

Nuclear Proliferation in the Twenty-First Century: Realism, Rationality, or Uncertainty?

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Abstract

Whether the spread of nuclear weapons in the twenty-first century should be feared or welcomed has been the subject of considerable debate. Much of this debate presumes the explanatory and predictive power of realist international system theories (realism) and rational deterrence theory (rational deterrence). Although these bodies of thought offer some important insights about the likelihood and consequences of nuclear weapons spread, they omit important aspects of the problem both theoretically and empirically. Unlike during the Cold War, a multipolar world of regional nuclear rivalries may create an unmanageable stress test for hypotheses built on realism or rational deterrence.

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Will the spread of nuclear weapons in the twenty-first century threaten international peace and world order, or will proliferation be contained—and the risk of nuclear war controlled—with as much success as in the preceding century? The optimistic arguments, relatively more acceptant of nuclear weapons spread, have been based at least partly on realist international systems theory (realism) and rational deterrence theory (rational deterrence). Against these arguments favorable to proliferation, skeptics have contended that nuclear proliferation is more to be feared than welcomed. The proliferation pessimists base some of their stronger arguments on organizational theory as it applies to nuclear crisis management and on the technical and procedural constraints related to the operation of nuclear forces.¹

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Of course, in any academic and policy debate, there are schools within schools and nuances within subplots.² But the important fault line is that between those who are convinced that nuclear weapons spread is compatible, more or less, with international stability and those who are equally concerned that nuclear proliferation raises the risks of inadvertent war or deliberate nuclear attack. If the assumptions about realist and rational deterrence theory are not as convincing as hitherto assumed, the character of the debate between the proliferation-acceptant and the proliferation-resistant schools may need rethinking. This article considers the assumptions made about realism and rational deterrence in this debate and asks whether these assumptions are robust with regard to the issue of nuclear proliferation. Historical perspective of the Cold War and the prelude to World War I are illustrative examples.

Realist Theory and its Limits

Some theorists and policy makers predicted that the slow spread of nuclear weapons could be made compatible with international peace and stability by mixing realism and deterrence.³ The argument that the post-Cold War world may be compatible with a hitherto unknown and unacceptable degree of nuclear weapons spread rests on some basic theoretical postulates about international relations. These basic assumptions are derived from the realist or neorealist school of international political thought.⁴ We are interested in the realist-derived assumptions that are specifically related to nuclear proliferation. Realist principles have considerable explanatory power and predictive utility at a very high level of abstraction, thus their appeal to some scholars. Realism also has an inherent pessimism about some aspects of international relations, thus its road-tested user friendliness for worldly heads of state and military planners.⁵ A summary of the major tenets of some of the more important schools of modern realist political theory appears in table 1.

Proponents of international realism confronted nuclear technology with mixed reactions. The nuclear revolution separated the accomplishment of military denial from the infliction of military punishment. The meaning of this for strategists was that military victory, defined prior to the nuclear age as the ability to prevail over opposed forces in battle, now was permissible only well below the level of total war. Less than total wars were risky as never before. Nuclear realists admit that these profound changes have taken place in the relationship between force and

policy. They argue, however, that the new relationship between force and policy strengthens rather than weakens some perennial principles of international relations theory. Power is still king, but the king is now latent power in the form of risk manipulation and threat of war instead of power actually displayed on the battlefield. Peace is now guaranteed by threat of war unacceptable in its social consequences instead of being dependent upon the defender’s credible threat to defeat an attack.

Table 1. Assumptions of major realist thought

	Human-nature realism	Defensive realism	Offensive realism
Principal cause of state competition for power	Inherent lust for power on the part of states or governments, based in human nature	Structure of the international system, especially system polarity and its impact on alliance formation	Structure of the international system, especially system polarity and its impact on alliance formation
Amount of power that states want	States seek to maximize power relative to other states; regional or global hegemony is states’ ultimate goal	States emphasize preservation of the existing balance of power and favorable incremental adjustment of the status quo	States seek to maximize power relative to other states; regional or global hegemony is states’ ultimate goal

Adapted from John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: W. W. Norton, 2001), 22.

Note: Mearsheimer is not responsible for changes made by the author or for its use here.

Strong and Weak Assumptions

The nuclear version of international realism has a number of intellectual and policy-prescriptive weaknesses. Systems theorists are not always as careful as they ought to be in crossing over from the abstract and hypothetical-deductive logic of models into the prescriptive worlds of policy analysis and policy making. Simply put: some prominent thinkers are too willing to follow their models over the cliff. Also, in some widely cited versions of realist theory, formal causes are confused with efficient causes. The hypothesized intellectual system morphs into a high-wire player on the world stage instead of a descriptive or explanatory tool for thinking. This bait and switch from intellectual construct to leviathan credits systems with behavior actually attributable to actor perceptions, goals, and capabilities. Statesmen such as Bismarck, Metternich, and Kissinger are no longer writing the play but merely reading their lines.

