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Winning with the Bomb

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Nuclear weapons' effects on an actor's success in coercive diplomacy are in part a function of how nuclear weapons change the perceived costs of conflict. The authors argue that states can improve their allotment of a good or convince an opponent to back down and have shorter crises if their opponents have greater expected costs of crisis. Noting that nuclear weapons increase the costs of full-escalation scenarios but decrease their probability, it is uncertain what impact nuclear weapons should have on expected costs of conflict. The authors assess crisis outcomes from 1945 to 2000 using the International Crisis Behavior data set. The evidence confirms that nuclear actors are more likely to prevail when facing a nonnuclear state. The expected duration of crisis in such asymmetric directed dyads is substantially smaller than the duration of crisis for actors in nonnuclear dyads. Nuclear actors in asymmetric dyads are also more likely to prevail than states in symmetric nuclear dyads.

Keywords: *nuclear weapons; victory; international crisis behavior*

Nuclear weapons are destructive instruments created to coerce other states. Indeed, the Manhattan Project was launched, in part, out of fear that Hitler would develop the bomb first en route to global domination, and the first uses of atomic weapons in combat were attempts to precipitate a Japanese surrender. States endure considerable risks and costs to develop nuclear weapons, presumably to enhance their bargaining leverage toward getting a larger share of the global resource pie, or, at a minimum, to better holding onto the resources already possessed.

Use of atomic weapons, however, has not been attempted since 1945, and they are rarely explicitly threatened (Betts 1987). Whether they can be credibly threatened as coercive devices remains in question because the potential costs to the user are prodigious, especially against another nuclear state. A substantial literature exists attempting to explain how nuclear weapons can be useful for coercive diplomacy in light of such credibility issues (e.g., Schelling 1966; Powell 1987, 1988, 1990; Snyder and Diesing 1977). Such studies tend to explain only how nuclear weapons

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can be used in deterrence, with the ability to compel left in doubt. Zagare and Kilgour (2000) have also pointedly observed that much of this "classical deterrence" literature uses irrational constructs to explain how rational actors threaten higher risk of escalation to make a foe to back down.

In line with an overarching argument of this issue (Gartzke and Kroenig 2009, this issue), this article considers whether nuclear proliferators actually reap benefits from their weapons. We specifically address whether nuclear states are better able to succeed in crisis bargaining. While there has been a great deal of attention to conflict initiation in the international-relations literature, scholars less often focus on the bargained outcomes of conflicts (Werner 1998, 322). Some researchers have suggested that capability distribution is a key causal factor in determining who wins (Desch 2002), while others point out the importance of strategic choices (Arreguín-Toft 2005; Gartner and Siverson 1996) or domestic politics (Reiter and Stam 2002). Others have suggested that the political outcomes are a product of original war aims (Werner 1998) or, similarly, the resolve of the sides and their willingness to suffer (Maoz 1983). Stam (1996) has integrated many of these approaches in the most comprehensive account thus far to reveal that both third-image and second-image characteristics can explain war outcomes. Gelpi and Griesdorf (2001) specifically assess international crises in their analysis of how domestic institutions affect the prospects for victory.

One issue that is generally missing from the literature on victory and failure in conflict is the impact of nuclear weapons. Stam (1996) predicts almost the same results for victory during the nuclear period as before, and Gelpi and Griesdorf (2001) include nuclear weapons as a control variable and demonstrate mixed findings about their effects. Other work suggests that nuclear weapons have an important impact on strategic interaction in conflicts and crises, as evident in assessments of direct deterrence (Geller 1990; Asal and Beardsley 2007; Rauchhaus 2009, this issue) and extended deterrence (Fearon 1994; Huth 1988, 1990; Huth and Russet 1988; Signorino and Tarar 2006). None of these studies systematically unpack how nuclear weapons affect an actor's ability to achieve better bargains. We are interested in how states benefit from the bomb even when they do not actually use it.

