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21st Century Deterrence

Like many 21st century phenomena, deterrence is more complex and interdependent than its 20th century equivalent. This article explores contemporary deterrence and the role of the Department of Defense (DOD) and the United States Northern Command (NORTHCOM).¹ Collaboration between academia and government spawned comprehensive nuclear deterrence literature. Deterrence theories framed the understanding of political and military elites for generations, shaping both policy and military force structure. Nonetheless, narrow focus on nuclear conflict made it inadequate for the 21st century threat environment. Absent reframing, deterrence theory is destined for the historical dustbin. To avoid becoming an anachronism, deterrence must be reframed as a holistic and continuous process across all forms of warfare.

Despite its association with war, deterrence literature does *not* explain its execution or the preparation for warfighting. Established deterrence theory addresses *bargaining* and *diplomacy*, not employment of military forces. The preeminent role of military forces is provision of *capability* necessary for deterrent effect. The military's role in *credibility* - political will - the other necessary component of deterrence, is peripheral but growing. Armed forces punish an adversary's actions or deny their ability to inflict punishment. Military practitioners must understand the deterrence process, but then exchange theoretical abstraction for real world application.

I argue 21st century deterrence is a multilevel interaction among states across hierarchical *forms* of warfare. To achieve comprehensive deterrence requires symmetrical capabilities in all forms of warfare. If war's *nature* is indeed immutable², it follows deterrence derives from a unitary conflict paradigm. Consequently, DOD must deploy capabilities to deny and punish adversary activities in all forms of warfare. In concert with its responsibilities, NORTHCOM must do likewise or coordinate and synchronize with contributing interorganizational partners. This article is in four parts. First, theoretical underpinnings of deterrence decision game models are reviewed. Second, I unpack more complex treatments of forms of warfare and time abstractions for examining real world deterrence environments. The third part applies the posited forms of warfare to contemporary Russian-American relations. The final portion considers implications for the DOD and NORTHCOM.

Theoretical Underpinnings

Like all theories, deterrence abstracts and simplifies reality. Reality is what we observe, but reality's complexity requires theory to make sense.³ The international system, politics, and warfare are complex. The multifaceted interaction of variables is difficult and frequently impossible to observe and measure in real time. Despite its abstraction from reality, theory has vital explanatory and predictive power. The problem for military practitioners is choosing the optimal theory among competing paradigms to formulate a pathway forward.

¹ For brevity, my use of NORTHCOM implies inclusion of the North American Aerospace Defense Command (NORAD).

² Martin E. Dempsey, "Joint Publication 1: Doctrine for the Armed Forces of the United States," Joint Chiefs of Staff, (2017): I-3.

³ Kenneth N. Waltz, "Evaluating Theories," *The American Political Science Review* 91, no. 4 (1997): 913.

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There is no single deterrence theory, but there are dominant ones. This article examines only *classical* and *perfect* deterrence theories in any detail. This is a necessary injustice to volumes of insightful research. Classical deterrence was chosen because of its influence among policy elites and practitioners. Perfect deterrence was chosen because it credibly critiques classical deterrence theory and proposes an alternative decision game accounting for the actual outbreak of war.

Decision theory, a derivation of game theory, is a preferred deterrence analytical method.⁴ Models use two rational agents, typically states, reacting to each other's actions. Rational actor decision game hypotheses are replicable, expose flawed logic, ambiguities, and inconsistencies, and are testable.⁵ Aside from complexity, there is no need to restrict the models to only states or only two agents. The real international environment contains considerably more interacting agents. Two agents typically suffice to illustrate concepts. Practitioners need to be cognizant of other capable, credible agents.

Assumptions and Vocabulary

Assumptions are the foundation of theory. They are not *known* to be true.⁶ If they were known to be true, they would not be assumptions. Assumptions are necessary because they cannot be verified or they simplify reality in order to proceed with predictive theory. For *classical* deterrence theorists, states are assumed to unitary agents, rational, self-interested, and utility maximizing with transitive preferences. Said differently, states act *as if* they were a single person to achieve national interests, they rank order their interests and bargain with other states to achieve the best cost-benefit outcome. Realists further assume states behave identically, while liberals allow for differentiation; for example, between democracies and autocracies. Because of its frequent misinterpretation and confusion with colloquial use, the rationality assumption requires explanation. As used here, states are *instrumentally* rational. When choosing, after calculating the likely actions of other agents, they implement the policy they believe will result in their best cost-benefit outcome. Rational does not mean reasonable, makes sense to the observer, or is in accord with the observer's preferences.⁷ Extensive literature documents the limits of human perception and the influences of culture, information, psychology, domestic institutions, and emotion on decisionmaking. While this literature is useful for discerning influences on perceptions or preferences, it is irrelevant to the rationality assumption. The rationality assumption approaches tautological. If agents behave unexpectedly, it means their preferences were miscalculated by the observer. It is not evidence of irrationality. Falsification of the rationality *assumption* is not a proper test of a theory's predictions.⁸

⁴ Daniel Ellsberg, "The Theory and Practice of Blackmail," in *RAND Corporation Paper Series* (Santa Monica 1959), 5-6; Frank C. Zagare, "Explaining the Long Peace: Why von Neumann (and Schelling) Got it Wrong," *International Studies Review* 20 (2017): 435.

⁵ Christopher H. Achen and Duncan Snidal, "Rational Deterrence Theory and Comparative Case Studies," *World Politics* 41, no. 2 (1989): 157; John A. Conybeare, "Consumption, Production, and Markets: Applications of Microeconomics to International Politics" in *Models, Numbers, and Cases: Methods for Studying International Relations*, ed. Detlef F. Sprinz and Yael Wolinsky-Nahmias (Ann Arbor: The University of Michigan Press, 2004), 310; Dan Reiter, "Exploring the Bargaining Model of War," *Perspectives on Politics* 1, no. 1 (2003): 33.