The first problem for some realist theorists is that, in crossing from the world of abstraction to the universe of actual policy making, their assumptions introduce hidden biases. Assumptions that do no damage

in the world of models (where all assumptions are equal) can be pathologically misguided when they leak into policy-derived explanations or predictions. For example, political scientist Kenneth Waltz explicitly compared the behaviors of states in an international system to the behavior of firms in a market. As the market forces firms into a common mode of rational decision making to survive, so, too, does the international system, according to Waltz, dictate similar constraints upon the behavior of states. The analogy, however, is wrong. The international system does not dominate its leading state actors: leading states define the parameters of the system. The international system, unlike the theoretical free market, is subsystem dominant. The system or composite of interactions among units is the cross product of the separate behaviors of the units.⁶

As international relations theorists Bruce Bueno de Mesquita and David Lalman have noted, whether foreign policy decisions are conceptualized from a realist or a domestic politics perspective influences how we understand the selection of foreign policy goals and the roles of state policy makers.⁷ One distinction between the two perspectives is the assumption made by adherents of each about the role of the unitary actor. Realists assume a stronger unitary actor, making decisions on the basis of the balance of power and other strategic interests created by the state's place in the international order. From the perspective of domestic politics, on the other hand, the unitary actor assumption is weaker. As Bueno de Mesquita and Lalman explain, "Like the realist unitary actor, the domestic unitary actor is responsible for selecting the strategic actions required to implement the society's objectives to the best of his or her ability. Unlike the realist unitary actor, the domestic unitary actor is not charged with defining the aims of foreign policy. These aims originate from the domestic political process."⁸

International politics is a game of oligopoly, in which the few rule the many. Because this is so, there cannot be any system to which the leading oligopolists, unlike the remainder of the states, are subject against their wishes. The system is driven by the preferred ends and means of its leading members on issues that are perceived as vital interests to those states or as important although not necessary vital.⁹ Realists, especially structural realists who emphasize the number of powers and their polarities as determinants of peace and war, assume that some system of interactions exists independently of the states that make it up. This is a useful heuristic for theorists but a very mistaken view of the way in which policy is actually

made in international affairs. Because realists insist upon reification of the system independently of the principal actors within the system, they miss the subsystemic dominance built into the international order. Napoleon Bonaparte and Adolph Hitler, for example, saw the international order not as a system that would constrain their objectives and ambitions but as a series of swinging doors, each awaiting a fateful, aggressive push. Bueno de Mesquita and Lalman, having analyzed competing models of realpolitik and domestic interpretations for international outcomes, found that “a perspective that is attentive to the domestic origins of foreign policy demands gives a richer and empirically more reliable representation of foreign affairs than a realist emphasis.”¹⁰

Attempts by realists to circumvent some explanatory problems create other problems. As international politics specialist Robert Jervis has noted, one can divide international systems theorists according to whether the system is treated as an independent variable, as a dependent variable, or as both.¹¹ Waltz contends that the most important causes of international behavior reside in the structure of the international system, that is, in the number of powers and in their positions relative to one another.¹² Jervis notes that Waltz’s structure omits some important variables and processes that are at neither the system nor the actor level—for example, technology and the degree and kind of international interdependence.¹³ These and other previously cited criticisms of realism are less telling as complaints about its internal logic than they are about its potential for incompleteness in explaining or predicting international interactions. Ironically, Waltz’s earlier major work on this subject, *Man, the State and War*, makes a compelling argument that cogent explanations for war or its absence require all three levels of analysis: first image (the individual); second image (the nation-state and its decision making); and third image (the international system).¹⁴

Formal or Efficient Causes

A second problem in realism theories is the confusion or conflation of formal and efficient causes. System polarity is virtually identical with system structure in many realist arguments. But this near identity of polarity and structure is flawed. Polarity is more the result of past state and nonstate actor behaviors than it is the cause of future behaviors. Cold War bipolarity was the result of World War II, of the presence and distribution of nuclear weapons, and of the fact that leaders perceived

correctly the futility of starting World War III in Europe. Leaders' perceptions of the balance of power are an intervening variable between polarity and outcomes such as stability, including peace or war. In other words, leaders' perceptions, including their risk aversion or risk acceptance, are the efficient causes for international behavior; systems and polarity are formal causes.¹⁵ By analogy, the formal cause of divorces is marriage; the efficient cause, disagreement between married parties.

The difference between efficient and formal causes is important for theories that purport to be empirically testable. Formal causes are proved by an abstract process that follows a deductive chain of reasoning. Efficient causes are demonstrated by observation of temporal sequences and behavioral effects. International systems theorists who emphasize the importance of structure have been more successful at proving formal than efficient causes. There is merit in doing so, and Waltz and others who have argued from this perspective deserve credit for their rigor and for the insights derived from their perspective.¹⁶

The danger for international systems theorists lies in transferring inferences from the realm of deductive logic to the world of policy explanation and prediction. For example, Waltz argues both that: (1) because there were only two Cold War superpowers, each had to balance against the other at virtually any point, and (2) disputes among their allies could not drag the United States and Soviet Union into war because they could satisfy their deterrence requirements through internal balancing rather than alliance aggregation.¹⁷ The first argument is at least partly inconsistent with the second, and neither is confirmed by Cold War evidence. The Americans and Soviets sometimes conceded important disputes to one another in order to avoid the possibility of inadvertent war or escalation, as in the US refusal to expand the ground war in Vietnam on account of expected Soviet and Chinese reactions. And allies sometimes did drag the superpowers into crisis under credible threat of war, as the Israelis and Egyptians did in 1973.

