational planning of the force, all of the doctrinal, training, and leadership efforts will have minimal if any effect. Therefore, the tactics, techniques, and procedures (TTPs) of the force must be adapted to putting information first in operations. By doing so, the reinforcement of learning and the advancement of the personnel with the requisite knowledge, skills, and abilities (KSAs) will be harnessed; these are the ways of applying the investments to achieve the ends the force must attain in order to manage escalation in the complex 21st century IE.

Conclusion: Implications of 21st Century Escalation in the IE on DOTmLPF-P

We have argued that in the Information Age, Cold War escalation threshold models require reconsideration in terms of complex adaptive systems thinking (CAST, as discussed above) that integrates escalation and communication theory, all of which have parallel and complimentary concepts. Qualitatively, analysts and decision makers must learn to intuit the dynamics of information in a complex world. These changes have implications across the DOTmLPF-P spectrum. In fact, the DOTmLPF-P rubric provides a useful framework for modernizing thinking about escalation. Doctrinally, the complexity of information escalation must be conceptualized and reframed in light of complex systems approaches. Organizations must adapt to accommodate the pervasiveness of informational

[14] A couple notable attempts, but not an exhaustive list, occur at the School of Advanced Air and Space Studies, and the Marine Corps University.

effects. Training and education must inculcate the concepts and skills necessary to analyze and appreciate complex information effects. Materiel will need to support intelligence, surveillance, reconnaissance, and analytical needs to deal with information in analysis, planning, and execution. Facilities must accommodate the training, education, and material needs of information, perhaps foremost in security. Leadership will need to adapt to a more dynamic consideration of the power of information and the need to coevolve in rapidly changing information environments. Appropriate personnel must be acquired or grown with modern thinking and information skills. Finally, and perhaps most importantly, information policy must align with US national values, interests, and strategic objectives.

Appendix: TAP-ED CONOPS for Escalation Management in the 21st Century IE

NOTE: This appendix describes notional leader-follower interactions related to the use of the Theory of the Adjacent Possible—Escalation/De-Escalation (TAP-ED), as initially described in the main paper. While we expand on our initial explanation of TAP-ED, the focus is primarily on discussing how TAP-ED might be leveraged in a real-world situation that could be rife with possibilities for misconstrued intent and motivation under real-world mechanics of planning and execution of the escalatory/de-escalatory process. Execution is still critical, but the premises and planning steps may differ significantly due to the insights that TAP-ED can provide. However, we suggest that execution will also be influenced in the process, as TAP-ED can serve to constantly inform the methodology in near-real-time. TAP-ED offers a window of visibility into how planning factors and richer insights might coevolve and events emerge in the context of complex adaptive systems perspectives, as noted in the main paper. Specific points that relate to IIJO lessons learned and this paper are in bold. We also make use of dialogue-driven interactions to simulate how such an event might play out between an analyst-advisor and the senior decision-maker (director) responsible for execution of an escalation/de-escalation plan.

Due to a generous yet anonymous gift, the Hong Kong Museum of History developed an exhibition entitled, *China, A Century of Humiliation*. The exhibit commemorates the period from the first Opium Wars in 1839 to the establishment of the Peoples Republic of China in 1949. The Chinese government portrays this as a lamentable period of foreign meddling in Chinese affairs that was finally defeated by the triumphant Chinese Communist Party. The USG, however, views its role in Chinese history as a shared sacrifice, especially regarding the brave actions of American volunteers such as the Flying Tigers who fought for the Chinese, as well as the pilots in the Doolittle raid that struck back at Japan after Pearl Harbor (Bishop, 2005). During this time, downed American airmen were embraced and harbored by Chinese peasants.

The United States Departments of State and Defense, in an effort to better coordinate their activities, agreed that this was an opportunity for the US to tell its story proactively. Agency leaders made the

decision to have a military attaché and retinue attend the ceremony and, with CCP permission, to honor the celebration with a cannonade from a US destroyer from international waters in the East China Sea.

