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VIEWPOINT

ICONS OFF THE MARK
Waltz and Schelling on a Perpetual Brave Nuclear World

Harald Müller

In two landmark articles, longtime scholars Kenneth N. Waltz and Thomas C. Schelling have re-emphasized the utility of nuclear deterrence over nuclear nonproliferation (Waltz) and nuclear disarmament (Schelling). While the thrust of the articles is seemingly different, both are rooted in the same intellectual ground: an epistemology that assumes problem-free inferences, drawn from past experiences, are applicable in future scenarios; a foundational rooting in strategic rationality that entangles them in unsolvable contradictions concerning comparable risks of different nuclear constellations, namely deterrence versus proliferation and disarmament; and a bias in framing the empirical record that makes nuclear deterrence more conducive to security than nuclear disarmament. The common normative-practical denominator, then, is to let a nuclear weapon-free world appear both less desirable and less feasible than it might actually be.

KEYWORDS: Nuclear deterrence; nuclear disarmament; nuclear nonproliferation

The last few years have brought us remarkable contributions by two academic icons to the nuclear debate: the late Kenneth N. Waltz defended in *Foreign Affairs* his daring proposition that "more may be better" by applying it to Iran's nuclear program, and Thomas C. Schelling warned in *Daedalus* against giving up nuclear deterrence since the devil we know is more conducive to preserving stability and serving world and regional stability than nuclear disarmament—the dangerous devil we do not know.[1] At first glance, there seems to be a huge difference between the two authors: Waltz postures as a nuclear revolutionary, defying the conventional wisdom of nonproliferation and counterproliferation, in general and in the specific case of Iran; his commitment to the benefits of nuclear deterrence is absolute and he takes it to extremes from which Schelling refrains. Schelling bridges this seeming inconsistency through the concept of "responsible" states, implying the possibility of "irresponsible" ones and providing a reason not to promote runaway proliferation (e.g. to Iran). Waltz would not accept this distinction as it contradicts his fundamental assumptions that the state "system is composed of like units."[2]

Despite this difference, my argument is that the two authors share a core belief and strategic position. Both are committed to the eternal continuation of nuclear deterrence. Schelling sees in it the lesser evil; for Waltz, its not the basis of perpetual peace, but it at least accounts for the perpetual absence of major war, based on nuclear

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weapons' "peace-promoting" role.[3] I make four critical arguments in this viewpoint. First, Waltz and Schelling are entangled in epistemological operations that violate conventional rules for inference from past to future, and, in this context, make unconditional assertions on the future course of history that are not tenable based on present knowledge. Second, both use arguments that are incoherent with the rationalist foundations on which they ground their belief in deterrence. Third, both frame empirical observations with a view to make them fit their arguments, notably in the way they narrate the historical record with a view to make it compatible with the dominant Western understanding of strategic rationality that is the basis for deterrence theory. And fourth, as a consequence, the stance of both tends to—and is meant to—undermine considerations on the possibility of getting rid of nuclear weapons: behind the scientific attitude hides a strong normative position. Given the prominence of these two authors and their representativeness for neo-realism and rationalist strategic analysis, respectively, an in-depth discussion of their arguments is in order as they are archetypical for academically-founded objections to the possibility and desirability of a world without nuclear weapons.

After criticizing the basic assumptions as well as the empirical argumentations and ensuing inferences of both authors, I conclude that nuclear deterrence is a much more brittle basis for stability, and nuclear disarmament a much less risky endeavor than Waltz and Schelling suggest.

Promoting An Iranian Bomb: Waltzian Irrealism

The thrust of Waltz's 2012 *Foreign Affairs* article is that we should not panic over Iran's nuclear program because its final success would establish at long last a nuclear balance in the region and therefore dissolve essential causes of instability.

Waltz's structural realist approach to international relations has attracted strong criticism on epistemological grounds. To begin, the claim to universal *scientific* truth by a group of theorists (the realists) with a very particularist reading of the world has been criticized as a power-motivated move to impose unjustified hegemony in the academic field.[4] Critics have also attacked the reification of "structure" which, in their view, must be seen as a social construction or, in the more radical critique, as a power-based discursive imposition that helps stabilize and perpetuate a distribution of power that is at heart violent and unjust.[5] By the *epistemological* operation of pretending firm knowledge about a structure that is unchangeable, neo-realism—according to its critics—is framing an *ontology* of structure as a fixated given, while in fact social relations are contingent, fluid, and thus changeable.[6] It must be emphasized in this regard that political scientist Alexander Wendt's assertion that neo-realism cannot explain structural change contains the epistemological statement that the theory denies the possibility to generate knowledge on change (other than in the distribution of power and, consequently, in polarity).[7] The epistemology-inspired reification of structure, in turn, has (epistemological) consequences for the realist reading of reality: as the notorious man with a hammer sees nails everywhere but nothing else, realists see the sameness of structure across time and space, even where structure is changing, and, in addition, they ignore or dismiss features of structure (the ideational ones) which do not fit their materialist ontology. At the same

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time, by pretending a neutral observer status unaffected by the observed objects of international relations, neo-realism conceals its normative position in support of the status quo, i.e. the powers that be, and how it is itself constituted by the constructed social reality which it helps to perpetuate.[8]

My own critique of Waltz's epistemology is less fundamental; in fact, it could be easily situated in a positivist research program. I deal strictly with the inferential operations concerning the realist concept of deterrence. The argument in this section does not refer to the empirical record, but rather focuses strictly on the epistemological problem. Later on, I will address Waltz's reading of empirical nuclear history.

My epistemological critique relates to the inferential operation by which Waltz establishes his proposition that deterrence will provide assurance against nuclear war and some reasonable assurance against all war even if and when more states will acquire nuclear weapons and without regard to the particular ideology, system of rule, or psychological disposition of the leadership of the nuclear possessor in question. Waltz bases his proposition on the history of nuclear deterrence. In his interpretation, history proves that nuclear weapons, via the horrifying damage that nuclear war entails, introduce a measure of prudence into the attitude and behavior of every leadership that comes into a position to decide upon the use of these weapons against other states possessing them. Since survival is the imperative under which governments in an anarchic structure operate, the specter of nuclear war prohibits political moves that would start or provoke that calamity. This theoretically deduced proposition, in Waltz's view, has been vindicated by the experiences of the nuclear age. At this point, I will not dispute this interpretation but rather try to understand his epistemological logic.

The same argumentation in Waltz's now classic 1981 Adelphi Paper—which coined the formula "more may be better" with regard to horizontal nuclear proliferation—is still qualified with probability statements such as:

- "Nuclear weapons and an appropriate doctrine for their use *may make it possible* to approach the defensive-deterrent ideal, a condition that would cause the chances of war to dwindle." (Emphasis added.)
- "Contemplating the nuclear past *gives grounds for hoping* that the world will survive if further nuclear powers join today's six or seven." (Emphasis added.)
- "Nuclear weapons have reduced the chances of war between the United States and the Soviet Union and between the Soviet Union and China. One *may expect them* to have similar effects elsewhere. Where nuclear weapons threaten to make the cost of wars immense, who will dare to start them? Nuclear weapons *make it possible to approach* the deterrent ideal." (Emphasis added.)[9]

In his 2012 article, however, Waltz employs formulations that suggest unqualified, unconditioned truth claims such as, "History shows that when counties acquire the bomb, they feel increasingly vulnerable and become acutely aware that their nuclear weapons make them a potential target in the eyes of major powers. This awareness discourages nuclear states from bold and aggressive action," or "If Iran goes nuclear, Israel and Iran will deter each other, as nuclear powers always have. … Once Iran crosses the

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nuclear threshold, deterrence will apply."[10] The use of the present tense in these sentences suggests a "law of history" rather than a more cautious probability assessment.[11]