Despite these logical problems in realist theory, it remains influential as time passes for two reasons. First, international relations and security studies are as subject to bandwagoning effects as are other fields. Prominent ideas gather new adherents in leading graduate schools, and the products of those graduate schools carry the ideas far and wide into the profession. Second, realism does have major virtues. Unlike many social science theories applied to international politics and foreign policy, it is

self-consciously aware of the importance of military history and of strategy. Political scientist John Mearsheimer's *The Tragedy of Great Power Politics* shows how the realist perspective can be used to interrogate history for pertinent lessons about policy, as do later works by fellow international affairs scholars Stephen M. Walt and Barry R. Posen.¹⁸ Because of this explicit interdependency between history and theory in realist approaches, realists emphasize the critical role played by grand strategy in a state's effort to define and resolve its security dilemmas.¹⁹

These positives about realism could outweigh its negatives in a world made up of only nonnuclear powers (before World War II) or of only two nuclear superpowers (during the Cold War). But an emerging landscape of multiple nuclear-armed state and nonstate actors changes the context within which prior arguments worked. Realism worked (conditionally) in a world of conventional deterrence, where great powers could still fight major wars at an acceptable cost. Nuclear weapons changed this calculation. One might save realism in a world of nuclear plenty by arguing that nuclear deterrence replaces conventional war fighting as the major stabilizing dynamic. But this argument cannot fast forward from a bipolar nuclear world into a multipolar nuclear system for reasons that realists themselves have acknowledged: multipolar systems, especially those that are unbalanced, are more war prone than bipolar systems.²⁰

Rational Deterrence Theory and Its Limits

Rational deterrence theory as explained and argued by scholars and policy analysts during the Cold War was based on the relationship between the capabilities of states and their willingness to threaten or to use those capabilities under conditions of threat.²¹ In a crisis between two nuclear-armed states, each will estimate the relative costs and benefits of striking first, on one hand, compared to the estimated costs and benefits of waiting to be attacked before retaliating. The logic of rational deterrence theory favors waiting, as opposed to attacking, so long as the defender has survivable second-strike forces, adequate warning information, and post-attack command and control of its nuclear forces to ensure a prompt and unacceptable retaliation against the attacker. Under these conditions, in which the attacker can devise no war plan that provides for a first strike with impunity, the defender has the advantage and deterrence is assumed to withstand the stress of crisis.²²

This model of nuclear deterrence rationality is not to be despised or dismissed casually. It offers important clues as to the development of nuclear force structures and to the posturing of nuclear delivery systems and command and control in times of crisis. For example, weapons and command-and-control systems that are vulnerable to first strikes invite attack and are therefore assumed to be destabilizing. Survivable weapons and command systems, to the contrary, contribute to an arms race and to crisis stability. But despite the fact that rational deterrence leads to useful inferences about force structure and operational habits that are contributory to stability, it falls short of providing sufficient insight into human and organizational behavior that might be more important in crisis management. In addition, rational deterrence theory is not necessarily what it seems, even in its own terms and based on its own interior logic.

That rational deterrence falls short of accounting for the causal relationships in large organizations and small groups that make the decisions for peace or war has been emphasized by political scientist Scott D. Sagan in studies of American and other nuclear crisis management. Sagan is especially informative on the proclivities of military organizations, including their organizational mind-sets and standard operating procedures that could complicate crisis management and contribute to an outbreak of inadvertent nuclear war or escalation. According to Sagan, among the possibly crisis-dysfunctional proclivities of military organizations is their preference for preemption or for preventive war: getting in the first blow, should war appear to be inevitable.²³ This understandable propensity for seizing the initiative in the twilight between peace and war makes sense under many conditions of conventional warfare. But in a crisis between two nuclear-armed states, the organizational proclivity for first strikes becomes more of a liability than an asset: preparations for a preemptive strike or preventive war might be noticed by the adversary and trigger its own preemption. Organizational proclivities or standard operating procedures that drive states toward a reciprocal fear of surprise attack conflict with the political objective of nuclear crisis management.²⁴

Thus the case has been made for the limitations of rational deterrence theory in taking into account variables inside the black box of decision making and organizational behavior. Even critics of rational deterrence on this point concede, by implication, that once outside the black box,

it still makes sense and its logic remains, by and large, compelling. This concession may be premature.