⁶ Stephen L. Quackenbush, "The Rationality of Rational Choice Theory," *International Interactions* 30, no. 2 (2004): 89.

⁷ Ellsberg, "The Theory and Practice of Blackmail," 4.

⁸ Quackenbush, "The Rationality of Rational Choice Theory," 97; Milton Friedman, *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), 13-14.

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Another frequent assumption or abstraction is war is *costly*. Arguably, this is not an assumption at all but demonstrably true. Military forces and operations are expensive, people are killed, and property destroyed. War is not chosen lightly but only after calculating costs. Practitioners must further dissect this proposition. Costliness is neither fixed nor symmetric. *Mutual* strategic nuclear exchanges cause existential damage to both states. Conventional warfare results vary. They can be symmetric or asymmetric between opponents. Irregular warfare, all else being equal, is less costly than conventional warfare. The costs of new forms of information warfare are difficult to discern, but the cost ratio benefits the aggressor. Sophistry is simpler and travels more rapidly than reason and networked systems are only as secure as their weakest entryway. In the real world, military professionals must more accurately gauge anticipated costliness totals, symmetries, and asymmetries, albeit not in isolation. Calculating social costs, particularly in democracies, requires collaboration with political decisionmakers. A costliness abstraction is too blunt for practitioners.

Credibility, *capability*, and *minimal deterrence* are common nuclear deterrence lexicon. Credibility and capability are interrelated, but not identical, concepts. Credibility is the degree to which a player is perceived to prefer to carry out its commitments and threats, as either the aggressor or defender, rather than acquiesce to an opponent.⁹ Credibility refers to political will. It is a product of other actors' perception. Credibility is an abstraction, measured as a continuum from 0 to 1 where 0 is no credibility and 1 is perfect credibility, perhaps indicative of past behavior. $Credibility = 1 - \alpha$ where α represents doubt.

Capability is the ability of a state to take action. In a noncooperative game context, it is the ability to inflict or deny punishment. An actor requires some minimal amount of capability to be credible. However, even considerable capability does not make an actor credible to use its capability because of cost-benefit calculations, past behavior, domestic considerations, or asymmetries among forms of warfare. For example, a nuclear capability may not be a credible threat in irregular war, at least for state actors. Capability is also an abstraction, measurable on a continuum from 0 to 1 where 0 is no capability and 1 is perfect capability. In military parlance, 1 reflects domain supremacy. $Capability = 1 - \beta$ where β represents deficiencies in capability. Actual capabilities are differentiated in terms of destructiveness, warfighting domains, resilience of the component parts, accuracy, effectiveness, attributability of the wielder, geographic location, and many others. Assessing and creating actual capability is the business of practitioners. What appears capable in the abstract may not be in reality. For example, the effectiveness of air and missile defenses is dependent on the ability not only to fire missiles, but to detect threats and command, control, and communicate among launcher systems.

Minimal deterrence refers to sufficient credibility and capability to inflict or deny punishment an aggressor would find unacceptable. The level of punishment need not be symmetric, just enough to upset the aggressor's preferred outcomes. Mutual Assured Destruction (MAD) is the most famous manifestation of this concept. If the Soviets and Americans both had a sufficient nuclear capability to survive a hypothetical first strike and retaliate sufficiently, then deterrence resulted. Expressed mathematically, 1 represents absolute deterrence, 0 is no deterrence, and δ represents minimal deterrence. Deterrence occurs if $(1-\beta)*(1-\alpha) \geq \delta$. Minimal deterrence applies at each level of warfare, but is progressively more difficult to achieve as war

⁹ Frank C. Zagare, "Toward a Unified Theory of Interstate Conflict," *International Interactions* 33, no. 3 (2007): 310.

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descends below strategic nuclear.¹⁰ Minimal deterrence is difficult to assess with confidence, but the calculation does occur.

Decision Games

“Chicken” and “prisoner’s dilemma” decision games frequently model deterrence. Both use decision matrices. Classical deterrence theorists far preferred chicken to model decisionmaking and bargaining during the bipolar Soviet era. Chicken got its nickname because of similarity to 1950s and 1960s era movies depicting a dual of nerves between reckless teenagers and their automobiles. It replicates zero-sum competitive games between noncooperative players; a gain by one player necessarily resulted in reciprocal loss by the other.

The challenger, player B, always moved first and player A, the defender, the player attempting to achieve deterrence and maintain the status quo, responded. In each quadrant, player A’s relative utility is listed first, followed by player B’s (A, B). See figure 1. The utility numbers are arbitrary. What matters is their relative value to each other. I chose -1 in the upper left quadrant to represent player B’s dissatisfaction with the status quo and an incentive to aggress. If both players were satisfied with the status quo, nothing would happen. I chose -100, wildly disproportional to the other quadrants, to illustrate the view mutual strategic nuclear warfare is an existential threat and unwinnable.¹¹ When player B is dissatisfied, they use militarized aggression or the *threat* of aggression to change the status quo. If player A reacts by conceding, player B wins (+1 utility) and player A loses (-1 utility). If player A defends, then player B must either concede or continue their aggression. If player B concedes, player A wins. For example, player B initiated a costly conflict and achieved little. Alternatively, player B pronounced threatening ultimatums or warnings only to be exposed as bluffing, suffering damage to their diplomatic reputation while player A’s reputation for steadfastness was enhanced. If player B decides to continue their aggression and player A remains committed to defense, conflict results. Both players end up in a worse situation than they were under the status quo.

		Player B	
		Concede	Aggress
Player A	Concede	0, -1 Status Quo	-1, +1
	Defend	+1, -2	-100, -100 Conflict

Figure 1 "Chicken" Game

Chicken was and continues to be an influential, even dominant analogy. In chicken, war is never a rational outcome for either because both have a worse utility outcome than in all other quadrants. Chicken spawned aggressive bargaining strategies such as “crazy talk” or “tying hands” to convince potential opponents a player is either irrational or has no choice but to defend

¹⁰ First strike may or may not apply.