Thus, Waltz takes his purported finding about the effects of nuclear weapons during the Cold War as a sufficient reason to make an unconditional forecast of them having the same effects in a counterfactual scenario, Iran having nuclear weapons. The deduction of a historical law from limited experience and its applying to all future is epistemologically untenable, as philosopher David Hume explained three centuries ago. Hume argued that, even in nature, the sequence of "cause" and "effect" as experienced by human perception is no guarantee that this sequence will occur uniformly in the future, as it is unjustified to draw ontological conclusions from experience, which is an epistemological process.[12] For human affairs, politics included, this skeptical notion applies with even greater force: In social and political affairs, historical experience may be a guideline, but it is no safe basis to make categorical predictions with a claim of 100 percent certainty. For one, this experience might be context-dependent and contexts may change; and secondly, human affairs cannot get rid of the element of contingency embedded in the influence of chance, chaos (in the sense of chaos theory), or individual idiosyncrasy (think of Adolf Hitler). For these reasons, the occurrence of singularity is a persistent possibility in history, as are random deviations from average behavior. Inferences from historical experience can only be probabilistic, but never absolute. Categorical hypotheses like "major war between two nuclear armed powers cannot happen" or "nuclear deterrence will always stabilize bilateral and regional relations" are neither scientific nor can they be based on history. They are simply beliefs. Economist Carl Lundgren's recent effort in these pages to calculate the probability of nuclear war during the Cold War in a methodologically stringent way is a much more reliable approach to this matter than ideology-based belief, and Lundgren's results of a nuclear war probability of more than 1 percent per Cold War year is a highly sobering reminder of the risks incurred.[13] The epistemological objections by non-positivist critics of Waltz's neo-realist theory are thus confirmed by an immanent, quasi-positivist look at his epistemological operation concerning his concept of nuclear deterrence: he is reifying an allegedly fixated structure out of its original context.

Rationalist Incoherence: Nuclear Mishaps as an Insurance Problem

Thus, instead of postulating historical absolutes, it is more useful to draw on insights from faculties that routinely deal with risk probabilities, such as economics. Waltz never endeavors to do so; this is amazing given that, in his classic "Theory of International Politics," he strived to improve the scientific basis for international relations theory by drawing on economic theory.[14] From this perspective, as Wendt has correctly observed, Waltz's neo-realist system theory has been endowed with an individualist foundation, as the dynamics of the system emerge from the interaction of states acting as individualist, rational security-seekers.[15] Waltz's practical recommendations ("let Iran have nuclear weapons") derive from his analysis of how rational governments should optimize their states' security. My claim is that his recommendation is incompatible with in-depth rationalist reasoning, and I will justify this claim by using a classical rationalist tool, insurance economics. Insurance economics centers on the prudential economic utilitarian

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(the insurance company) who calculates risk (of the duty to make good on paying damages) and tries to prevent loss (by demanding a premium adequate to the size of the risk).

Nuclear war counts as a case of the class of events with low probability and huge negative consequences. In insurance economics, this category of events is known to be particularly difficult to protect against, both physically and economically (in terms of insurance).[16] Of course, nuclear reactor accidents are cases of the same category; these chain reactions also carry an immense destructive potential.

It is thus useful to compare the two large-scale applications of nuclear technology. Generations of civilian nuclear pundits convinced politicians and the public that the probability of civilian reactor accidents was so low that they would not happen. Such arguments did not sway the insurers. Pro-nuclear governments had to impose limits on the liability of energy companies running nuclear power plants in order to motivate insurance companies to offer payable polices. The US Price-Anderson Act, first passed in 1957 and extended several times, served as template for similar laws in other countries. The same philosophy of limited operator liability prevails in the two international conventions on the issue, the Vienna Convention on Civil Liability for Nuclear Damage of 1963 and the Paris Convention on Third Party Liability in the Field of Nuclear Energy of 1960, linked by the Joint Protocol adopted in 1988.[17] The hard-headed world of insurance considerations reveals the concerns of people—executives of insurance companies—who are forced more than anybody else to approach the issue in a rational-choice manner: they were not at all convinced by the stream of reassurances offered by the nuclear advocates. The "residual risk" of an accident occurring was large enough to ask for a limitation on liability. Meanwhile, the said assurances notwithstanding, we have had two catastrophes—Chernobyl in 1986 and Fukushima in 2011—and a close call—Three Mile Island in 1979.[18] Because the Fukushima event concerned three reactors, the number of nuclear accidents with serious damage and significant external consequences stands at five.

Nuclear risk analysis is probably the most sophisticated application of the best analytical tool available to calculate risk. But even this well-established approach is chronically inclined to underrate risk. It does not include multiple effects of a single event (like the simultaneous impact of an earthquake on several safety features), feedback loops in which several defects reinforce each other and their respective effects, or the uniqueness of each single accident, another reason why extrapolating from historical experience is a hazardous exercise.[19]

One should note that the probability of deterrence going wrong is higher than that of a single nuclear accident. Controlling a nuclear reactor means coping with the problematique of the man-machine interface. The "man" factor, i.e. the reactor crew, is united in the mission of, and trained for, preventing the accident. The "machine factor" contains a panoply of safety devices to prevent the reactor from exploding. Nuclear deterrence systems, while dealing with the same technology, are different in two additional complications: First, they pit two man-machine systems against each other in an adversarial constellation. Careful empirical and generic analyses by experts such as Paul Bracken, Bruce Blair, Ned Lebow, and Scott Sagan have taught us that much can go wrong in this double man-machine interface, both at the unit and at the interaction level.[20] At

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each level, mishaps loom: man-made machinery is never completely fail-safe. Malfunctions occur. The interface between man and machine opens the possibility of human error (the Chernobyl accident being probably the most tragic example in the civilian nuclear sector). The hostile interaction among several national deterrence systems adds unambiguously to the risks incurred in crises.[21] The great philosopher of war, Carl von Clausewitz, demonstrated long ago that adversarial interaction has one dominant outcome: the vector goes in incalculable and, most of the time, unexpected directions.[22] The studies of "near misses" by Bracken and others (which have informed Lundgren's calculus of the risk of nuclear war) have revealed that these interactions harbor additional, inherent dangers to deterrence stability as mishaps, malfunctions, or human or technical failure on the one side and misperceptions and miscalculations on the other side can feed on each other.

Second, nuclear reactors are designed to use nuclear energy in a strictly controlled manner. All features are meant to *prevent* any deviation from normal operations. Nuclear deterrence systems, however, are designed both to operate smoothly in peacetime and to be turned to violent use in times of war, with different levels of alert operations in between. That is, part of their mission is to *implement* deviation from normal operations. The reason is that deterrence is believed to be all the more credible the higher the probability of nuclear weapon use will be once the "red line" for the deterring party is crossed. In other words, in order for the *actual* probability of use to be low, the *perceived* probability must be high.[23] It is likely that, since use is well prepared and thus perfectly feasible, insurance companies are likely to drive the insurance premium further upwards.

Why, then, have we seen no nuclear war occur if the probability of one is higher than that of a nuclear reactor accident? The answer may be simple insurance math: because the number of nuclear reactors has been higher by almost two orders of magnitude for one generation than that of adversarial nuclear deterrence dyads which are the appropriate unit of comparison. Global reactor years stood at about 15,000 at the end of 2012; nuclear deterrence dyad years stood at 814, according to my own calculation, and if we count only those of states involved in lasting conflicts, the figure shrinks to 285.[24] With enough proliferation and time, deterrence degenerating into nuclear war will happen with a probability close to one. That nuclear arms racing in the future is likely to be a multipolar, rather than bipolar process, adds further to the risks involved. It is thus safe to assume that, as with nuclear power reactors, deterrence systems are not fail-safe.

Rather than pronouncing the belief that "it will not happen," it is more useful to submit the question of nuclear war to an insurance thought experiment: if there were a global agreement that nuclear weapons could be held by states that would insure themselves against liability for the damages their weapons would cause in the case of nuclear war, would there be companies offering affordable polices without an imposed limit on liability? If not, the belief is unsupportable. I submit—on the basis of experience from the civilian nuclear energy field—that insurance companies would not volunteer to offer full liability protection. Since it is not within the range of the prudential policy of security-seekers to incur risks that are so high that they cannot be insured, Waltz's proposition and recommendation is inconsistent with his theory's rationalist foundations.