A DoD JCS J2 staff intelligence officer, Major Jen Thomas, saw this as a golden opportunity to apply what she learned about effective communication in her mandatory OIE theory and escalation management classes in the Academy. Jen appreciated the complex nature of OIE and how simply directing a message as *she* understood it to an audience missed the fundamental point that communication is a multiparty, interactive conversation;[15] that understanding and appreciating the adversary's worldview is essential;[16] and that to manage escalation (including de-escalation) effectively, the parties involved have to coevolve a shared understanding that emerges[17] through that conversation. She also saw the opportunity for using the TAP-ED framework she practiced in training to game out possible courses of action (COAs) to mitigate threats and discover opportunities.

The director called Jen to stop by and discuss the joint DoS-DoD plan for the China exhibition. The initial dialogue between them went as follows:

"Got a good problem for you to apply some of that high-speed complexity stuff to, Jen," the director said. She wasn't smiling, but she did have a spark of humor in her eyes. "Think you can put some of that Academy training to use in the real-world?"

"Sure thing, ma'am. What's the problem domain, and what's the outcome we're looking for?" Jen asked the boss.

The director related the background on the initial plan to help China recognize the "*China, A Century of Humiliation"* exhibition, complete with the military entourage and cannonade. She also said that this was an initial plan that had both mid-level State Department and DoD involvement, but it hadn't been approved by either agencies' principals or the White House. The boss thought they should look at it through another set of eyes before running it up the flagpole, and that was Jen's job, as her primary ops-intel advisor. The boss told her the outcome the US would like to see involved stronger relationships at both diplomatic and military levels between China and the US, while still ensuring the rest of world understood the US played a more significant and positive role in China's modern status than the PRC would officially recognize.

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15 See IIJO Quick Look Report on Understanding Mass Self-Communication (Cooley et al., 2021).

16 See IIJO Quick Look Reports on the Transactional Communication Model (Bragg et al., 2021) and the Evolution of Communication Models (Kuznar & Yager, 2020).

17 Main body of this report.

"Okay, ma'am. That sounds like a big plan with some interesting implications, but it may be tricky to pull off both of those outcomes. I think looking at this plan and desired outcomes could definitely benefit from a complex systems mindset, given all the moving parts," Jen responded.

"Good thinking, Jen," the boss said. "What's your initial approach? Are you thinking about applying that CAST framework you told me about a few weeks ago?"

"Yes ma'am," Jen replied. "As I suspect you recall, CAST helps us focus on events, interactions, and outcomes through a lens that reflects how things work, or don't work, together, and the likely results that can come to fruition, whether intended or not. We called it coevolution and emergence. CAST doesn't provide answers, of course, just an enhanced way to think about wargaming and likely courses of action that might fit the interactions we envision. It provides an objective analytical framework that stretches us to be inclusive of the whole rather than just one side of an issue or problem domain."

Jen paused a moment and then went on. "In the Academy and Advanced Courses, we had to plan out what we called branches and sequels as follow-on activities for what certain intermediate results might provide. CAST and what you probably recall me mentioning, Theory of the Adjacent Possible for Escalation/De-Escalation, or TAP-ED, is a great setting for visualizing interactions and likely outcomes related to escalation/de-escalation activities."

"Concur, Jen. We need that kind of perspective given the sensitivities between the US and China that both we and State recognize," the boss said. "We don't think we necessarily have all the answers quite yet, but we need to make sure the focus is on improving relationships and opportunities, not just showing off, if you know what I mean."

"Yes ma'am . . . I got it. I'll spin up some CAST and the TAP-ED model and get back with you with validations and/or recommendations soonest," Jen said.

Jen's initial TAP-ED analysis indicated that using military personnel and live fire to honor the CCP while projecting a pro-American message would almost certainly lead to escalation of military activities while jeopardizing diplomatic opportunities, given Chinese sensitivities to the century of foreign domination, the fact that the US supported Chinese nationalists who were only nominally allied with the CCP during WWII, and current tensions in the East China Sea (Figure 1) (U.S. Department of State, n.d.). Even though the cannonade and increased military presence might seem relevant in a celebration of overcoming Chinese-perceived military, diplomatic, and economic domination, it could be seen both by China and the rest of the world as the US simply exercising military muscle once again. Escalating CCP military actions would likely result if the US followed this course.