¹¹ Bernard Brodie, *Strategy in the Missile Age* (Santa Monica, CA: RAND, 1959), 166-167. Notably, Hermann Kahn, *On Thermonuclear War*, Second ed. (Princeton, NJ: Princeton University Press, 1961), 96 argued nuclear war was winnable. The proposition enjoys little support today.

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because of the audience costs of backing down.¹² To avoid the bottom right quadrant, the opponent had little choice but to concede. Alternatively, in the face of aggression player A should pursue concessionary or cooperative bargaining *ad infinitum* because war is just too costly. Chicken is compatible with *structural* deterrence theories based on balance of power.¹³ Peace results because states cannot execute a sufficiently destructive first strike. MAD predicts surviving defending state capability *could* inflict horrendous, retaliatory punishment on the aggressor. Their credibility meant they *would*.

Frank Zagare and Marc Kilgour used prisoner's dilemma in their *perfect deterrence* alternative to classical deterrence.¹⁴ They posited classical deterrence did not transcend forms of warfare, inconsistently applied the rationality assumption, and did not accord with the historical record.¹⁵ Excessive focus on nuclear war bounded classical deterrence theory's usefulness. Everything was filtered through the lens of bipolar relationships between the Soviet Union and the United States.¹⁶ Theorists explained away the salience of conventional, let alone irregular, war because it did not matter¹⁷ or it autonomously or accidentally spiraled to nuclear war.¹⁸ In chicken no state would ever rationally choose to defend over conceding because their utility would be less if they chose war. To explain away the *assumption* players were rational required war to be the result of irrationality,¹⁹ misperception, miscalculation, or accident,²⁰ or autonomous processes beyond decisionmakers' control.²¹ Although there has never been a war involving mutual exchange of nuclear weapons, clearly possession of nuclear weapons does not prevent a nuclear state from being attacked. Neither does the lack of nuclear capability necessarily lead to capitulation to a nuclear power.

To account for these anomalies and others, perfect deterrence allows for states to rationally prefer conflict over concession in some situations. It also relaxes common realist assumptions such as the lockstep behavior of states and allows for regime differentiation - for example

¹² Brodie, *Strategy in the Missile Age*, 293; Thomas C. Schelling, *Arms and Influence* (New Haven: Yale University Press, 1966); Robert Jervis, "Perceiving and Coping with Threat," in *Psychology and Deterrence*, ed. Robert Jervis, Richard Ned Lebow, and Janice Gross Stein (Baltimore: The Johns Hopkins University Press, 1985); James D. Fearon, "Domestic Political Audiences and the Escalation of International Disputes," *The American Political Science Review* 88, no. 3 (1994): 585.

¹³ John J. Mearsheimer, "Back to the Future: Instability in Europe after the Cold War," *International Security* 15, no. 1 (1990): 51; Kenneth N. Waltz, "Anarchic Orders and Balances of Power" in *Neorealism and Its Critics*, ed. Robert O. Keohane (New York: Columbia University Press, 1986), 128.

¹⁴ Frank C. Zagare and D. Marc Kilgour, *Perfect Deterrence* (New York: Cambridge University Press, 2000). *Perfect deterrence* does not imply infallible deterrence outcomes.

¹⁵ Zagare and Kilgour, *Perfect Deterrence*, 24-31; Frank C. Zagare, "Toward a Unified Theory of Interstate Conflict," *International Interactions* 33, no. 3 (2007): 307-309; Frank C. Zagare, "Reconciling Rationality with Deterrence: A Re-Examination of the Logical Foundations of Deterrence Theory," *Journal of Theoretical Politics* 16, no. 2 (2004): 134.

¹⁶ Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974), 46; Zagare and Kilgour, *Perfect Deterrence*, 6.

¹⁷ Kenneth N. Waltz, "The Emerging Structure of International Politics," *International Security* 18, no. 2 (1993): 52-53; Mearsheimer, "Back to the Future: Instability in Europe after the Cold War," 30.

¹⁸ Robert Jervis, *Perception and Misperception in International Politics*, Second ed. (Princeton, NJ: Princeton University Press, 1976); Schelling, *Arms and Influence*, 97.

¹⁹ Brodie, *Strategy in the Missile Age*, 293.

²⁰ Robert Powell, "Nuclear Deterrence and the Strategy of Limited Retaliation," *The American Political Science Review* 83, no. 2 (1989): 517.

²¹ Schelling, *Arms and Influence*, 97; Jervis, *Perception and Misperception in International Politics*.

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between democracies and autocracies.²² Prisoner's dilemma is analogous to the predicament of two burglars in custody weighing the consequences of police cooperation or not based on their assessment of the trustworthiness of their accomplice. When playing this game, player A would choose to defend rather than concede to player B's aggression because their utility payoff is better (-2 as compared to -3) although their most preferred outcome is the status quo. However, to choose to defend requires sufficient capability to do so effectively. Otherwise, player A lacks the credibility to threaten or actually defend. In this case, a rational player B would choose to aggress with a discounted fear of risk.

		Player B	
		Concede	Aggress
Player A	Concede	0, -1 Status Quo	-3, +1
	Defend	+1, -3	-2, -2 Conflict

Figure 2 Prisoner's Dilemma

From Theory to the Real World

Theories are simplified abstractions of reality. The ordered, bipolar world of American and Soviet nuclear competition faded only to be replaced by an increasingly multipolar, interconnected one. Military and diplomatic practitioners require deeper appreciation of the environment. Reformed understanding must account for additional forms of warfare and extended interactions over time.