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The Nuclear Record: Empirical Observations on Near Misses and Different Strategic Rationalities

Empirical accounts, such as those discussed by Georgetown University professor Colin Kahl in his critique of Waltz, must be reviewed in order to assess how they influence the estimation of probability that nuclear war could occur in a "nuclear-armed crowd."[25] Unfortunately, nuclear history gives us additional reason for this calamitous prediction. Even with low numbers of hostile nuclear armed dyads and the effect of deterrence, we have had five close calls: the 1962 Cuban Missile Crisis, the Soviet-Chinese border war in 1969, the 1983 war scare when the Soviet leadership believed a high-level North American Treaty Organization (NATO) exercise code named Able Archer was a ruse for a decapitating nuclear strike on Moscow; the 1999 Kargil War between India and Pakistan; and the terror crisis between these South Asian states in 2001 and 2002.[26] All five crises demonstrate that the risks of nuclear war are higher than Waltz suggests. The first two, Cuba and Able Archer, are frightening in that they reveal decision makers may lack essential information necessary for smooth crisis management. In 1962, the United States did not know that Soviet tactical nuclear missiles were already operational in Cuba, and that launching authority was pre-delegated to officers on the ground when President John F. Kennedy and his advisors were deliberating an air attack against Cuba, and senior US officials were also ignorant of the practice of US Navy ships to use loud but harmless explosives to force Soviet nuclear-armed submarines to surface. In 1983, NATO was unaware of the alert status of the Soviet nuclear forces. In each case, good luck prevented the ultimate calamity, not the effects of deterrence, as the governmental leaderships which deterrence is intended to influence were not even aware of the existing escalation risks.

The latter three cases are of particular importance for assessing Waltz's empirical argument for his claim that nuclear prudence is a universally valid expression of strategic rationality: he maintains that the Chinese leadership was "much less bellicose after acquiring nuclear weapons in 1964."[27] Yet French intellectual Thérèse Delpech's brief study of this episode draws a quite different picture: the Chinese felt emboldened to settle the issue of "unequal border treaties" with the Soviets by force. When the fighting started in 1969, the Soviets approached the United States to learn how it would react to a Soviet strike against Chinese nuclear installations. The Soviet leadership called off the strike only because Anatoly Dobrynin, the Soviet ambassador in Washington, did not report the genuine US response (concern, but an intention to keep out of the conflict), but instead told his superiors in Moscow that "the United States would not be passive regarding such a blow at China."[28]

Furthermore, Waltz submits that Pakistan and India have both been "more cautious since going nuclear" and "kept the peace" since their nuclear confidence-building agreement in 1991.[29] This is far off the mark. After the two had embarked on escalating series of nuclear tests in mid-1998, Pakistan took up arms against India in the strategically important Kargil area on the initiative of then-Army Chief of Staff General Pervez Musharraf. Musharraf believed that Pakistan's nuclear deterrent enabled it to conduct limited conventional wars because India would not dare to risk a nuclear response by

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using its superior conventional forces against its weaker neighbor. Barely two years later, the Pakistani intelligence service directed a series of terror attacks against India, targeting the regional parliament in Srinagar and the federal parliament building in New Delhi. In both cases, things came very close to escalating. Waltz celebrates these incidents as proof that nuclear weapons are stabilizing in South Asia. This is quite a daring claim. From my perspective, these events prove the potential for escalation even under nuclear circumstances; and they prove, disquietingly, the existence of different types of strategic rationality. Nuclear pundits frequently accuse deterrence skeptics of cultural prejudices against nuclear newcomers; that is, skeptics do not ascribe the potential of rational action to non-Western people. But this is not at all the point here: what Pakistani actions during the crisis prove is not that Pakistan acted irrationally, but that the rationality it employed deviates from the one known to us from the Cold War deterrence system.[30] In fact, Musharraf's calculus was discussed early in deterrence theory under the label "stability-instability paradox," which fed Western anxiety during the Cold War about the possibility that the Soviet Union might grab some territorial prize (notably Berlin) in the belief that the United States would not wish to escalate to the nuclear level.[31] In fact, the Soviets thought this gamble too risky, and the Cold War never saw a case of the stability-instability paradox in action. The Chinese and South Asian cases show, however, that the Cold War patterns of behavior are not necessarily a reliable template for how strategic rationality might be configured in other places.

The point here is not that leaders may enter this type of brinkmanship without the firm determination to control escalation risks, or that they might have pursued related policies before nuclearization.[32] Rather, the point is that leaders believe limited conventional war to be compatible with a mutual nuclear configuration, and that, once fighting has started, the escalation risks caused by factors beyond leadership control (unauthorized behavior, technical mishaps, misperceptions) rise disproportionally. Waltz ignores the Chinese/Soviet case and dismisses the Kargil case to prove that deterrence works.[33] By dichotomizing the deterrence problem (works/doesn't work) he escapes the problem of assessing and comparing risks. Since he does not even consider seriously the stability-instability paradox as an alternative approach to a deterrence configuration, he is comfortably left with a single device to analyze the situation, the doctrine of the absolute reliability of nuclear deterrence. No empirical evidence is able to shatter the resulting certainty.

In the same vein, I do not allege that the Iranian elite are strategically irrational, a view Waltz ascribes to those opposed to an Iranian nuclear arsenal.[34] Quite to the contrary, I hold that the Iranian leadership is strategically rational, and a very skillful bargainer at that. But I think that their behavior since the Islamic revolution proves that they are following a strategic rationality different from the one utilized by mainstream Western nuclear deterrence theory, namely that a deterrence constellation system permits daring brinkmanship moves which were not possible before. Until the end of the Ahmadinejad presidency, Iran called publicly for the elimination of the militarily most powerful state in the region, which is also the only one armed with nuclear weapons. It did so in the knowledge that, due to a tortuous history of perpetual suffering that culminated in the Holocaust, Israel is more sensitive to genocidal threats than any other state in the world,

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and that it has adopted a strategic doctrine to retaliate disproportionally harder compared to the blows the enemy has dealt before.[35] Even today, Iran is doing what is in its yet limited possibilities to bolster words by deeds. It supplies Israel's proximate enemies—Hamas, Islamic Jihad, and Hezbollah—with modern weaponry, trains and instructs them, including on-site by members of the Quds brigade of the Iranian Revolutionary Guards. It is quite obvious, then, that the Iranian leadership has been more risk-prone than Cold War-founded, Western rational deterrence theory would suggest. It remains to be seen whether the change in the presidency will lead to a profound change in policy.

Few Israeli security analysts—and none with whom I have spoken—insinuate the possibility of a premeditated Iranian nuclear attack against their state.[36] Rather, they suggest that Iran might embark on daring strategic and tactical moves short of direct war (including transferring even more sophisticated weaponry to the local allies, and bolstering them with major deployed military and paramilitary units). If, in such a situation, Israel is to uphold deterrence by a show of determination—as rational deterrence theory would require—the risk that an escalation can get out of hand is very real. And then we are back to von Clausewitz again: hostile interaction moving wildly into unplanned directions. The Iran/Israel context is quite possibly the worst interface for stable nuclear deterrence: a politico-strategic culture intrinsically inclined to risk, provoking an adversary oversensitive to vulnerability and intrinsically inclined to overreact.[37] Waltz dismisses this scenario with a cavalier superficiality that takes neither Iranian behavior, nor the South Asian experiences, nor the Israeli mindset properly into account: he asks, "why should Iran be adventurous in the region, especially with a nuclear neighbor like Israel nearby? Such mischief does not serve Iran's security-seeking goals," as if Iran had not already pursued such mischievous policies before.[38] The fundamental weakness of deducing interests ("security-seeking") from the supposed alikeness of governments rather than inducing them from their real-world behavior looms large here.