Rational deterrence theory is built on a truncated view of rationality. It is a rationality of means but not of ends. End-rationality would also ask about the implications for society, culture, and polity, including humane values, of the various courses of action being plugged into rational deterrence and systems theory. Does the willingness to engage in a nuclear war to save a society or validate a policy ever make sense? Perhaps it does, in a very scenario-dependent manner. Deterrence theorists contend that socially unacceptable threats of nuclear retaliation are morally good because they work well enough, and they cite the Cold War as evidence in favor of their belief. Neither the United States nor the Soviet Union fired a nuclear weapon against the other's military forces or state territory despite 40-plus years of global rivalry and a number of serious political crises. Trafficking in nuclear fear may be a dirty business, but it works wonders because even politicians and generals overdosed on nationalism or testosterone cannot pretend that nuclear war is truly winnable or define victory at an acceptable cost.

Historical Perspectives

The Cold War provides mixed evidence for the value of nuclear deterrence as a guaranty pact for peace. The absence of large-scale war between the Soviet Union and the United States and their allied coalitions was overdetermined: by politics, technology, memories of World War II, and the ability of both superpowers to get most of their objectives without war.²⁵ Despite all these inhibiting factors, serious confrontations that could have led to an outbreak of war, including nuclear war, marked the Cold War; the Cuban missile crisis of 1962 was only the most publicized and obvious. The peaceful end of the Cold War was an historical anomaly to which nuclear weapons and deterrence made a contribution—but only a partial one. The Cold War endgame was driven primarily by factors internal to the USSR, especially by Soviet Pres. Mikhail Gorbachev's skill in dismantling the old Soviet power structures and his equally breathtaking inability to replace the old order with anything durable and legitimate.²⁶ Gorbachev's desire to hold the Soviet Union together, in competition with Russian Pres. Boris Yeltsin's eagerness to lead the march out from under the Soviet umbrella, created a state of uncertainty within Russia that gave breathing space for diplomatic, as opposed to

military, endgames in Germany. It was a subsystem-dominant endgame with a systemic overlay, not the reverse.

The entire Cold War endgame rested on the willingness of both Soviet and Western alliances to agree to the peaceful reunification of Germany. As late as 1989 this still appeared as a political impossibility, resisted by hard-liners in Russia and in Western Europe. Against the odds it happened, on account of the determination of German Chancellor Helmut Kohl and Gorbachev. Systems logic would have dictated a more cautious approach as less threatening to stability within the Soviet power structures and between East and West Germany. The ebullient personalities of the two heads of state and their willingness to accept risk under extraordinarily fluid political conditions made legitimate the repolarization of the continent of Europe. Nuclear weapons and deterrence did play a supporting role here: military adventurism by hard-liners East and West in those troubled but fruitful political times was harder to advocate or to undertake on account of the enormous American and Soviet nuclear arsenals hanging in the background.

Therefore the peaceful end to the Cold War requires that we acknowledge the significance of realist theory and rational deterrence theory for explaining causal forces that contributed to this unexpected but welcome outcome. Realism and rational deterrence were not irrelevant to explanation and prediction of policy outcomes during the Cold War or in the complicated interactions among states that brought the Cold War to a conclusion without war. System structure and polarity did matter; the “long peace” between 1945 and 1991 cannot be explained without paying careful attention to the sizes of the larger billiard balls, the shape of the table, and the movements back and forth across the table as the balls passed or collided with one another. But the initial velocity and direction for each ball was provided by an actor, not a system, and some balls had enough force or unpredictability to restructure the game, at least temporarily. A bipolar system remained in place from the end of World War II until the end of the Soviet Union, but this bipolarity was highly conditional: for most of the Cold War it was only a bipolarity of military power for mass destruction.

Cold War experience, *inter alia*, shows how realism and rational deterrence offer valuable but highly contingent explanatory and predictive insights pertinent to world politics and foreign policy decision making. Realism and rational deterrence models share with other rational choice

theories the attributes of parsimony and an explicitly defined connection between causal and dependent variables. But as explanations and predictors of behavior related to peace and war, they are containers only as good as the historical understanding that is poured into them.

Deterrence, Crisis Management, and World War I

Consider another example: the July Crisis of 1914. From a systems theory perspective, it made little sense for the great powers to align themselves on two opposed sides of tightly cohesive and antagonistic blocs as opposed to maintaining the flexibility of a five- or six-sided balance of power system. It made even less sense for some states in these alliances, especially Germany, to rely upon prompt mobilization and first-strike offensives as a deterrent when in fact they mainly served as provocations and as proximate causes for escalation. Here it must be conceded that some countries in July and August 1914 were more reliant on prompt mobilization and offensive strategies than others. Germany's Schlieffen Plan, for example, assumed a rapid and decisive victory in the western theater of operations against France while, on Germany's eastern flank, Russian mobilization would lag behind the pace necessary for a prompt offensive against Germany.²⁷ Despite these nations' varying mobilization speeds and reaction times, they shared an inability to understand that they were caught up in a process of risk management in addition to the processes of competitive arms building and the avoidance of military defeat by preemption.²⁸