Forms of Warfare

Recall deterrence literature largely focused on strategic nuclear warfare. Realizing the incompleteness of this approach, a smaller tradition examined conventional deterrence. Irregular warfare was either undeterrable or the lesser option to avoid the theorized escalatory connection from conventional to nuclear warfare. DOD distinguishes war's *nature* from its *form*. War's nature is immutable,²³ a function of the interplay among a trinity of the state, the army, and the people.²⁴ Forms of warfare evolve with politics, societies, and technology.²⁵ DOD recognizes only two *forms* of warfare, *traditional* and *irregular*, which may be used in isolation but most effectively in combination.²⁶ This article uses *conventional* as an essential equivalent to *traditional*. Conventional is more widely used colloquially and in conflict literature. Nuclear is not a distinct form of warfare for DOD.

²² Zagare, "Reconciling Rationality with Deterrence" 117.

²³ Dempsey, JP 1, I-3.

²⁴ Antulio J. Echevarria II, "War's Changing Character and Varying Nature: A Closer Look at Clausewitz's Trinity," *Infinity Journal* 5, no. 4 (2017): 18.

²⁵ Dempsey, JP 1, I-4.

²⁶ Dempsey, JP 1, I-4-5

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I posit DOD correctly assessed war's unchanging nature.²⁷ However, warfare is practiced, and conceived among both domestic and international elites, in more *forms* than DOD acknowledges. If decisionmakers act in accord with their perceptions, mismatch between their framework and DOD's matters. In the contemporary era, states more easily initiate, escalate, or deescalate along a hierarchy of warfare forms. States may or may not combine their chosen form of warfare with all others beneath it in the hierarchy.

Each form manifests a distinct, but not finite, decision game. Aggressors and defenders strategically interact in a multistep decision game by choosing to aggress, defend, or concede. However, they may also choose to escalate or deescalate forms of warfare to engage in a new decision game to optimize their preferred outcomes. For example, an aggressor frustrated by deterrence at a higher form may initiate aggression at a lower level in hopes of achieving their objectives, inflicting costs, or enabling higher forms of warfare. Similarly, an aggressor or defender frustrated by their opponent's actions may escalate in hopes of inducing concessions through fear and rational calculation. Bargaining may include hostile activities, threats, both simultaneously, or be sequenced such as rhetoric followed by action.

Current forms of warfare are strategic nuclear, operational with weapons of mass destruction (WMD), conventional, irregular, and "bloodless" disruption. The forms are hierarchical. See figure 3. Their distinctiveness is not absolute but rather a function of their relative destructiveness, symmetry, and evidence elites believe and act as if they were distinct.

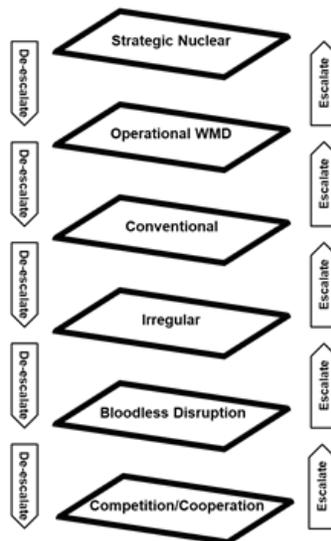


Figure 3 Levels of Warfare

To the recipient, strategic nuclear war causes widespread destruction in days or even hours. Targeting can be discriminate only in gross terms. Undoubtedly, deterrence literature conceived strategic nuclear war as distinct. So did Presidents Eisenhower and Kennedy as well as Premier Khrushchev. DOD itself dedicates a functional combatant command - United States Strategic

²⁷ Echevarria 2017 contains an excellent exposition on Clausewitz's conception of the trinity in the wake of the French Revolution and Napoleonic wars. Substantive change to elements of the trinity could alter war's nature, a proposition I accept but do not foresee in this century.

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Command - to the nuclear mission.²⁸ If the defending state has a survivable and sufficient nuclear capability and political will to use it, mutual existential destruction with the aggressor is likely.

Operational with weapons of mass destruction (WMD) is a form of warfare which also causes widespread, relatively indiscriminate damage but to a considerably lesser degree than strategic nuclear warfare. The idea of tactical nuclear warfare is not new. It was largely abandoned in literature and United States and NATO war planning as either unnecessary²⁹ or a mere interlude to escalation to strategic nuclear warfare. Operational warfare with WMD is an emerging, and disconcerting, concept interwoven with the perception of symmetries and credibility. WMD come in three configurations - chemical, biological, and nuclear. Many justifiably want keep this genie in the bottle. However, Russia, China, and North Korea have the capability to unilaterally implement operational level WMD warfare in spite of the current American viewpoint. This form of warfare is likely to be of short duration, either resulting in escalation or concessions. Symmetric tit for tat Western WMD responses lack either credibility or capability.

President Nixon renounced offensive use of biological weapons and first use of chemical weapons.³⁰ The 1972 Biological Weapons Convention banned all biological weapons use and President George H. W. Bush renounced all use of chemical weapons in 1990. These declarations precluded symmetric retaliatory use of biological or chemical WMD. As a contingency against cheating, *calculated ambiguity* is intended to deter all WMD use. Calculated ambiguity is an unspecified, flexible but devastating asymmetric response using nuclear or nonnuclear weapons.³¹

Calculated ambiguity's credibility is questionable, at least for *extended* deterrence.³² Admittedly, American implied extended deterrence applies only to unspecified "allies" and "partners".³³ Nonetheless, the United States publicly and strongly denounces any WMD use. Despite prohibitions and American policy, Iraq used chemical weapons in their 1980-1988 conventional war with Iran. They suffered little substantive response. The Soviets used chemical weapons for irregular warfare in Afghanistan.³⁴ The United States responded to the Soviets, but through third parties, not specifically tied to chemical weapon use, and in less than "devastating" fashion. Iraq and Syria used chemical weapons domestically for irregular warfare. The latter did so despite President Obama's "red line" threat "if you [Assad] make the tragic mistake of using

²⁸ <https://www.stratcom.mil/About/> Recently activated United States Space Command is assuming some space operations missions https://www.spacecom.mil/About/fbclid/IwAR1My-PgWbMcbIZXKNire_s1W7c6He--MeOagYVwutTa63thukGrCzDfUmg/

²⁹ John T. Correll, "The Neutron Bomb," *Air Force Magazine* 100, no. 12 (2017).