Theoretical Framework

The question of what effects nuclear weapons have on successful coercive diplomacy is in part a function of how nuclear weapons change an opponent's perceived crisis costs. Classical-deterrence theorists such as Schelling (1966), Snyder and Diesing (1977), Jervis (1989), Waltz (1990, 2003), Gaddis (1986), Intrilligator and Brito (1981, 1984), and Powell (1987, 1988, 1990), while disagreeing on other matters, tend to argue that the potential costs of nuclear attack are so great that restraint from opponents of nuclear states follows. Even Zagare and Kilgour (2000), using perfect-deterrence theory to demonstrate that nuclear weapons are probably not as stabilizing as the classical-deterrence scholars expect, contend that nuclear weapons have the potential to increase the costs of conflict of opponents and to enhance the success of nuclear states in coercive diplomacy.

We cannot, however, take as given that nuclear weapons actually increase the expected conflict costs of conflict. While this is something that has often been argued, there are few systematic empirical tests for whether the observed world conforms to what one would expect if nuclear weapons do increase costs of conflict. Some scholars discount the role that nuclear weapons have played in increasing an opponent's costs of conflict and stabilizing peace. Mueller (1988) has argued that nuclear weapons are actually irrelevant, as they can never credibly be threatened. Geller (1990) has also argued that nuclear weapons are generally irrelevant against nonnuclear actors and finds that nuclear-weapon states are unable to deter nonnuclear states from aggression. Proliferation pessimists such as Sagan (2003) argue that some decision makers, particularly military leaders, will not weigh the costs the same way as civilian leaders.

We argue that nuclear weapons could have two competing effects. When states face nuclear opponents, the cost of all-out, unrestrained war is certainly going to be prodigious. At the same time, the probability of such unrestricted war decreases when an actor faces a state with nuclear weapons. In this vein, Jervis (1989, 3) notes that difficulties in understanding the impact of nuclear weapons "stem in part from the fact that the trade-off between the chance of war and the consequences of war is an extremely painful one, the kind that people try to avoid facing." Without an *a priori* expectation of whether the costs of unlimited war change as much as the probability of such a war, there can be no strong expectation about whether opponents of nuclear-weapon states face higher expected costs in crisis than if they faced a nonnuclear state.

The puzzle thus becomes an empirical question of whether or not states behave as the expected costs are a function of the other side's nuclear capabilities. Since the analyst is not an omniscient observer, those expected costs cannot be directly measured. Instead, we derive some hypotheses that would be consistent with what should occur if the world were such that opponents of nuclear states faced higher expected costs of engaging in a crisis. As the expected costs of conflict rise, opponents of nuclear states will be more eager to settle and settle in as short a time as possible. By testing the hypotheses, an empirical analysis of international crisis behavior provides substantial support for the notion that states do indeed face higher expected costs when confronting a nuclear state.

Competing Effects of Nuclear Weapons

The approach here focuses on the expected costs of conflict, conceived as a weighted average of the costs of all the potential scenarios that could occur in conflict. Nuclear weapons influence those expected costs of conflict via both the costs of certain scenarios and the probability of those scenarios. The maximum-escalation scenarios in this setup should obviously entail enormous damage when involving a nuclear state.

While the costs of the maximum-escalation scenarios will increase in the shadow of nuclear weapons, the associated probabilities should decrease. The size of these weapons and their clumsy inability to not cause horrific damage even when used in a limited sense make them an unlikely option in war. Against a nuclear opponent, especially one with second-strike capabilities, the costs to the using state would likely be in the form of a catastrophic response. Such a threat of retaliation from a nuclear adversary is obvious, but there are also substantial costs to using nuclear weapons against a nonnuclear state. The use of nuclear weapons can hinder the using state from pursuing some of its strategic objectives, such as winning the support of an adversary's domestic population or even gaining control of a disputed area that becomes irradiated. Beyond these instrumental incentives, Tannenwald (1999, 2005) has traced the development of a nuclear taboo, in which there are substantial normative costs to a first-strike nuclear attack. Once the nuclear taboo is established, decision makers may never consider using a nuclear first strike because it simply always lies outside of the range of possible appropriate actions or they risk sanction from the greater international or domestic communities for violating a deeply rooted norm.