There is a second scenario of equally disturbing implications. Iran, while playing the strongman in the Middle East, is at the same time an unstable state. It is a multi-ethnic entity with disgruntled minorities (Azeri, Kurdish, Baluchi, Arab). But the majority, i.e. Shiite Iranians, is fragmented as well. Proponents and opponents of the present regime are at loggerheads, and emotions can run high. The proponents are divided into factions, and this division is enlarged rather than reduced by the extraordinary fragmentation of the institutional set-up of the Islamic Republic. The longer the regime lasts, the deeper this fragmentation becomes. A decay of the Iranian state is a plausible scenario wherein one of the most radical wings of the armed branch of the present pro-regime coalition, e.g. parts of the Quds brigade, could get their hands on nuclear weapons.[39]

Either scenario makes the prospect of a nuclear-armed Iran much less attractive than the enthusiastic plea by Waltz suggests. He dismisses the first one by assuming that all states (and their governments) are alike in their struggle for survival, thereby ignoring the particularities of Iranian thinking and practice. Such a belief is discredited by profound studies on different strategic cultures, if not already relegated to the dustbin of history after the reign of the Third Reich.[40] He ignores the second scenario because domestic politics do not figure in his theoretical template.

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In sum, the empirical record does not confirm Waltz's optimistic belief in the virtually guaranteed reliability of nuclear deterrence. First, even where a deterrence configuration introduced a prudential attitude (as between the two superpowers), this did not eliminate high risks due to missing information in crisis situations (and inevitable technical mishaps). Second, prudential thinking is not the necessary product of a nuclear deterrence constellation; there are types of political cultures that produce a different strategic calculus when they enter such a constellation. These framing biases entail a sanguinity about the status quo which makes the present world appear more secure than it actually is.

Believing in Stasis: Schelling's Nuclear Disarmament Scare

Schelling's analysis is based on assumptions that are epistemologically implausible, inconsistent measured by his own ontological assumptions, and marred with distorted empirical assessments.

Thinking about constellations in a nuclear weapon-free world is a complicated epistemological operation. We are trying to construct knowledge about a non-existing context. Principally, there are two methods available for doing so, both working with counterfactual methodology.[41] Counterfactual forward-induction starts from where we are and changes a variable, then constructs the world with this changed variable at time t+1, changes the next variable, constructs the world in t+2 and so on, until a plausible path to the chosen final state of the world is completed. Backwards-induction starts with the final state f, constructs the state f-1 in which all the preconditions are present to move towards f, and eliminates, in a logical sequence, these conditions one by one until we are back to our present world. It is obvious that either process is fraught with speculations, but it is the only plausible method to go from here to there.

Schelling, however, uses a rough, even brutish counterfactual operation: he starts from the assumption that the parameters of a non-nuclear world remain unchanged compared to the present one but for one single element, the existence of nuclear weapons. This scenario in which all parameters remain the same while nuclear weapons disappear is epistemologically a non-starter and very close to Waltz's epistemological proposition that we know the future once we know the past. But it is inconceivable that governments would move beyond minimum nuclear deterrence when they believe a war probable enough to make their security ultimately contingent on having nuclear weapons (if not immediately available, then at least quickly reconstituable). Such governments would stop at perhaps 50, 100, or several hundred deliverable nuclear weapons and leave it at that, while something would be "left to chance."[42] It is obvious that states are not willing to renounce nuclear weapons under current political and military circumstances. What would drive them to do so if nothing changes?

Schelling makes the same mistake as many other pundits of nuclear deterrence: assuming that everything can remain equal in the process of disarmament and that zero can still be achieved (funnily enough, those who ask for *immediate* nuclear disarmament start from the same assumption). Nuclear disarmament with the aim of reaching a real zero is a large-scale effort at political re-engineering. It is bound to progress in small steps that states undertake because they believe these steps enhance their security, or at a

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minimum do not diminish it. Successful steps may enhance mutual trust and thus encourage the parties to go further, and may lead to new requirements (e.g. in transparency and verification) whose implementation leads to even more trust accumulated. The major powers would also undertake efforts to sort out the problems they have with each other. In addition, the lower they go in terms of overall nuclear weapons holdings, the more common interest they develop in keeping third parties from crossing the nuclear threshold; at one point, the joint security interest in keeping the nuclear door closed will surpass the interest to steal a geostrategic march on their peers by offering protection to a would-be proliferator. Going down to low numbers and envisaging the possibility of zero enhances their stakes in order and stability. This moves them in the direction of a great power concert which might provide an indispensable structure for a zero nuclear world, as has been argued elsewhere.[43]

It is particularly implausible that it should be so easy to hide away fissile material for a small arsenal of nuclear weapons. It might sound credible at first but not on further consideration. No government would store weapon-grade material "in a refrigerator" or "in a well" and leave it at that, as Schelling appears to insinuate.[44] Bomb-usable fissile material would be thoroughly guarded and fenced in order to prevent unauthorized actors from obtaining it. These security measures would have signatures that could be picked up by verification agencies who would enjoy greater authority and access rights than in the present world (because otherwise states would not lay down their nuclear arms). In order to ensure true reconstitution capabilities, governments would also have to maintain many technical experts who would have to practice their reconstitution job lest they risk failing in the hour of truth. Such clusters of expert people practicing their future breach of the rules in appropriate facilities would also leave a significant detectable signature. And that brings us back to the unrealistic assumptions—the verification system of a nuclear weapon-free world would be geared toward picking up such signatures in order to fulfill its early warning mission.[45]

As for the persistent high risk of great power war motivating the perpetual reliance on nuclear weapons, John Mueller, Richard Ned Lebow, and Steven Pinker have argued in book-length studies that the value of war for great powers is in decline, and for developed middle powers, war is already in disrepute.[46] Major wars might still be possible, but would be much more likely to occur between developing middle powers (such as the Iraq-Iran or the Ethiopia-Eritrea wars). The interest of the great powers, once they reach the level of very low nuclear numbers or even a final zero, would be to contain these wars and terminate them at an early point. The scenario envisioned by Schelling, then, is an out-of-the-blue catastrophe that has never had great plausibility or probability even though it informed paranoid war games on both the US and Soviet sides during the Cold War. It would be utterly implausible once nuclear arms have been abolished, because nuclear-armed nations would not have taken this step if the risk of major war still loomed large in their minds. The simple counter-factual operation Schelling undertakes to construct a nuclear weapon-free world compares unfavorably with the more complex and multi-faceted counterfactual construction presented here, even if that is still far from a complete forward—or backward—induced counterfactual method.

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Responsible or Irresponsible: Inconsistency in the Rationalist Assumptions

The nightmare scenario that Schelling unfolds then—a desperate race into nuclear preemption—should surprise no one, given this assumption. Nevertheless, it is unconvincing. As he insists, "responsible" governments have to take a cautionary approach toward security in that world. They have to mistrust their peers and, for that reason, take a prudential attitude toward the complete elimination of their reconstitution capabilities (it is important to note that this reliance on prudence is essential for Schelling's deterrence theory to work): in case of a major conflict, they must keep the preconditions for prompt reconstitution of a military nuclear capability, including material, equipment, parts, technology, and manpower. From there, he develops a scenario in which the first state to acquire a few nuclear weapons would use them preemptively to ensure a monopoly and would then be in a position to erect a blackmail–based nuclear tyranny—not a prospect anyone would welcome with enthusiasm; here I agree with him.