³⁰ Richard M. Nixon, "Executive Order 12958: Statement on Chemical and Biological Defense Policies and Programs," The White House, (1969).

³¹ James N. Mattis, "Nuclear Posture Review 2018," Department of Defense, (2018): VII-VIII; Dana Priest and Walter Pincus, "U.S. Rejects 'No First Use' Atomic Policy," *The Washington Post*, November 24 1998, A-24

³² Extended deterrence adds a third party to a two player decision game. For example, most North Atlantic Treaty Organization (NATO) allies do not develop independent WMD capabilities under the belief the United States would defend them.

³³ Donald J. Trump, "National Security Strategy of the United States of America," National Security Council, (2017): 30. Previous national security strategies have similar language.

³⁴ "Soviet Motivations for the Use of Chemical Weapons in Afghanistan," Central Intelligence Agency, (1983): 1-2.

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these [chemical] weapons, there will be consequences and you will be held accountable”.³⁵ Actual response was restrained.

Conventional warfare is large scale combat among or between states. In less common cases, it may occur between state and nonstate actors. For example, the American and Chinese Civil Wars featured considerable conventional warfare between the state and rebels. Usually the scale and intensity of fighting requires the resources of a state. Conventional warfare focuses on the defeat of an enemy’s armed forces, their supporting economy, or national will. Conventional warfare is overt, albeit containing covert aspects. Its duration may be short or extend across many years. Destruction may be widespread or limited and targeting relatively discriminate or indiscriminate. Examples include World War I, World War II, the 1967 Arab-Israeli War, and multiple others.

Irregular warfare is violent conflict among state and nonstate actors or among nonstate actors featuring low intensity, unpredictable, and fleeting engagements. Irregular warfare is asymmetric. The state typically has more power but the nonstate actor enjoys advantages in mobility and concealment. There is also economic asymmetry. It costs considerably more to suppress irregular warfare than wage it. Economic asymmetry makes irregular warfare attractive to third parties. Third parties may support proxy nonstate actors to inflict disadvantageous cost ratios on adversary states.

Bloodless disruption is contemporary information warfare between state actors. *Bloodless* refers to the use of technologies rarely causing *direct* harm to humans. However, any indirect physical harm would be viewed as a bonus. The intent is to impose persistent and cumulative economic or social costs on a defending state while obfuscating the extent of involvement of the aggressing state. Ambiguous attribution and cause and effect relationships impede counteracting the damage or the justification for escalation to higher forms of warfare.

Is bloodless conflict actually warfare? The hostile use of economics and information between states is not new. Modern cyber and other communication technologies enable substantive economic and social fabric damage at a scale eclipsing previous era possibility.³⁶ As recently as the 1990s, Russian disinformation was limited to planted newspaper stories, radio broadcasts, sympathetic magazines, and outlier political organizations. These methods required active effort from the audience to receive the message. Today’s information operations are omnipresent, more difficult to discern sources, rapidly disseminated by communication technology, and spread by legions of unknowing or uncaring citizens.

Survey data reflects measurable declines in support for government, willingness to compromise, and institutional and interpersonal trust.³⁷ Bloodless disruption can be used to more immediate, short term effect. For example, the 2010 Stuxnet cyber attack destroyed 20% of Iran’s centrifuges.³⁸ It can disrupt political will as a prelude to initiating a higher form of

³⁵ <https://www.cnn.com/2012/12/03/world/meast/syria-civil-war/index.html>

³⁶ Buddhika B. Jayamaha and Jahara Matisek, "Social Media Warriors: Leveraging a New Battlespace," *Parameters* 48, no. 4 (2018): 19-20; Linda Robinson et al., "Modern Political Warfare: Current Practices and Possible Responses," (Santa Monica, CA: RAND, 2018), 65-66.

³⁷ Lee Rainie, Scott Keeter, and Andrew Perrin, "Trust and Distrust in America," (Washington D.C.: Pew Research Center, 2019), 4-8.

³⁸ Michael B. Kelley, "The Stuxnet Attack On Iran's Nuclear Plant Was 'Far More Dangerous' Than Previously Thought," *Business Insider* (2013).

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warfare. For example, Russian bloodless disruption activities minimized resistance to their partition of Georgia and the Ukraine and the establishment of puppet republics.³⁹

Figure 3's competition/cooperation level is not a form of warfare. Cooperation refers peaceful relations among states in a positive sum decision game. For example, voluntary trade relations or the exchange of scientific information benefits both players. Competition allows for maneuvering for relative gains among competitors but within the rules of accepted international regimes. Competition/cooperation is included solely to illustrate a comprehensive model. It is otherwise beyond the scope of this paper.

Interaction across Time

Nuclear weapons dramatically shortened the amount of time necessary for widespread devastation. Even modest nuclear arsenals can inflict more destruction in a single day than was accomplished over years in World Wars I and II. Nuclear deterrence literature reflected this with single stage decision games. There was simply no need to account for time once embarked in nuclear warfare. It was assumed to lead to near instant collapse. Time is less compressed in other forms of warfare. In general, time effects lengthen in inverse relationship to the warfare hierarchy. All else being equal, conventional warfare's daily cost rate exceeds irregular warfare's but is less than if WMD are added to the mix.