The system of great power relationships that created a tolerable and mutually beneficial stability, first forged by German Chancellor Otto von Bismarck in the 1880s, was put at risk by leaders who only poorly understood the implications of their preemption-dependent war plans and alliance commitments. Regardless of the variations in detail among the plans and expectations of members of the Triple Entente and Triple Alliance, a shared default was the assumption of irreversibility once the decision to mobilize had been taken. Leaders in countries as otherwise different as Russia and Germany made this fatal assumption of irreversible mobilization. Compared to German prewar mobilization planning, Russian mobilization planning was torn by internal disagreements about strategic priorities: an attack on Austria alone or a simultaneous attack on Austria and Germany. Although the tsar assumed that an option existed for a partial, as opposed to a total, mobilization during the terminal

stages of the July crisis, the Russian general staff had in fact prepared no such option, and he was eventually—and reluctantly—persuaded to order total mobilization.²⁹ This Russian decision in turn accelerated the pace of German mobilization. There is no smugness in this critique. Political leaders in 1914 faced challenging circumstances in foreign and domestic policy. As historian Gordon A. Craig writes of Germany's first chancellor in World War I, Theobald von Bethmann Hollweg, "As soon as hostilities commenced, he found himself in a situation in which nearly all the political parties, the business community, a high proportion of the university professoriate, the bulk of the middle class, and significant portions of the working class were desirous of the most ambitious kind of territorial expansion and were sure that the war would make this possible. Simultaneously, he had to deal with a military establishment that had greater freedom from political control and a higher degree of public veneration than any similar body in the world."³⁰

The July Crisis of 1914 also offers cautionary tales about the validity of rational deterrence theory. Leaders in July and August 1914 should have been deterred for the reason that the military technology of the day favored defensive strategies and protracted war, which would exhaust the treasuries and manpower of the combatants. Therefore, the great powers having been so informed, they would forbear arms. But leaders were undeterred by the prospect of a longer and more destructive war despite the evidence of costs exceeding benefits.³¹ Instead of confronting the evidence, they invented their own version of a future in which rapid mobilization and prompt offensives would expedite a short, decisive war.³²

Equally defiant of rational choice theory was the willingness of the powers to continue the war long after the predictions of short war and decisive victory had been falsified, to the utter destruction of four empires and the economic devastation of all major combatants save the late-arriving United States. The adherence of warlords to dysfunctional plans guaranteeing only stalemate and exhaustion can be blamed entirely—and unfairly—on the generals themselves, as some have done. But what happened to diplomacy and political leadership at the very time it was called upon to think in cost-benefit terms about strategy, that is, the bridge between policy objectives and military operations?³³ As political scientist Colin S. Gray has noted, "Because strategy can only be done through the agency of the tactical, it has to be entirely hostage to the


consequences of tactical performances, friendly and unfriendly. Whether tactical performance advances strategic designs, both grand and lesser, should not be left to be resolved by *fortuna*, and it most certainly cannot be left to the professional or instinctive wishes of narrowly military soldiers.”³⁴

Of course, history does not repeat itself, at least not in detail, so comparisons of present and probable future international systems with the situation that obtained in August 1914 must take into account the differences as well as the similarities that apply.³⁵ The challenge for future leaders in the Middle East, South Asia, and East Asia will be not only to maintain a balance of military power but also to develop the necessary decision-making skills in crisis management and escalation control.³⁶

Conclusion

Realist and rational deterrence theories offer some important insights about international politics, and they have a justifiable center of gravity based on recognition of the importance of military history and strategy. But theorists and policy makers need to be careful in borrowing from realism and rational deterrence theories, for two reasons. First, even within the system-focused internal logic of realist theories, weaknesses exist—apart from the apparent negation of domestic politics. The realist actor is simply too one dimensional. Second, risk-acceptant leaders operating from a perspective of offensive realism and in possession of nuclear weapons are dangerous in a way that is not obvious. They might not *use* nuclear weapons by actually firing them. Instead they could use nuclear weapons to create a new regional ladder of escalation. A new regional ladder of escalation in the Middle East or South and East Asia could be created by combining existing and new nuclear forces with advanced technology for command and control, communications, intelligence, precision strike, and cyber operations.

This combination of older technology (nukes) with new technology for seeing and knowing the battlespace, for stealthy and possibly non-attributable cyber attacks, and for advanced conventional precision-strike weapons could default in crises into excessively fast decision making and preemptive attacks.³⁷ Already, interest on the part of some Asian powers in antiaccess/area denial defense strategies has encouraged attention to countermeasures that would include prompt and longer range air and missile attacks in addition to electronic and cyberwarfare. Two variables will help to determine whether realist and rational deterrence

theory will remain compelling in a world of nuclear plenty: (1) whether the distribution of power among nuclear-armed actors is relatively balanced or unbalanced and (2) whether the aims of nuclear states are status quo or revisionist in their attitude toward the existing distribution of international power and other values. Realism and rational deterrence have a lot to say about the first set of variables but understate the importance of the second set. Whether from a realist or alternative perspective, history is not deterministic. Additional nuclear proliferation beyond the nine existing de facto nuclear weapons states is neither guaranteed nor precluded by systemic or other factors. The relative military potential of state actors matters a great deal for the future of deterrence; so, too, do the aspirations and motivations of the future nuclear heads of state. In addition, leaders' understandings of technology and its implications for deterrence and for warfare are decisive inputs into the equation of decision for war or for peace.³⁸ Emerging and futuristic technologies may turn both neorealist and domestic-focused theorists' assumptions about the future causes of war, about the efficacy of deterrence, and about the rank order of major powers into yesterday's news.³⁹ 