The probability of full escalation is lower in the shadow of nuclear weapons, but the costs are greater. The previous theoretical work on nuclear deterrence is ambiguous as to the rate of increase or decrease in the costs and probability of nuclear use. In Zagare and Kilgour's (2000) work on perfect-deterrence theory, they effectively show that deterrence success decreases with the credibility of a threat such as nuclear use but increases with the costs that it would impose on the other side. Because they have no prior assumptions about how nuclear weapons specifically affect their variables, Zagare and Kilgour are able to show only that nuclear deterrence *can* fail but not whether it fails more or less often than under conventional deterrence. This is the essence of the puzzle considered. Because of the competing effects on the costs and probabilities of full-escalation scenarios, nuclear weapons may not alter the expected costs of conflict.

If nuclear weapons were to increase the expected costs of conflict, what should we observe? While the impact of nuclear weapons on bargaining behavior has thus far been treated as an empirical question, we use the view that nuclear weapons do increase an opponent's expected crisis costs, consistent with Jervis (1989) and Waltz (2003), as the basis for postulating falsifiable hypotheses. If it is true that opponents of a nuclear state face higher expected costs of crisis, we should first observe that they are more willing to concede to the nuclear state's demands, or at least, back down from their own demands. We would expect nuclear states to realize divisions of the disputed goods that are higher than if they did not have nuclear weapons. The logic is that opponents facing higher costs of conflict will find more alternatives that are preferable to fighting—there is more room for concession and there is less incentive to push their own demands at risk of greater escalation.

The central argument is thus that we should observe nuclear-weapon states prevailing in their coercive diplomacy—where prevailing is defined as either gaining concessions or having an opponent back down from its demands—if the weapons actually increase the expected costs of an opponent's crisis. The reasoning is necessarily a bit complicated because concessions are defined relative to the status quo, and the argument has not made any assumptions about the positioning of the status quo. From a purely probabilistic standpoint, however, we posit that as an actor's costs of conflict increase, there is a higher probability that a given outcome that gives the actor less than the status quo will be preferable to fighting. So, when an actor finds more concessionary outcomes preferable to war, the probability, by no means a guarantee, that those concessions are realized will increase. Achieving concessions, however, is not the only means for states to prevail in their crises. When the nuclear states are the status-quo actors that are satisfied and merely hoping to hold onto what they have, successful coercive diplomacy entails not making concessions. That is, if nuclear weapons increase an opponent's expected conflict costs, then nuclear states will face fewer challengers unwilling to back down because the challengers' expected outcomes from fighting will more rarely be superior to the status quo.

There are a number of caveats that should be considered when empirically testing this argument. First, since states expecting concessions should make greater demands, this necessitates that the operational definition of bargaining gains not be too contingent on the endogenous demands and goals. For example, a definition of victory that hinges on realizing the demands made will be problematic because nuclear states may demand more going into a crisis, which raises the bar of achieving victory. Second, we will need to be wary of self-selection bias because it is possible that opponents of nuclear states may concede more *before* a crisis, which leaves a special subset of opponents that are reluctant to concede as those that actually enter into a crisis. Related, those opponents of nuclear states demanding a change from the status quo might only make such demands if they are truly dissatisfied and resolved to not back down. The methods section describes how we account for such potential problems of endogenous demands and self-selection bias.

Hypothesis 1: Nuclear-weapon states are more likely to prevail in either gaining concessions or convincing an opponent to back down in their crises than are non–nuclear-weapon states.

Actors facing higher costs of engagement will not only want to concede *more*, but they will also want to concede *faster*. If nuclear weapons increase the costs of the full-escalation scenarios in each conflict period more than they decrease the probability of such scenarios, then opponents of nuclear states have a greater incentive to resolve the crisis sooner rather than later. Because of the per-period expected costs, opponents of nuclear states will be less willing to patiently wait for a better bargain. If the probability of nuclear use increases as a crisis endures and escalates, then the weapons' effects on the conflict costs will be especially pronounced at later escalation phases. Opponents of nuclear states will thus have incentives to exit their crises before the expected costs of conflict increase beyond acceptable levels.

Hypothesis 2: Opponents of nuclear-weapon states are more likely to end crises sooner than opponents of non-nuclear-weapon states.