In critiques of the anarchy description of the international environment, realism, and noncooperative decision games, theorists observed a "shadow of the future" or continuing relations among states shaped processes and cost-benefit analysis.⁴⁰ In other words, interstate bargaining continues, even during war. This calls into question perceptions diplomacy and military action are separate and distinct activities.⁴¹ Theorists used step models to more accurately model time effects for conventional warfare bargaining.⁴² In step models, players have multiple moves. The decision game plays out over time. This approach models a deterrence process not limited solely to strategic nuclear warfare. While academic literature rarely uses examples with more than 2-3 iterations of bargaining, practitioners must account for the more complex reality of repeated, long term interaction in the development of comprehensive deterrence strategies.

The expansion of time and forms of warfare allows modeling of agents conducting simultaneous or sequential decision games. For example, an aggressor state may be deterred and accept the status quo based on their rational assessment of costs and benefits of strategic nuclear warfare. At this level, the agents act as if they are participating in the chicken game. However, the aggressor may perceive long term opportunity to achieve their preferences by sponsoring

³⁹ Richard E. Berkebile, "New Generation Warfare and the Just War Tradition," *Interagency Journal* 9, no. 3 (2018): 21-22.

⁴⁰ Robert Axelrod and Robert O. Keohane, "Achieving Cooperation Under Anarchy: Strategies and Institutions," *World Politics* 38, no. 1 (1985): 232.

⁴¹ Richard E. Berkebile, "Reframing Strategy: Framing, Unity of Effort, and Operational Outcomes," in *Through the Joint, Interagency, and Multinational Lens: Linking the Strategic Environment and Operational Planning Volume 2*, ed. David A. Anderson and Heather R. Karambelas (Fort Leavenworth, KS: Army University Press, 2017), 33-34.

⁴² e.g. D. Marc Kilgour and Frank C. Zagare, "Explaining Limited Conflicts," *Conflict Management and Peace Science* 24, no. 1 (2007): 67-68.

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irregular warfare. In this form of warfare, the aggressor perceives a prisoner's dilemma game with a favorable cost ratio for aggression.

The Russian-American Case

Recent Russian-American relations illustrate multistep bargaining and deterrence across warfare forms. Deterrence holds at some levels while failing at others. Maneuvering is constant. For context, recall the bipolar Soviet-United States, noncooperative competition of the Cold War. The collapse of the Soviet Union ushered in a period of optimism President George H. W. Bush described as a "New World Order". Russia and the West enjoyed a short period of relative cooperation between 1991 and the end of the Boris Yeltsin's presidency in 1999. Competition and hostility replaced cooperation with the rise of Yeltsin's successor, Vladimir Putin. Toward the end of Yeltsin's administration, Russian elites perceived NATO's 1998-1999 eastward expansion as openly hostile and a breach of tacit agreement not to threaten Russian security.⁴³ Episodic cooperation still occurs between the Russians and Americans, but the relationship is generally hostile, noncooperative, and marked by mutual suspicion.

At the strategic nuclear level, the relationship resembles the familiar Cold War chicken game. The New START Treaty remains in effect, but the United States is mulling withdrawal from the Open Skies Treaty in September, 2020 over dissatisfaction with Russian compliance.⁴⁴ The United States also suspects Russia of violations of the 1996 Comprehensive Test Ban Treaty.⁴⁵ New Russian systems include intercontinental hypersonic glide vehicles and an intercontinental, autonomous Status-6 nuclear torpedo "doomsday" device.⁴⁶ Hypersonic vehicles are likely to survive current anti-ballistic missile (ABM) defenses. The Status-6 creates a massive, irradiated tsunami and, as an undersea weapon, is immune to ABM defenses. Russia apparently does not believe American ABM systems cannot be or are not designed to be effective against their strategic nuclear capabilities. While the rhetoric is tense, no strategic nuclear warfare occurs.

Operational WMD warfare also exhibits chicken game characteristics. Dissatisfied with Russian compliance with the Intermediate Range Nuclear Forces Treaty, the United States withdrew in 2019. The United States believes Russia deployed a new nuclear capable SSC-8 ground-launched cruise missile in violation of the treaty. Russia denied treaty breaches and in turn accused United States of violations through its European deployment of ABM systems which could *offensively* fire cruise missiles and development of cruise missile equivalent drones.⁴⁷ An escalate to deescalate strategy may appeal to Moscow because of conventional warfare disadvantages. In Russian *new type* or *new generation* warfare, an aggressor quickly

⁴³ Raymond J. Mas, "NATO's Expansion: A Russian Perspective," *Insight Turkey*, no. 12 (1998): 114.

⁴⁴ Kingston Reif and Shannon Bugos, "Potential U.S. Open Skies Withdrawal Announcement Coming Soon," (Washington D.C.: Arms Control Association, 2020).

⁴⁵ Reif and Bugos, "Potential U.S. Open Skies Withdrawal Announcement Coming Soon."

⁴⁶ Mattis, Nuclear Posture Review 2018, 9.

⁴⁷ Daryl Kimball and Kingston Reif, "The Intermediate-Range Nuclear Forces (INF) Treaty at a Glance," (Washington D.C.: Arms Control Association, 2019).

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overwhelms a weaker opponent by seizing territory or initiating regime change.⁴⁸ Potential extended deterrence guarantors are then faced with a *fait accompli* requiring costly actions to reverse. In case a third party actually engaged conventional warfare to restore the status quo *ante*, limited use of tactical nuclear weapons could halt the intervention due to fear of uncontrollable escalation.

While publicly denying an escalate to deescalate strategy,⁴⁹ Russian military authorities discuss the possibility.⁵⁰ Regardless, the United States views the threat seriously and is in the process of developing new, low yield weapons as a more credible response.⁵¹ By implication, a symmetric tactical nuclear response is more credible than either an asymmetric conventional or strategic nuclear one. Similar to the strategic nuclear form, diplomatic discourse is strained but no actual combat is happening. Deterrence holds.