However, a "responsible" government would also anticipate that other governments in a position to do so would pursue similar policies. Schelling dismisses the possibility to establish a complete inventory of relevant materials and sites for all nuclear weapon-capable powers. At the same time, he predicts that national intelligence services would be tasked to identify all relevant sites in potentially hostile states, which is the only circumstance under which a "responsible government" could ever consider a disarming first strike. It is not explained how secret services, which do not enjoy the access privileges of an international inspectorate, would do better than inspectors in uncovering everything that a state tries to hide. A state that has successfully reconstituted a small nuclear arsenal thus could never be confident in his agents' omniscience concerning enemies' capabilities. With the failure of US intelligence to identify India's preparations for a nuclear test in 1998, or the botched reporting of Iraq's nuclear activities in 2003 (or lack thereof), which "responsible" leader would ever trust so completely in their spies? The leader—if he or she was both rational and responsible, as Schelling presumes—would have to assume that others may be as quick if not quicker than their own state in the reconstitution race. A government participating in such a race must thus assume that, while it might be possible that its state was the first to succeed, this is by no means ensured. It would be possible as well that others had also procured a few nuclear weapons that they had not employed and would not employ prematurely. Not using one's few nuclear weapons prematurely would be prudentially justified for two reasons: first, since the probability of eliminating all the enemy's nuclear assets would never be one (owing to a failure of the attack or the failure of intelligence to uncover all relevant sites on the enemy's territory), a nuclear attack might trigger nuclear retaliation and thus the worst case. Second, because the state breaching the nuclear taboo might be seen as rogue—and a significant future threat—by other parties not involved in the war in question, a nuclear first strike might provoke the formation of a hostile alliance determined to destroy the rogue threat before it becomes overwhelming. Together, these two considerations make it likely that a rational ("responsible") government would abstain from attacking first with nuclear weapons. Once we assume prudence guides governmental decisions, the idea of a disarming first strike in a reconstitution race can be ruled out.

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Even if we accept for a moment that a reconstitution race—including a drive toward preemption—might be irresistible (and I will explain shortly why it is not), the rational way of preemption would be with conventional weapons. An enemy posture of a few nuclear weapons, hastily assembled and mated to delivery vehicles capable of carrying them, might indeed be thought to be vulnerable; likewise, decapitation of a powerful enemy might look attractive—let us buy the argument for the sake of it. But the instrument of choice would have to be conventional weapons—conventionally-armed intercontinental ballistic missiles, submarine-launched ballistic missiles, cruise missiles, and long-range nuclear-capable bombers. They might do the job without precipitating nuclear retaliation, and one's own limited nuclear assets could be held back for intra-war deterrence against the enemy's crossing of the nuclear threshold. In addition, the attacking state would not acquire the opprobrium of being the first to breach the "nuclear taboo" in place since Nagasaki.

Conventional preemption in a reconstitution race is also not a future to celebrate. A major war with an early, horrible exchange of conventional ordinance is not what developed societies need. It is also not what governments of developed societies want. Since the vast majority of the states that could clash in the way Schelling hypothesizes consists of developed societies (and China and India may be there once nuclear disarmament happens), a war would thus bring a very unwanted result early on. Responsible governments applying prudential calculations and projections would develop a clear idea of this most likely scenario and feel compelled to avoid it. They would also know that the Damocles sword of "something left to chance," which Schelling (picking up legendary British admiral Horatio Nelson's quote) had so aptly depicted as the essence of nuclear deterrence, would fully apply in this situation.[47] I submit that the double expectation of a high probability of outrageous conventional devastation, combined with an above zero probability of unwanted nuclear escalation, would serve as a mighty deterrent against starting a war and as a powerful incentive to take all possible preventive diplomatic measures to avoid war in the first place. One may remark that the specter of unwanted nuclear war would then still hang over the world, and this is true when one accepts this whole scenario; but this situation is not largely different from today. If one believes in a world in which nothing has changed but the physical existence of nuclear weapons, deterrence would still hold in a similar way it holds today, with the same risk of an above zero probability that it might fail. It is not logically consistent to believe in the stability of the present world of nuclear deterrence and to deny it to the future world in which deterrence, including its nuclear aspect, would be present in a different form but the same substance. But this means that, contrary to Schelling's somber predictions, the world would not be worse off than today.

Framing the Record: Four Empirical Objections

Schelling's arguments contain four empirical claims that are not tenable: his account of wars among nuclear powers is incomplete; his denial of a present-day nuclear arms race is ill-informed; his negation of the influence current nuclear arsenals have on the motivation

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of proliferators overlooks contrary evidence; and his assessment of the disarmament discourse is heavily biased.

Wars Involving Nuclear Powers

Schelling provides a list of eight wars in the last sixty years in which one of the parties was a nuclear weapon state.[48] The list is significantly incomplete. There was the war between Israel and Lebanon/Hezbollah and Syria in 1982 (important, as it pitted a nuclear-armed state against a chemically-armed state), two wars between China and Vietnam (1979 and 1987), and a war in which both parties had nuclear weapons (India-Pakistan in 1999). The latter is particularly relevant: a shooting war with a strategically important prize (the strategic road through northern Kashmir that would connect Pakistan with China) should not occur, according Cold War-informed deterrence theory. Even more important, the one war which comes closest to being a template for Schelling's scenario (war between "latent nuclear powers" in a world without nuclear weapons) is not mentioned: the war between Iran and Iraq in the 1980s. Both Iran and Iraq had incipient nuclear technology capabilities at the outset of the war. The Shah of Iran, Mohammad Reza Pahlavi, left behind a broad nuclear research program established with the goal of developing a military nuclear option if and when necessary; Iraq had launched its own nuclear program centered on the Osirak reactor, which was destroyed by an Israeli air strike in 1981. The war between Iran and Iraq was long, cruel, and bitter. Both re-started nuclear activities during the fighting. But neither embarked on a crash program as should be expected on the basis of Schelling's projections for a nuclear weapon-free world. Even after being repeatedly attacked with chemical weapons, Iran did not race toward acquiring a nuclear capability. The pace of the program was slow and investment was limited; it was not a top priority.[49] This alone should be motivation enough to reconsider Schelling's scenario.

No Nuclear Arms Race

Schelling states that today no nuclear arms race is "in the offing."[50] It might not be "in the offing," but the precursor elements are present and it is difficult to understand how they can be overlooked.[51] US plans and activities for national and regional missile defenses, together with US superiority in long-range strike options, are creating worries in Russia and China about the survivability of their second-strike forces. Consequently, Russia is modernizing its arsenal even as its overall size decreases, seeking to introduce a new, more capable multiple warhead missile with increasing evasion and deception capabilities. China is slowly but steadily enhancing its small nuclear arsenal. In turn, India is deploying nuclear weapons on air-, land-, and sea-based platforms and has not put a cap on the growth of its own arsenal as long as China's is increasing. Pakistan does not want to fall behind and is pursuing weapon-grade plutonium production to complement its use of highly enriched uranium. Islamabad has also blocked any negotiations on a fissile material cut-off treaty at the Conference on Disarmament in Geneva in order to avoid pressure to halt production. The whole process is deeply worrisome, given that we know little about the dynamics of multipolar nuclear arms races and even less about how to stop them. This

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does not obviate, for the time being, further quantitative reductions of US and Russian warheads, but is far from the "nuclear quiet" which Schelling claims with a view to contrast the status quo positively against the horrors of a world without nuclear weapons.

No Impact of Existing Nuclear Arsenals on Proliferators

Schelling accepts the well-known position that the nuclear arsenals of the "official" nuclear weapon states (those recognized as such by the Treaty on the Non-Proliferation on Nuclear Weapons) have nothing to do with those of "rogues" like North Korea or Iran. But the security motivations for the North Korean and Iranian nuclear programs center on a confrontation with the United States, which is both conventionally superior and nuclear armed. The threat emerging from the United States as a conventional power can hardly be disentangled from its nuclear capability. North Korea has been target of nuclear threats during the Korean War, by Presidential Decision Directive 60 in 1997, and by its inclusion in the "axis of evil" in 2002.[52] Iran has shared the latter fate. As for the "status" motive of the two states, this would diminish if nuclear weapons were devaluated as symbols of standing in the process of disarmament. Instead, they are embraced (notably by Russia, France, and the United Kingdom), enhancing their political value for status-conscious elites in Tehran and Pyongyang. And, as argued above, sharp reductions in all presently existing arsenals would create a much more urgent joint interest of the established nuclear weapon states to prevent others from joining their club. Pressure on both Tehran and Pyongyang would consequently increase, and the prospects of dissuading them from further pursuing their present course might thus rise.