Notes

1. An informative discussion of nuclear proliferation issues appears in Andrew Futter, *The Politics of Nuclear Weapons* (London: Sage Publications, 2015), chapter 3 and chapters 5–7. See also Peter D. Feaver, "Nuclear Command and Control in Crisis: Old Lessons from New History," in *Nuclear Weapons Security Crises: What Does History Teach?*, ed. Henry D. Sokolski and Bruno Tertrais (Carlisle, PA: Strategic Studies Institute and US Army War College Press, July 2013), 205–25. Feaver classifies participants in the proliferation debates as paleo- or neopessimists and paleo- or neo-optimists, with pertinent references for each school.

2. Additional expert discussion on these issues appears in Henry D. Sokolski, *Underestimated: Our Not So Peaceful Nuclear Future* (Carlisle, PA: Strategic Studies Institute and US Army War College Press, January 2016), 4–29; Richard D. Burns and Philip E. Coyle III, *The Challenges of Nuclear Non-Proliferation* (Lanham, MD: Rowman and Littlefield, 2015), 69–94, 133–60; and Matthew Kroenig, "The History of Proliferation Optimism: Does It Have a Future?" in *Moving Beyond Pretense: Nuclear Power and Nonproliferation*, ed. Henry Sokolski (Carlisle, PA: Strategic Studies Institute and US Army War College Press, June 2014), 45–89.

3. Kenneth N. Waltz, *The Spread of Nuclear Weapons: More May Be Better*, Adelphi Papers no. 171 (London: International Institute of Strategic Studies, 1981); also by Waltz, "Nuclear Myths and Political Realities," *American Political Science Review* 84, no. 3 (September 1990): 731–45, <http://www.jstor.org/stable/1962764>; and his chapters in Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton, 1995). The continuing relevance of nuclear deterrence for international peace and stability is argued persuasively in Elbridge Colby, "Is Nuclear Deterrence Still Relevant?," in *Deterrence: Rising Powers,*

Rogue Regimes, and Terrorism in the Twenty-First Century, ed. Adam B. Lowther (New York: Palgrave-Macmillan, 2012), 49–73. The particular challenges posed by globalization for nuclear nonproliferation are discussed in Francois Heisbourg, “Nuclear Proliferation—Looking Back, Thinking Ahead: How Bad Would the Further Spread of Nuclear Weapons Be?,” in Sokolski, *Moving Beyond Pretense*, 17–44. Other arguments for a positive association between the spread of survivable nuclear forces and international stability appear in Martin Van Creveld, *Nuclear Proliferation and the Future of Conflict* (New York: The Free Press, 1993). Waltz’s important work on structural realism applied to world politics is his *Theory of International Politics* (Reading, MA: Addison-Wesley, 1979).

4. For a sorting of realist views on international politics, see John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: W. W. Norton, 2001), 14–22. See also Hans J. Morgenthau, *Politics among Nations: The Struggle for Power and Peace* (New York: Alfred A. Knopf, 1948). Paul R. Viotti and Mark V. Kauppi divide international political theories into realist, pluralist, and globalist schools, taxonomy similar to that offered by Kalevi J. Holsti. See Viotti and Kauppi, *International Relations Theory: Realism, Pluralism, Globalism* (New York: Macmillan, 1993), 61–227; and Holsti, *Peace and War: Armed Conflicts and International Order* (Cambridge, UK: Cambridge University Press, 1991), 328. See also Holsti’s comments on the roots of realism and neorealism, *Peace and War*, 329–30. An excellent summary and critique of neorealist views is provided by Robert O. Keohane, “Theory of World Politics: Structural Realism and Beyond,” in *Political Science: The State of the Discipline*, ed. Ada W. Finifter (Washington, DC: American Political Science Association, 1983), and reprinted in Viotti and Kauppi, *International Relations Theory*, 186–227.

5. On the other hand, John Mearsheimer is correct to note that realism is inconsistent with much American public opinion and with a great deal of US public diplomacy because it is “at odds with the deep-seated sense of optimism and moralism that pervades much of American society. Liberalism, on the other hand, fits neatly with those values.” Mearsheimer, *Tragedy of Great Power Politics*, 23. Jack Snyder contrasts realism, liberalism, and idealism as rival theories of international relations in his essay, “One World: Rival Theories,” in *Essential Readings in World Politics*, 5th ed., ed. Karen A. Mingst and Jack L. Snyder (New York: W. W. Norton, 2014), 2–10.