Russia used conventional warfare against Georgia in 2008 and Ukraine in 2014. In the decision game model, the United States conceded to the aggression. Nonetheless, there were American counteractions to make future conventional aggression more costly. After the Ukrainian dismemberment, the United States sanctioned and continues to sanction 690 individual Russians and various economic sectors.⁵² The sanctions' costs were insufficient to reverse the invasion and similar sanctions are not deterring bloodless disruption warfare. In 2015, NATO began training and logistical support to Ukrainian defense forces and in 2016 deployed rotational forces into the Baltics. In 2018, NATO added Ukraine and Georgia to their Membership Action Plan for potential new members. The timeline for ascension is unclear and alliance political will is uncertain. *If* Russia planned *additional* aggressive conventional warfare with its neighbors, it appears deterred. Still, Russia remains unsatisfied with the status quo in its near abroad and has some conventional warfare advantages due to its geographic position vis-à-vis the United States. A prisoner's dilemma continues.

Irregular warfare reflects a cooperative decision game. During the Cold War, irregular warfare carried out by nonstate proxies, mostly independent but sponsored nonetheless, was common. Soviet supported "wars of national liberation" were widespread. The AK-47 assault rifle remains the ubiquitous symbol of revolution. The United States supported irregular warfare against the Soviets or Marxist regimes in places such as Afghanistan, Nicaragua, and Angola. Irregular warfare allowed lopsided imposition of costs on the defender with few risks of

⁴⁸ Valery Gerasimov, "The Value of Science is in the Foresight: New Challenges Demand Rethinking the Forms and Methods of Carrying Out Combat Operations," *Military Review* 96, no. 1 (2016 [2013]); S. G. Chekinov and S. A. Bogdanov, "The Nature and Content of a New-Generation War," *Military Thought*, no. 4 (2013).

⁴⁹ "Moscow dismisses NATO allegations re possibility of nuclear strike on Baltic states," *The Baltic Times* (2020), https://www.baltictimes.com/moscow_dismisses_nato_allegations_re_possibility_of_nuclear_strike_on_baltic_states/.

⁵⁰ Alexei Arbatov, "Challenges of the New Nuclear Era: The Russian Perspective," in *Meeting the Challenges of the New Nuclear Age: U.S. and Russian Nuclear Concepts, Past and Present*, ed. Linton Brooks, Francis J. Gavin, and Alexei Arbatov (Cambridge, MA: American Academy of Arts & Sciences, 2018), 26; Chekinov and Bogdanov, "New-Generation War," 22.

⁵¹ James N. Mattis, "Nuclear Posture Review 2018," 30; Patrick Tucker, "HASC Chair on Mini-Nukes: 'We're Not Trying to Manage a Nuclear War'," (2019), <https://www.defenseone.com/technology/2019/06/hasc-chair-mini-nukes-were-not-trying-manage-nuclear-war/157863/>.

⁵² "U.S. Sanctions on Russia: An Overview," Congressional Research Service, (2020).

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escalation.⁵³ In the contemporary environment, Russia and the United States share common enemies among radical Islamic nonstate actors. In 2017, President Putin publicly thanked the United States for information preventing a terrorist attack in St. Petersburg and former Director of National Intelligence Clapper noted such cooperation occurs regularly.⁵⁴ Russia's international reach, both physically and ideologically, is shorter than the Soviet era. Even when the United States and Russia disagree over regimes such as in Venezuela and Syria, irregular warfare is not a featured tool for bilateral animus.

Russia uses bloodless disruption warfare on a regular basis. The situation resembles a prisoner's dilemma in which the United States acquiesces (concedes) to the aggression. The United States lacks either a credible or capable response. Russia's Internet Research Agency probed election websites in 2016 and intended to discredit the American democratic process and candidate Hillary Clinton.⁵⁵ Russian influence operations used social media technologies to broadcast strident views on both sides of controversial issues. Their internet and computer enabled espionage is effective and ongoing, even penetrating Pentagon email servers in 2015. Russian tradecraft is increasingly difficult to detect through improvements in spelling, grammar, and employment of American nationals.⁵⁶ The use of deep fake videos cannot be far off. American political activists are adopting Russian influence methods for domestic use.⁵⁷ Since 2018, the United States increased its cyber counteractions, temporarily shutting down the Internet Research Agency and attempting to install computer code in the Russian electrical grid.⁵⁸ It is unclear if the United States is implementing a tit for tat strategy or what impact these offensive operations have. Notably, known American actions do not include aggressive agitation using social or public media venues.

Implications for DOD and NORTHCOM

Substantive threats to the homeland are broader than strategic nuclear warfare. State and nonstate actors can manipulate nonnuclear weapons of mass destruction, long range conventional munitions, and information weapons to produce mass effects. The armed forces are the preeminent, but not sole, provider of capability. Other governmental agencies must participate in the creation of punishment and denial capabilities. That does not mean DOD can retreat to traditional overseas oriented thinking. Roles, missions, and processes must evolve for the 21st century.

Decision games are useful models but must expand beyond strategic nuclear deterrence. States maneuver across multiple forms of warfare to optimize interests. Perceptions of symmetry

⁵³ Frank C. Zagare and D. Marc Kilgour, "Asymmetric Deterrence," *International Studies Quarterly* 37, no. 1 (1993): 19; Robert E. Osgood and Robert W. Tucker, *Force, Order, and Justice* (Baltimore: Johns Hopkins University Press, 1967), 125.

⁵⁴ Colin P. Clarke, "Russia is Not a Viable Counterterrorism Partner for the United States," *Russia Matters* (2018), <https://www.russiamatters.org/analysis/russia-not-viable-counterterrorism-partner-united-states>. While the author lists substantive obstacles to cooperation, nonetheless counterterrorism cooperation happens.

⁵⁵ James R. Clapper, "Assessing Russian Activities and Intentions in Recent US Elections," (2017): ii.