Instead, a de-escalatory path could be pursued by humbly requesting the museum to invite a noted Chinese-American historian to attend the ceremony. This could open up a scholarly exchange and effectively begin a conversation in which the two sides could develop a shared understanding of historical Chinese-American relations. A shared, coevolved conversation that balanced a deemphasized (but still-mentioned) US military engagement from the years leading up to the end of WWII with the diplomatic and economic interactions of the past could be more valuable in encouraging better bilateral relationships. This course of action could create emergent opportunities for success, whereas the original plan, while well-intended, could lead to increased hurt feelings and a closing of opportunities for future diplomacy.

The director, when briefed on this analysis, balked at the scholar exchange because it carried too much risk, since the USG would have little control over academic interactions. However, the director agreed that the cannonade was over-the-top and could have been entirely ignored since it was in international waters. She sent Jen back to the modeling, while the rest of the interagency continued on their previous planning efforts.

Jen's analysis indicated that CCP officials would be offended that the USG proposed sending its warriors and not its diplomats to a scholarly event. Jen projected that the CCP would potentially respond by sending uniformed officials from the PLA who would publicly rebuff the attaché and instead recount how 250,000 Chinese civilians paid the ultimate price for helping US servicemen through Japanese reprisals for the Doolittle raid (Scott, 2015).

Jen uncovered intelligence that a senior official of the CCP Central Committee would attend the opening of the exhibition. This official was a graduate student at Berkeley in the 1980s and never forgot the day a wrong turn landed him in front of the Hell's Angels Motorcycle Club[18] national headquarters in Oakland, California. When he stopped to ask directions, a biker sporting a US military tattoo put his burly fist through the passenger window and told him to, "Get your Asian ass the f@#k out of America." This incident was known to the US intelligence community as part of the Chinese official's classified portfolio; however, the information was not conveyed to the DoS-DoD joint planning task force or to the proposed military attaché's team, nor did the attaché's team ever inquire for background on this official.

Jen also learned that prior to the event, the CCP official had ordered the External Propaganda Office,[19] which reported to him, to counter US information warfare[20] as soon as he was informed that the US

[18] This represents how unforeseen random shocks, sometimes decades old, can profoundly impact a complex system.
[19] Example of Chinese bureaucratic strength in OIE.
[20] Chinese OIE basic concept, established in doctrine and trained across its force.

was sending a military attaché to the opening. Jen rolled this tidbit into her analysis and assessed that there was no shortage of interacting parts that could produce significant surprises if unanticipated. The TAP-ED model would be more important than ever.

Two days before the event opening, like other "wolf warriors",[21] the CCP official posted his painful experience across social media platforms, which drew global attention. A new TikTok[22] account posted a dramatic three-minute portrayal of horrific abuses of Chinese peasants during WWII with a doctored image[23] of grinning onlooking American airmen who had been rescued by Chinese peasants. The video had a powerful effect on TikTok's young audience, who incidentally had never heard of the Flying Tigers or Doolittle's raid.

Figure 1. Screencap from External Propaganda Office TikTok post

The global outrage at these social media portrayals of seeming US arrogance and cowardice undermined domestic support in non-aligned states for a US-backed resolution against China's silence during the outbreak of the COVID-19 pandemic. Consequently, diplomats did not support the resolution and it failed.[24] Finally, since the US Navy destroyer required a longer lead time and had already gotten

[21] For more on "wolf warrior" diplomacy, see Brandt & Schaefer (2020).
[22] Chinese platform. SMEs expressed concern that it is used not only for propaganda purposes but also to identify Western targets for espionage.
[23] The Chinese are increasingly adopting Russian disinformation tactics (Jeangene Vilmer & Charon, 2020).
[24] Example of unintended second order effects in a complex system.

underway towards China, the Chinese Navy met the US destroyer with its newly minted carrier group in the East China Sea (Ziezulewicz, 2021).