The Nuclear Disarmament Discourse

Schelling complains about the lack of defense of the status against the disarmament juggernaut and quotes two lonely "exceptions." This is an amazing under-representation of the pro-nuclear deterrence literature: There is, inter alia, an entire special issue of *International Affairs* in which a crowd of pro-nuclear pundits beats up a lone moderate defender of nuclear disarmament, William Walker.[53] There is former Secretary of Defense Harold Brown's 2007 article in the *Washington Quarterly*.[54] There are the widely read, witty, and well-written blogs of former US Special Representative for Nuclear Nonproliferation Christopher Ford.[55] There is NATO Energy Security Section head Michael Rühle's polemical book (in German) against nuclear disarmament, and Bruno Tertrais's (senior research fellow at the Fondation pour la Recherche Stratégique) treatise in defense of deterrence (in English and French), to name a few.[56] On the other hand, Schelling's proposition that serious disarmament discourse started only in 2007 with the *Wall Street Journal* op-ed by George Shultz, William Perry, Henry Kissinger, and Sam Nunn is mistaken. The 1990s and early 2000s witnessed multiple proposals in this direction, from the Stockholm International Peace Research Institute's project "Security without Nuclear Weapons," to the reports and studies of the Canberra Commission, and the ones of the Weapons of Mass Destruction Commission. Contributors to the debate—in addition to people Schelling would possibly condemn as "not serious" like me—also encompassed "serious" people

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such as General Charles Horner, the former commander of allied air forces during the Gulf War, General Lee Butler, the former commander of the Strategic Air Command, and General Andrew Goodpaster, the former NATO supreme allied commander Europe, together with former French Prime Minister Michel Rocard.[57] Seen in this light, the 2007 op-ed by the "four horsemen" elevated a longstanding debate to a new level, thanks to the high political rank and bipartisan distinction of the four elder statesmen. And there is no denying that their call was an important factor in President Barack Obama's decision to make nuclear disarmament a centerpiece of his foreign policy.

In sum, Schelling's comments on the empirical world overrate the risks existing in a nuclear weapon-free world, understate the risks of a new arms race and the impact current nuclear arsenals might have on proliferation, and overlook the continuity, depth, and breadth of the disarmament discourse, including serious work on how nuclear disarmament might be achieved, as well as the operational and practical aspects of eliminating nuclear weapons. All these omissions make nuclear disarmament appear more difficult and improbable than it may actually be.

Conclusion

The basic flaw in Schelling's argument is the misrepresentation of nuclear disarmament as a jump from today's world to a very similar, but nuclear weapon-free one, one where the future will resemble the past. But nuclear disarmament—if it occurs—can only develop as a slow and incremental process that combines various measures related to nuclear weapons with changes in conventional postures, arms control practices, and broader political relations and their institutional and normative anchoring. The basic flaw in Waltz's position is also the proposition that the future will emulate the past. In either case, the notion of change, which has been much more the pattern of history than stasis—in the sense of stagnation and sameness, not in the sense of civil war—is largely absent.[58]

This distortion of the temporal has a strong epistemological aspect. Schelling assumes that the way in which a future generation will perceive nuclear weapons and the international context in which they are embedded cannot deviate from the perceptions of today. Perceptions are thus divorced from the context in which they emerge and become naturalized—an epistemologically impossible operation. In Waltz's case, we have a kind of inverse constructivism: Waltz sees the future determined by our experiences with the past. But because "the past" is just what we perceive and interpret it to be, his inference assumes that the future is determined by our perceptions of the past—a daring proposition which not even very committed constructivists would adopt without hesitation. In either case, the deterrence effect of nuclear weapons is removed from the social context in which these weapons are embedded and treated as if it is a physical attribute. As Anne Harrington de Santana at the James Martin Center for Nonproliferation Studies has remarked, this is a classical process of "fetishization."[59]

Eventually, both Waltz and Schelling pronounce beliefs that are as foundational as those informing religions or ideologies. This is not necessarily their exclusive problem; most theories rest on assumptions that eventually rest on axioms that amount to beliefs. In the social sciences, ultimate verification of a hypothesis is not possible; one can only provide

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more or less plausibility that one belief might be more useful than another. The problem is that Waltz and Schelling use evidence in a way that tilts toward confirming what they believe, as their beliefs and the concepts related to them shape their perception and evaluation of empirical evidence. The mechanisms of cognitive consonance are at work: incoming information is filtered out or reframed in order to fit the pre-existing cognitive scheme which, in turn, is informed by the worldview to which the individual is committed.[60]

On the practical side, the common denominator—despite this divergence on proliferation—is the rejection of nuclear disarmament as a final objective, or, in philosopher Immanuel Kant's words, a "regulative idea." Waltz did not address nuclear disarmament in his *Foreign Affairs* article, but he strongly rejected the concept in his debate with Scott Sagan.[61] Schelling elaborates the complementary proposition that nuclear disarmament is definitely the less secure system, and Waltz agrees as well.[62] Neither makes a convincing argument for these conclusions because of the epistemological, logical incoherence, and empirical problems discussed extensively above.

This analysis started with the premise of taking Waltz's and Schelling's epistemological (positivism) and ontological (individualist rationalism) assumptions at face value, contrary to their more radical (postmodernist) critics. In the end, however, my critique converged in surprising ways with the one by these critics: by using the past (as they perceive it) as a firm ground to project, unconditionally on context, an identical (or nearly identical) future, they go beyond what we can know about the future based on the past. This violation of conventional inference rules for producing knowledge—that is, an epistemologically prohibited operation if one takes positivism seriously—results in an unchangeable setting of a nuclear-armed world, that is, a fixated ontology.

The contradiction between the rationalism underlying the approaches of both authors and the violation of the prudential imperative for security seekers which they both commit (in other words, a contradiction in the rationalist ontology), results in the vindication of the current deterrence system as valid for the indefinite future. The highly contestable framing of empirics results in the "proof" that the results of the epistemological and ontological mistakes are factually true and normatively right. This is as much as postmodernist critics have said from their extrinsic critical perspective, and this is where I, to my surprise, arrive from an immanent critical position as well.

To be sure, I understand that people might be skeptical whether a process of nuclear disarmament as briefly alluded to above would be possible and lead to its pronounced end state.[63] Personally, I believe in its *possibility* because nothing in the physical world stands in its way, and thus it is within our grasp. Measured optimism is not the least encouraged by the process that finished the Cold War, the ensuing relative devaluation of the role of nuclear weapons in Western national security policies, nuclear reductions and further measures in the US-Russian relationship, and the long-term trend in the reduction of interstate war. However, I am far from *certain* that the process will eventually reach its desired end. To predict that outcome would be to fall in the Waltzian trap of alleged certainties, only on the other side of the fence. Nevertheless, even if it does not, there will be achievements on the road that would be worthwhile having in order to enhance international security. The pivotal task for today is thus to think through this process and the steps it entails, rather than to invent far-fetched and methodologically

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questionable scenarios that have little relevance other than to serve as the bogeyman to scare people away from even thinking about the possibility of a nuclear weapon-free world.