⁵⁶ Alyza Sebenius, "How Disinformation Has Morphed for the 2020 Election," *The Washington Post*, May 14 2020.

⁵⁷ Sebenius, "How Disinformation Has Morphed for the 2020 Election."

⁵⁸ Michael B. Farrell, Tim Starks, and Gavin Bade, "Trump is rattling sabers in cyberspace — but is the U.S. ready?," *POLITICO Magazine* 2019.

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bound deterrence to a single level. Deterrence does not easily transcend from one form of warfare to another. Period effects elongate as the form of warfare descends from strategic nuclear warfare to bloodless disruption. This suggests decision games must increase the number of steps modeling the deterrence puzzle.

Deterrence secures the United States and its allies. Theory is necessary but not sufficient. Military practitioners dissect theoretical abstractions for application to a more complex reality. Creating and, in the absence of deterrence, using capability is the mission of DOD and NORTHCOM. The implications of multiple forms of warfare are threefold: modernity requires a wide spectrum of capabilities, the instrumentality of symmetry and asymmetry differ between bargaining and warfighting, and tit for tat strategies are viable alternatives in the absence of minimal deterrence.

Strategic nuclear deterrence is not sufficient to prevent unacceptable loss. Enemies exploit other forms of warfare to inflict cumulative costs. For deterrence, America requires supremacy, superiority, parity, or minimally sufficient capabilities across each domain and form of warfare. Aggregate capability does not necessarily prevent hostile activities. Overall maritime dominance means little if unusable in the treacherous Arctic environment. Missile defenses are useless if neutered by hypersonic weapons. At the lowest rung of bloodless disruption, cyber domain weapons and defenses are only half the problem. Information itself can be effectively weaponized to inflict substantive costs and, over time, catastrophic ones.

Symmetry and asymmetry refer to the equivalence or lack thereof among political objects. Recall deterrence theory is about bargaining rather than warfighting. In diplomacy, symmetrical responses are more credible than asymmetric ones. For example, retaliating to limited conventional attacks with nuclear weapons is a possible but improbable policy. Even the September 11, 2001 attacks on the United States did not elicit serious consideration of nuclear response. Likewise, threatening third party sponsors of irregular warfare lacks credibility because audiences oppose "widening" war. The United States government sends mixed signals on the separability of tactical from strategic nuclear warfare. In the final analysis, the perceptions of opponents also matter. American calculated ambiguity policies notwithstanding, asymmetric retaliation incurs audience costs. On the other hand, asymmetric warfighting is instrumentally valuable. Leveraging cross domain capabilities to exploit advantages is efficient. Practitioners must not conflate bargaining with warfare.

Minimal deterrence is the product of sufficient credibility and capability. For strategic nuclear, operational WMD, and conventional warfare, the United States achieved minimal deterrence. Achievement requires high maintenance. The same is not true of irregular and bloodless disruption warfare. Rational actors bargain to optimize their preferred interests after accounting for the actions of other players. Continuing aggression in the face of punishments, bribes, concessions, and threats is not evidence of irrationality. It is evidence of incorrect assessment of the aggressor's utility payoff compared to the costs inflicted by punishment. DOD and NORTHCOM must entertain the possibility minimal deterrence is unachievable for irregular and bloodless warfare. Certainly, the Soviets, Iraqis, and Syrians found no solution in chemical weapons. Unachievable deterrence may be explained by cost differentials favoring the aggressor. For the United States, irregular warfare is an extended deterrence problem. Volumes have already been written. Perhaps solutions run through those with the most at stake.

Bloodless disruption directly affects the United States. This suggests tit for tat strategies as viable alternatives to conceding. The risk of escalation is low given American minimal deterrent

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or greater capability in higher forms of warfare. There is much less room for bargaining concessions in the homeland. Information operations have two major aspects. The first concerns the technical platforms delivering information. Hopefully, recent United States retaliatory actions on Russia may be evidence of emerging deterrent capability. At a minimum they build credibility. The second aspect is the use of weaponized information to attack social fabric. There is little public evidence of American retaliation to foreign agitation. Voice of America and Radio Free Europe are not equivalent to Russian and Chinese activities.

Russia and China fear information. Both circumscribe internet access and sponsor national social media. Russia created a special branch of the Orthodox religion specifically to inspire and harden the armed forces. A new mega church near Moscow was to feature a mosaic with Putin, Stalin, Armed Forces Chief Gerasimov, and various officials in recognition of annexing Crimea, but was nixed as “premature”.⁵⁹ Although fanciful to a Western audience, Russia appears to actually believe nonstate actors such as the Soros Foundation created the Color Revolutions.⁶⁰

Lastly, NORTHCOM should explore new information domain defense capabilities. By law as well American tradition, NORTHCOM must be cautious of overreach into matters of free speech and propaganda. That does not preclude developing technical capabilities for matters such as election security, source attribution, or antifraud defenses. Neither does it preclude more robust public affairs activities. Traditionally, DOD is most content when it is out of the national spotlight. For NORTHCOM in particular, that option has less appeal. NORTHCOM should leverage its high levels of public trust to explain everything it does or *intends* to do, controversial and noncontroversial alike. Information vacuums give space to wild conspiracies. Internet searches for JADE HELM, weapon confiscation, nonlethal weapons, old GARDEN PLOT civil disturbance plans, and Hurricane Katrina are revealing.

⁵⁹ "Russia's New Military Mega-Church to Feature Putin, Stalin, Crimea Mosaics," *The Moscow Times*, April 24 2020; Gabrielle Tetrault-Farber, "Russia drops plans for Putin mosaic in military church," *Reuters*, May 1 2020.

⁶⁰ Robinson et al., "Modern Political Warfare: Current Practices and Possible Responses", 102; Tom Wilhelm and Boris Vainer, "Russian General Staff's Military Thought on "Color Revolutions" and the Changing Nature of War," *OE Watch* 8, no. 2 (2018): 47.