The next day, the principals at the Departments of State and Defense, respectively, received screaming phone calls from the White House, essentially demanding to know, "What in the hell are you people doing, and who's responsible?!" Following the familiar "rolling downhill" construct, Jen's boss, the director, consequently received a similar call from her boss. The draft DoS-DoD plan to "support" the Chinese event began to fall apart, and the DepSecDef called Jen's boss into the office to figure out how the US should proceed in light of these recent events. All of a sudden, the US's planned approach no longer looked viable, and plans needed redrafting quickly.

The director called in her intelligence officer and similarly demanded to know what the hell was going on. She could not afford a setback of this magnitude at this stage in her career, and in a similarly risk-averse way, she reminded Jen she couldn't either. The commander, wanting to conduct a quick turn-around series of wargames to test alternate COAs, ordered the officer to use that "TAP-ED thing" to get them the hell out of this mess. Jen, of course, was ahead of the game and quietly replied to the boss that she had already prepared a model that was ready to brief now. She had an initial TAP-ED model that charted the principal factors she'd observed in the Chinese activities to date, balanced against adjacent possible US actions. Jen had been in on all the unfolding developments and had been working her models with the CAST framework in mind. Jen's TAP-ED model looked like the following:

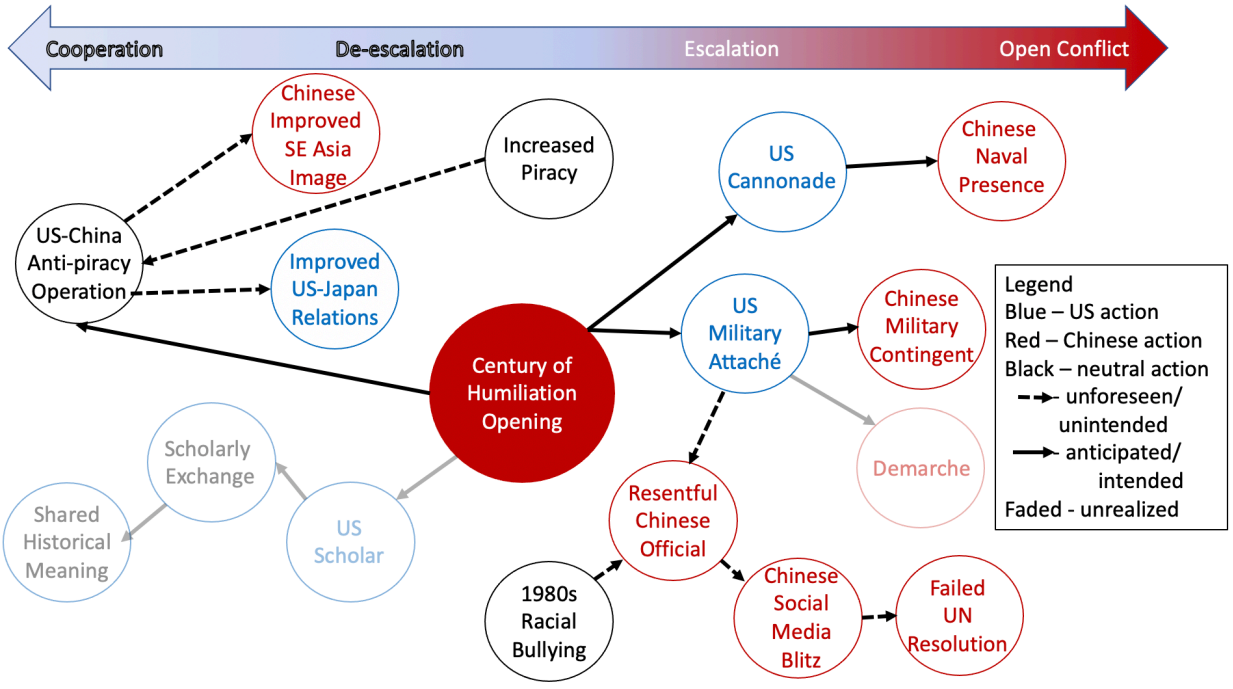

Figure 2. Jen's TAP-ED Analysis

Jen explained that her TAP-ED modeling demonstrated that having military hardware so close in the East China Sea carried the risk of mishaps and unintended escalations, such as a fly-by or ramming

accidents,[25] which could lead to actual conflict. At best, it could result in a stand-off that could last for weeks, resulting in diplomatic, monetary, and potential strategic losses by throwing off a balanced deployment of forces. She also remembered that social media threads typically have a brief (days, hours) lifespan and that engaging in a protracted rebuttal would only prolong the adversary's message.