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NOTES

1. Kenneth N. Waltz, *The Spread of Nuclear Weapons: More May Be Better*, Adelphi Paper 171 (London: International Institute for Strategic Studies, 1981); Kenneth N. Waltz, "Why Iran Should Get the Bomb," *Foreign Affairs* 91 (July/August 2012), pp. 2–4; Thomas C. Schelling, "A World Without Nuclear Weapons?," *Daedalus* 4 (Fall 2009), pp. 124–29.
2. Kenneth N. Waltz, *Theory of International Politics* (New York, NY: McGraw-Hill, 1979), p. 101.
3. Kenneth N. Waltz, "Waltz Replies," *Foreign Affairs* 91 (November/December 2012), pp. 161–62.
4. Keith Krause and Michael C. Williams, "From Strategy to Security: Foundations of Critical Security Studies," in Keith Krause and Michael C. Williams, eds., *Critical Security Studies: Concepts and Cases* (London: UCL Press, 1997), pp. 33–61, especially p. 42.
5. Ken Booth, *Theory of World Security* (Cambridge: Cambridge University Press, 2007), pp. 31–36.
6. Richard Ned Lebow, *A Cultural Theory of International Relations* (Cambridge: Cambridge University Press, 2008), pp. 43–60.
7. Alexander Wendt, *Social Theory of International Relations* (Cambridge: Cambridge University Press, 1999), p. 17.
8. Richard Ashley, "The Poverty of Neorealism," in Robert O. Keohane, ed., *Neorealism and its Critics* (New York: Columbia University Press, 1986), pp. 225–300; see also Richard Ned Lebow, *The Tragic Vision of Politics: Ethics, Interests and Orders* (Cambridge: Cambridge University Press, 2003), p. 385.
9. For example, Waltz, "The Spread of Nuclear Weapons," pp. 7, 9, 24.
10. Waltz, "Why Iran Should Get the Bomb," p. 5
11. Waltz uses the same language of unconditional assertions in his debate with Scott Sagan. See Scott Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons. An Enduring Debate*, Third Edition (New York/London: W. W. Norton & Company, 2012).
12. David Hume, *An Inquiry Concerning Human Understanding* (London: Liberal Arts Press, 1955).
13. Carl Lundgren, "What Are the Odds? Assessing the Probability of Nuclear War," *Nonproliferation Review* 20 (July 2013), pp. 361–74.
14. Kenneth N. Waltz, *Theory of International Politics* (New York: Random House, 1979), pp. 76–78, 89–93, 105–08, 110.
15. Alexander Wendt, *Social Theory of International Relations* (Cambridge: Cambridge University Press, 1999), pp. 15–16.
16. For risk analysis, see Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux, 2011). For the issue of insurance analysis, see Peter Zweifel and Roland Eisen, *Insurance Economics* (Heidelberg, New York: Springer, 2012).
17. International Atomic Energy Agency, "International Conventions and Legal Agreements—Vienna Convention on Civil Liability for Nuclear Damage," November 15, 2012, <www.iaea.org/Publications/Documents/Conventions/liability.html>.
18. A useful risk analysis critique is available by M. V. Ramana, "Beyond our imagination: Fukushima and the problem of assessing risk," *Bulletin of the Atomic Scientists*, April 2011, <http://thebulletin.org/web-edition/features/beyond-our-imagination-fukushima-and-the-problem-of-assessing-risk>. See also

John Downer, "Disowning Fukushima: Managing the Credibility of Nuclear Reliability Assessment in the Wake of Disaster," *Regulation & Governance* (July 2013), <http://onlinelibrary.wiley.com/doi/10.1111/rego.12029/abstract>.

19. Ibid.
20. See Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven, Connecticut: Yale University Press, 1983); Bruce G. Blair, *Strategic Command and Control: Redefining the Nuclear Threat* (Washington, DC: Brookings Institution, 1985); Richard Ned Lebow, *Nuclear Crisis Management: A Dangerous Illusion* (Ithaca, NY: Cornell University Press, 1987); Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993).
21. Paul Bracken has discussed this problem as a cause for deterrence failure. See Bracken, *The Command and Control of Nuclear Forces*, pp. 59–65.
22. Carl von Clausewitz, *On War* [edited and translated by Michael Howard and Peter Paret] (Princeton: Princeton University Press, 1976), Chapter 1.
23. I borrow this expression from one of the reviewers of an earlier version of this article.
24. For the number of 15,000 global reactor years, see M.V. Ramana, "Beyond our Imagination."
25. Colin H. Kahl, "One Step Too Far," *Foreign Affairs* 91 (November-December 2012), pp. 157–61.
26. On the Cuban Missile Crisis, see Alexander L. George, "The Cuban Missile Crisis," in Alexander L. George ed., *Avoiding War: Problems of Crisis Management* (Boulder CO: Westview Press, 1991), pp. 222–68. See also Richard Ned Lebow and Janice Gross Stein, *We All Lost the Cold War* (Princeton, NJ: Princeton University Press, 1994), pp. 110–45. On the 1983 Able Archer incident, see Peter Vincent Pry, *War Scare: Russia and America on the Nuclear Brink* (Westport, Connecticut: Greenwood Publishing Group, 1999), as well as National Security Archive, "The 1983 Cold War Scare: 'The Last Paroxysm' of the Cold War, Part I,' National Security Archive Electronic Briefing Book No. 426, May 16, 2013, <www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB426/>; National Security Archive, "The 1983 Cold War Scare: 'The Last Paroxysm' of the Cold War, Part II," National Security Archive Electronic Briefing Book No. 427, May 21, 2013 <www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB427/>; and National Security Archive, "The 1983 Cold War Scare: 'The Last Paroxysm' of the Cold War, Part III," National Security Archive Electronic Briefing Book No. 428, May 22, 2013, <www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB428/>. Some would probably add the 1973 Yom Kippur War crisis, but it appears to me that the mutual nuclear signaling during this period was very tightly controlled.
27. See Waltz, "Waltz Replies."
28. Thérèse Delpech, *Nuclear Deterrence in the 21st Century: Lessons from the Cold War for a New Era of Strategic Piracy* (Santa Monica: RAND Corporation, 2012), pp. 79–80.
29. See Waltz, "Waltz Replies."
30. A concise account of the episode and a crisp overview of the related literature can be found in Jeffrey W. Knopf, "The Concept of Nuclear Learning," *Nonproliferation Review* 19 (Spring 2012), pp. 79–93, and Sagan and Waltz, *The Spread of Nuclear Weapons. An Enduring Debate*, pp. 142–48.
31. Glenn H. Snyder, "The Balance of Power and the Balance of Terror," in Paul Seabury ed., *The Balance of Power* (Scranton: Chandler, 1965), pp. 185–201. The paradox was applied to the Kargil war, inter alia, by S. Paul Kapur, "India and Pakistan's Unstable Peace: Why Nuclear South Asia is Not Like Cold War Europe," *International Security* 30 (Fall 2005), pp. 127–52, and Michael Krepon, *The Stability-Instability Paradox, Misperception, and Escalation Control in South Asia* (Washington: Stimson Center, 2003), <www.stimson.org/images/uploads/research-pdfs/ESCCONTROLCHAPTER1.pdf>.
32. These are the reasons why Rajesh Ragajopalan denies the applicability of the paradox to the Kargil war, see Rajesh Rajagopalan, "What Stability-Instability Paradox? Subnational Conflicts and the Nuclear Risk in South Asia," Bradford, South Asian Strategic Stability Unit, SASSU Research Paper No. 4, February 2006, <www.sassi.org/wp-content/uploads/2012/05/RP-4_Rajesh-Rajagopalan-What-Stability-Instability-Paradox-Feb-2006.pdf>.
33. Sagan and Waltz, *The Spread of Nuclear Weapons: An Enduring Debate*, pp. 157–71.
34. In this and the following paragraphs, I pick up some of the observations by Kahl, "One Step Too Far."
35. The Israeli doctrine and its historical, psychological, and political background is analyzed by Zeev Maoz, *Defending the Holy Land: A Critical Analysis of Israel's Security and Foreign Policy* (Ann Arbor: University of Michigan Press, 2006).