6. The term “system” has many uses in international politics and in political science. Structural-realist theories of international politics emphasize the causal importance of system structure: numbers and types of units in the system and the distribution of military and other capabilities among those units. Other variations of systems theory emphasize the interactions among components of the system, including the interdependence of the actors or units. For a concise discussion of systemic theories of international politics, see James E. Dougherty and Robert L. Pfaltzgraff Jr., *Contending Theories of International Politics*, 4th ed. (New York: Longman, 1997), 100–134.

7. Bruce Bueno de Mesquita and David Lalman, *War and Reason: Domestic and International Imperatives* (New Haven, CT: Yale University Press, 1992).

8. *Ibid.*, 17.

9. Mearsheimer’s capstone defense of offensive realism, *Tragedy of Great Power Politics*, provides ample evidence for this point. Vital interests, as used here, refer to interests over which states resist compromise and for which they are willing to go to war. See Donald M. Snow, *National Security: Defense Policy in a Changed International Order* (New York: St. Martin’s Press, 1998), 173–80.

10. Bueno de Mesquita and Lalman, *War and Reason*, 9, 266. These authors acknowledge that there are variations among realist theorists: “We present the (neo)realist view as a paradigm-

matic ideal type within which numerous contending theories currently exist. All such theories share a common core of ideas that derogate domestic politics as a central concern of international affairs by emphasizing external structural circumstances and a common power-or-security enhancing goal as determinants of state actions" (ibid., 13).

11. Robert Jervis, *System Effects: Complexity in Political and Social Life* (Princeton, NJ: Princeton University Press, 1998), 92–93 passim.

12. Waltz, *Theory of International Politics*, 80.

13. Jervis, *System Effects*, 109.

14. Kenneth Waltz, *Man, the State and War* (New York: Columbia University Press, 1959). Explanation and prediction in international politics require three levels of analysis, or images, according to Waltz in this study. His later work, *Theory of International Politics*, as above, relies more exclusively on a single level of analysis: the international system and its interactions.

15. For example, John Mueller argues that US and European Cold War leaders' memories of the destruction caused by World War II would have created risk-averse perceptions of a possible World War III even without the existence of nuclear weapons. See Mueller, *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al-Qaeda* (New York: Oxford University Press, 2010), 29–42.

16. See Morton Kaplan, *System and Process in International Politics* (New York: John Wiley and Sons, 1957), for an early and pioneering effort for its time. International systems theories are classified and critiqued in Jervis, *System Effects*, 93–124.

17. Waltz, "The Stability of a Bipolar World," *Daedalus* 93 (Summer 1964): 881–909, <http://www.jstor.org/stable/20026863>; and Waltz, *Theory of International Politics*, 170–1, cited in Jervis, *System Effects*, 118.

18. See Stephen M. Walt, *Taming American Power: The Global Response to U.S. Primacy* (New York: W. W. Norton, 2005); and Barry R. Posen, *Restraint: A New Foundation for US Grand Strategy* (Ithaca, NY: Cornell University Press, 2014), 69–134.

19. For example, see John J. Mearsheimer and Stephen M. Walt, "The Case for Offshore Balancing: A Superior US Grand Strategy," *Foreign Affairs* 95, no. 4 (July/August 2016): 70–83, <https://www.foreignaffairs.com/articles/united-states/2016-06-13/case-offshore-balancing>. The concept of grand strategy is concisely defined and explained in Posen, *Restraint*, 1–5 passim. See also: B. H. Liddell Hart, *Strategy*, 2nd revised ed. (New York: Meridian, 1967), 353–60.

20. Mearsheimer, *Tragedy of Great Power Politics*, 337.

21. Rational decision making, in the present context, implies that decision makers employ the form of rationality called "expected-utility maximization" with regard to their chosen preferences, regardless of the evaluation of those preferences by outsiders. See Bruce Bueno de Mesquita, *The War Trap* (New Haven, CT: Yale University Press, 1981), 29–33 passim. Bueno de Mesquita offers an alternative model in "A New Model for Predicting Policy Choices: Preliminary Tests," *Conflict Management and Peace Science* 28, no. 1 (February 2011): 65–87, <http://doi.org/bhk8hx>.

22. For insights on deterrence logic, see Andrew Futter, *The Politics of Nuclear Weapons* (London: Sage Publications, 2015); Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt–Times Books, 2012); Adam B. Lowther, ed., *Deterrence: Rising Powers, Rogue Regimes, and Terrorism in the Twenty-First Century* (New York: Palgrave-Macmillan, 2012); Michael Krepon, *Better Safe than Sorry: The Ironies of Living with the Bomb* (Stanford, CA: Stanford University Press, 2009); Lawrence Freedman, *Deterrence* (Cambridge, UK: Polity Press, 2004); Patrick M. Morgan, *Deterrence Now* (Cambridge, UK: Cambridge University Press, 2003); Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (New York: Palgrave-Macmillan, 2003); Keith B. Payne, *The Fallacies of Cold War*

Deterrence and a New Direction (Lexington, KY: University Press of Kentucky, 2001); Colin S. Gray, *The Second Nuclear Age* (Boulder, CO: Lynne Rienner, 1999); Colin S. Gray, *Modern Strategy* (Oxford, UK: Oxford University Press, 1999), chapters 11–12; Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington, KY: University Press of Kentucky, 1996); and Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, NY: Cornell University Press, 1989).