"However," Jen pointed out, "there are adjacently possible de-escalation off-ramps. After years of decline, the pandemic has caused a spike in piracy due to increased reliance on shipping (Prins, 2021). The Straits of Malacca between Indonesia and Malaysia have been hit particularly hard. This regrettable situation offered an opportunity the US could exploit. ReCAAP (Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia) is a regional anti-piracy organization of which the US and China are members," Jen said (ReCAAP, 2021).

"How are those things adjacent possible off-ramps?" the boss asked Jen. "Remind me again how we define these things you call adjacent possible actions."

"Scientist Stuart Kauffman created the notion of the Adjacent Possible in his 2000 book, *Investigations*," Jen explained. "He initially defined it in terms of biophysics and molecular interactions, but I think you'll see what he meant as an example. Kauffman wrote 'the adjacent possible consists of all those molecular species that are not members of the actual (interaction group), but are *one reaction step away from the actual* (Kauffman, 2000).' On a technological level, this is how we eventually get space stations from Wright Brothers' airplanes, or iPhones from Alexander Graham Bell's original invention. Things build on each other . . . parts get reused in new ways, but they don't jump from Orville and Wilbur Wright's bike shop straight to the International Space Station. The progressions follow a model like TAP. We've just shown in TAP-ED that it's also possible to go backwards along similar logical paths that can result in a de-escalation as well as an escalation, as we've witnessed with the Chinese reactions to our plans even before we fully executed them. The de-escalation nodes and vectors are the off-ramps you asked about. Does that make sense, boss?"

"In other words, Jen, we could defuse the tense situation in the South China Sea if we could agree to pivot their naval power toward the Straits on an anti-piracy mission, as well as diverting our destroyer there. Second-order effects of such a mission might be a strengthening of ties with US allies such as Japan, but also an improved image of China because of its regional cooperation against the universally despised pirates," the director said. "We create win-win situations that result from what you call a coevolution of mutually developed and agreed-upon ideas and plans. We may be competitors, but TAP-ED shows us how our competition can be potentially constructive and not necessarily destructive. I

[25] For more on the ramming capabilities of Chinese warships, see Axe (2021).

don't get the thinking behind having an academic advisor, though, except for the possibility that it's a low threat situation and the advisor may be able to plant a few ideas among their Chinese peers?"

"That would be ideal, ma'am, but we have to be clear that the scholar is acting on his or her own behalf to align with the reality of our intention to be helpful. Doing so, we relinquish control, but that is a risk we have to assume in order to be credible. Meanwhile, my DoS counterpart recently offered another adjacent possible option related to combatting climate change effects in some of the islands nearby in the Asian geographic area, so that the two world leaders might appear to be cooperating across the board. Again, this is a "sciency" kind of thing that at the basic, non-political level many agree about, and we all look good in the eyes of the rest of the world cooperating on issues most countries seem to care about."

The director looked at Jen for a moment and finally nodded her agreement. "So, it seems as though in these instances, we're using TAP-ED and the de-escalation side of things to create more mutually agreeable win-wins rather than using the escalation side of the model to 'steal a march on the enemy,' as the Army says. We're not trying to one-up them but show we're willing to pull things back a notch and discover common areas for success for both players. If I got that right, then maybe TAP-ED is workable in both directions, and it provides logical progressions in either vector, depending on how negotiations might be headed. Is that about right, Jen?"

"Yes ma'am," Jen concluded. "I think as we exercise multi-directional TAP more, we'll see that it can help us better anticipate adversary actions and better chart their intentions so that we can accommodate them within our own planning. We'll be able to accommodate each other better. To make it more interesting for the long term, if the adversary is using TAP as well, we might all help avoid surprises in most situations."

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