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36. For a well-balanced Israeli critique of Waltz and an assessment of the consequences of a nuclear-armed Iran for Israel and the region, see Emily Landau, "When Neorealism Meets the Middle East: Iran's Pursuit of Nuclear Weapons in (Regional) Context," *Strategic Assessment* 15 (October 2012), pp. 27–38.
37. Colin Kahl makes these points in his reply to Waltz in Kahl, "One Step Too Far."
38. Sagan and Waltz, *The Spread of Nuclear Weapons: An Enduring Debate*, p. 194.
39. Most useful insights into the internal fabric of Iran's state and society are Rouzbeh Parsi, ed., *Iran: A Revolutionary Republic in Transition* (Paris: Institute for Security Studies, 2012); Majd Hooman, *The Ayatollahs' Democracy: An Iranian Challenge* (New York: W. W. Norton & Company, 2010).
40. Unlike most other state governments, the Third Reich was *sui generis*: a regime not dedicated to state survival but to dominance based on a racist ideology of "Aryan supremacy," blind toward the balance of forces which its own acts brought together into an alliance that would defeat Germany, and oblivious of the immense loss of (war-essential) "human capital" entailed by the Jewish genocide and the expulsion of many high quality scientists, including some who joined the Manhattan project. Examples are Colin S. Gray, *Nuclear Strategy and National Style* (Lanham, MD: Hamilton Press, 1986); Peter Katzenstein, ed., *The Culture of National Security: Norms and Identity in World Politics* (New York: Columbia University Press, 1996); Itty Abraham, ed., *South Asian Cultures of the Bomb: Atomic Publics and the State in India and Pakistan* (Bloomington, Indiana University Press, 2009); and Tanya Ogilvie-White and David Santoro, eds., *Slaying the Nuclear Dragon: Disarmament Dynamics in the Twenty-First Century* (Athens: University of Georgia Press, 2012).
41. Counterfactual analysis has been largely applied with regard to the empirical analysis of the past. For example, see Richard Ned Lebow, *Forbidden Fruit: Counterfactuals and International Relations* (Princeton, NJ: Princeton University Press, 2010); Giovanni Capoccia and R. Daniel Kelemen, "The Study of Critical Junctures Theory, Narrative, and Counterfactuals in Historical Institutionalism," in *World Politics* 59 (April 2007), pp. 341–69; Philip E. Tetlock and Aaron Belkin, eds., *Counterfactual Thought Experiments in World Politics: Logical, Methodological, and Psychological Perspectives* (Princeton: Princeton University Press, 1996); Davis Sylvan and Stephen Majeski, "A Methodology for the Study of Historical Counterfactuals," *International Studies Quarterly* 42 (1998), pp. 79–108; James D. Fearon, "Counterfactuals and Hypothesis Testing in Political Science," *World Politics* 43 (January 1991), pp. 169–95. But it is worthwhile noting that when we try to develop well-founded assessments of the future (like in prognoses or scenario analysis), we are working with counterfactuals as well and should do so methodologically. See Steven Weber, "Counterfactuals, Past and Future," in Tetlock and Belkin, *Counterfactual Thought Experiments*, pp. 268–88.
42. This is a famous expression of Schelling's deterrence theory. It is because of the inherent uncertainties of crisis interaction between two nuclear-armed states that their governments will work to avoid, or at least to early terminate, such crises in the first place
43. Harald Müller, "Enforcement of the Rules in a Nuclear Weapon-Free World," in Corey Hinderstein, ed., *Cultivating Confidence: Verification, Monitoring, and Enforcement for a World Free of Nuclear Weapons* (Washington, DC: Nuclear Threat Initiative, 2010), pp. 33–66.
44. Schelling, "A World Without Nuclear Weapons?," p. 126.
45. There is a growing literature about such steps, and about elements granting security in a nuclear weapon-free world. For a few examples, see Catherine M. Kelleher and Judith Reppy, eds., *Getting to Zero: The Path to Nuclear Disarmament* (Stanford, CA: Stanford University Press, 2011); Hinderstein, ed., *Cultivating Confidence*; Barry M. Blechman and Alexander K. Bollfrass, eds., *Elements of a Nuclear Disarmament Treaty: Unblocking the Road to Zero* (Washington, DC: Henry L. Stimson Center, 2010); George Perkovich and James M. Acton, *Abolishing Nuclear Weapons: A Debate* (Washington, DC: Carnegie Endowment for International Peace, 2009); George Perkovich and James M. Acton, *Abolishing Nuclear Weapons*, Adelphi Paper 396 (London: Routledge, 2008); The Weapons of Mass Destruction Commission, *Weapons of Terror: Freeing the World of Nuclear, Biological and Chemical Arms* (Stockholm: WMDC, 2006).
46. John E. Mueller, *Retreat from Doomsday: The Obsolescence of Major War* (New York: Basic Books, 1989). Richard Ned Lebow, *Why Nations Fight* (Cambridge: Cambridge University Press, 2010), especially pp. 197–223. See also Steven Pinker, *The Better Angels of Our Nature: Why Violence Has Declined* (New York: Viking, 2011).

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47. Thomas C. Schelling, *The Strategy of Conflict* (Cambridge, Massachusetts, London: Harvard University Press, 1980), pp. 187–203; see also Thomas C. Schelling, *Arms and Influence* (New Haven, London: Yale University Press, 1965), pp. 92–125.
48. Schelling, "A World Without Nuclear Weapons?," pp. 128–29.
49. Jacques E. C. Hymans, *Achieving Nuclear Ambitions: Scientists, Politicians and Proliferation* (Cambridge, UK: Cambridge University Press, 2012), pp. 79–123, 255–59.
50. Schelling, "A World Without Nuclear Weapons?," p. 129.
51. Shannon N. Kile with Vitaly Fedchenko, Phillip Schell, Hans M. Kristensen, Alexander Glaser, and Zia Mian, "World Nuclear Forces," in Stockholm International Peace Research Institute ed., *SIPRI Yearbook 2012* (Oxford: Oxford University Press, 2012), pp. 307–50; Delpech, *Nuclear Deterrence in the 21st Century*, pp. 115–40; Delpech underrates the role of the United States in this race, but establishes convincingly that it is under way.
52. Arms Control Association, "Clinton Issues New Guidelines on U.S. Nuclear Weapons Doctrine," November 15, 2012, <http://www.armscontrol.org/act/1997_11–12/pdd>.
53. *International Affairs* 83 (May 2007), pp. 427–574.
54. Harold Brown, "New Nuclear Realities," *Washington Quarterly* 31 (Winter 2007–08), pp. 7–22.
55. See "New Paradigms Forum," <www.newparadigmsforum.com/NPFtestsite/>.
56. Michael Rühle, *Gute und Schlechte Atombomben* [*Good and Bad Atomic Bombs*], (Hamburg: Körber-Stiftung, 2009). See also Bruno Tertrais, *In Defense of Deterrence: The Relevance, Morality and Cost-effectiveness of Nuclear Weapons* (Paris: IFRI Security Studies Department, 2011), p. 39.
57. General Goodpaster was chairman of a nuclear abolition project run by the Atlantic Council. See Andrew J. Goodpaster, *An American Legacy: Building a Nuclear-Weapon-Free World* (The Final Report of the Steering Committee of the Project on Eliminating Weapons of Mass Destructions), (Washington, DC: The Henry L. Stimson Center, 1997). For analyses and proposals, see Regina Cowen Karp, ed., *Security Without Nuclear Weapons? Different Perspectives on Non-Nuclear Security* (Oxford, UK: Oxford University Press, 1992); The Canberra Commission of the Elimination of Nuclear Weapons, "Statement," July 2, 1998, <www.ccnr.org/canberra.html>; Weapons of Mass Destruction Commission, "The WMDC Concludes Its Collective Work," November 15, 2012, <www.un.org/disarmament/education/wmdcommission>.
58. Lebow, *A Cultural Theory of International Relations*, pp. 505–06, 567–70.
59. Anne Harrington de Santana, "Nuclear Weapons as the Currency of Force: Deconstructing the Fetishism of Force," in *Nonproliferation Review* 16 (November 2009), pp. 325–45.
60. Robert Jervis, *Perception and Misperception in International Politics* (Princeton: Princeton University Press, 1976), pp. 382–406. For Waltz, this was already tangible in the defense of his beliefs against the strong evidence accumulated by Scott Sagan in the three debates the two scholars conducted, see Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton & Company, 1995); Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate Renewed* (New York: W. W. Norton & Company, 2003); and Sagan and Waltz, *The Spread of Nuclear Weapons: An Enduring Debate*.
61. Sagan and Waltz, *The Spread of Nuclear Weapons: An Enduring Debate*, pp. 220–24.
62. Ibid, p. 223.
63. Like Waltz in his discussion of President Obama's policy, see Sagan and Waltz, *The Spread of Nuclear Weapons: An Enduring Debate*, pp. 221–24.

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