23. In addition to Sagan's works cited earlier, see Sagan, "The Perils of Proliferation in South Asia," in *South Asia in 2020: Future Strategic Balances and Alliances*, ed. Michael R. Chambers (Carlisle, PA: Strategic Studies Institute and US Army War College Press, November 2002), 191–227.

24. On this point, see also Graham T. Allison, *Essence of Decision: Explaining the Cuban Missile Crisis* (Boston: Little, Brown, 1971), especially his discussion of the "organizational process" and "bureaucratic politics" models of decision making.

25. Mueller, *Atomic Obsession*, 40–42 passim.

26. See Raymond L. Garthoff, *Soviet Leaders and Intelligence: Assessing the American Adversary during the Cold War* (Washington, DC: Georgetown University Press, 2015), 74–94.

27. See Fritz Fischer, *War of Illusions: German Policies from 1911 to 1914*, trans. Marian Jackson (New York: W. W. Norton, 1975), and sources in later notes.

28. On the concepts of risk and uncertainty, see Bueno de Mesquita, *War Trap*, 33–40.

29. Stephen J. Cimbala, "Steering Through Rapids: Russian Mobilization and World War I," in *World War I*, ed. Michael Neiberg (Aldershot, UK: International Library of Essays on Military History, 2005), 3–25. See also D. C. B. Lieven, *Russia and the Origins of the First World War* (New York: St Martin's Press, 1983).

30. Gordon A. Craig, "The Political Leader as Strategist," in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, ed. Peter Paret (Princeton, NJ: Princeton University Press, 1996), 482.

31. According to Michael Howard, military and political leaders in World War I "were neither blind to the likely consequences of their attacks nor ill-informed about the defensive powers of twentieth-century weapons. None of them expected that the war could be won without very heavy losses." Michael Howard, "Men Against Fire: The Doctrine of the Offensive in 1914," in *Makers of Modern Strategy*, 510.

32. For example, see Gerhard Ritter, *The Schlieffen Plan: Critique of a Myth* (London: Oswald Wolff, 1958), 134–48, for text of Schlieffen's "great memorandum" of December 1905; L. C. F. Turner, "The Significance of the Schlieffen Plan," in *The War Plans of the Great Powers, 1880–1914*, ed. Paul M. Kennedy (London: Allen and Unwin, 1979), 199–221; Holger M. Herwig, "The Dynamics of Necessity: German Military Policy during the First World War," in *Military Effectiveness*, vol. 1, *The First World War*, ed. Allan R. Millett and Williamson Murray (Boston: Unwin Hyman, 1988), 80–115; Fritz Fischer, *War of Illusions*; Lieven, *Russia and the Origins of the First World War*; Sidney Bradshaw Fay, *The Origins of the World War*, vol. 2, *After Sarajevo: Immediate Causes of the War*, 2nd revised ed. (New York: The Free Press, 1966), 446–81; and William C. Fuller Jr., *Strategy and Power in Russia 1600–1914* (New York: The Free Press, 1992).

33. For the notion of a strategy bridge, see Colin S. Gray, *The Future of Strategy* (Cambridge, UK: Polity Press, 2015), 24–40.

34. *Ibid.*, 40.

35. Graham Allison, "Just How Likely Is Another World War?," *The Atlantic*, 30 July 2014, <http://www.theatlantic.com/international/archive/2014/07/just-how-likely-is-another-world-war/375320/>.

36. See Bracken, *The Second Nuclear Age*, chapters 5–7. Also informative on this point is Gary Schaub Jr., “Are Rogue Regimes Deterrable?,” in Lowther, *Deterrence: Rising Powers, Rogue Regimes, and Terrorism in the Twenty-First Century*, 135–61.

37. See, for example: Ellen Nakashima, “In Cyberwarfare, Rules of Engagement Still Hard to Define,” *Washington Post*, 10 March 2013, https://www.washingtonpost.com/world/national-security/in-cyberwarfare-rules-of-engagement-still-hard-to-define/2013/03/10/0442507c-88da-11e2-9d71-f0feafdd1394_story.html; and Choe Sang-Hun, “South Korea Says It Misidentified Source of Cyberattack,” *New York Times*, 22 March 2013, http://www.nytimes.com/2013/03/23/world/asia/south-korea-says-it-misidentified-source-of-cyberattack.html?_r=0.

38. For a pertinent contemporary issue, see Martin C. Libicki, *Crisis and Escalation in Cyberspace* (Santa Monica, CA: RAND Corporation, 2012), 73–121.

39. T. X. Hammes, “Cheap Technology Will Challenge U.S. Tactical Dominance,” *Joint Force Quarterly* 81 (2nd Quarter 2016): 75–84, <http://ndupress.ndu.edu/Media/News/News-Article-View/Article/702039/cheap-technology-will-challenge-us-tactical-dominance/>.

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