Thus far, the discussion has centered on a nonnuclear opponent facing a nuclear state. While much of the previous literature has focused solely on the dynamics within symmetric nuclear dyads, we distinguish between nuclear and nonnuclear protagonists. When nuclear states square off against each other, extant research on nuclear deterrence suggests that the probability of full escalation should be at its lowest. That is, if mutually assured destruction adheres, then nuclear use becomes almost unthinkable for each side. While the probability of full escalation most closely approaches zero for actors in symmetric nuclear dyads, the costs of a full-escalation scenario to each side should be similar for both nuclear and nonnuclear actors facing a nuclear opponent. In both cases, full escalation entails mass devastation. Taking into account both the probability and costs of full escalation, the per-period *expected* costs of crisis will be lower for nuclear states facing a nuclear opponent than for nonnuclear states facing a nuclear opponent. The logic dictates that nuclear actors will fare better in their bargaining outcomes against nonnuclear states than against fellow members of the nuclear club.

Hypothesis 3: Nuclear-weapon states in symmetric dyads are less likely to prevail in their crises than those in asymmetric dyads.

Hypothesis 4: Opponents of nuclear-weapon states in symmetric dyads are less likely to end their crises sooner than those in asymmetric dyads.

One additional implication follows from the proposed logic. The actors themselves have control over the probability of each escalation scenario. Actors that go into a crisis, presumably over a lesser issue, with absolutely no intention of escalating past a certain point should not be expected to have a probability of full escalation greater than zero. Since states rarely threaten nuclear use, it would be a tenuous assertion to say that all crises involving nuclear actors have some lingering implicit threat. As a result, the effect of nuclear weapons should be contingent on the saliency of the crisis to the actors involved. In low-salient conflicts that an actor has no intention to escalate if needed, nuclear weapons should have no bearing. If nuclear weapons do have an impact on crisis outcomes, it will be in more salient crises in which the probability of full escalation is greater than zero—although still presumably small.

Hypothesis 5: Nuclear-weapon states will be more prone to prevail and to face shorter crises when saliency is high.

Analysis

To test these hypotheses, data are used from the International Crisis Behavior (ICB) data project in conjunction with numerous other sources of data detailed below. The appropriate level of analysis is the crisis actor, and since crisis actors often face multiple opponents, we use directed crisis dyads from 1945 to 2002. The dyads are directed in the sense that A's actions toward B are different from B's actions toward A. They are defined according to Hewitt (2003) and updated to be consistent with version 8 of the ICB data.[1] Brecher and Wilkenfeld (2000) define an ICB crisis as an interstate dispute that threatens at least one state's values, has a heightened probability of military escalation, and has a finite time frame for resolution. The benefit of using ICB crises is that they comprise a useful set of cases in which bargaining failure could occur and lead to escalation but is not a necessary condition.[2]

Dependent Variables

The two dependent variables from the hypotheses are an indicator of whether an actor prevails and the duration of the conflict. For the former, the framework defines crisis success as either gaining a better share of the bargain or convincing an opponent to back down. Two different measures are used to capture crisis victory. An existing ICB variable categorizes outcomes according to whether an actor was victorious in realizing all of its goals, reached a compromise to realize some of its crisis goals, or faced stalemate or defeat to not achieve any of its goals. For one dichotomous measure of crisis success, we use the first category of this existing variable, which follows Gelpi and Griesdorf (2001). States that avoid compromise, stalemate, or defeat are definitely victorious and successful in their crises.

We also use another measure of crisis success because we suspect that a crisis actor's goals are endogenous. If the expected costs felt by a crisis actor are greater when facing a nuclear state, then we should simply expect that the nuclear state would increase its demands and expectations of what it can get from the opponent. As a result, the bar would be higher for the nuclear actor to achieve all of its goals, so the probability of victory defined in this way might not change even if nuclear weapons do improve a state's bargaining position. In light of this potential problem, we adopt another measure that better accounts for endogenous demands because it is less restrictive on what prevailing in crisis entails. Clearly, an actor still prevails if it is coded as victorious, and it does not succeed if it only reaches a stalemate or fails in defeat. For those actors that reach a compromise, this could indicate a slightly better bargain, maintenance of the status quo, or a slightly worse bargain. To distinguish between these potential scenarios, we use another variable that codes the satisfaction of the crisis actors. We contend that if an actor reaches a compromise and expresses satisfaction with the outcome, this is an indication that the actor succeeded

Table 1
Dates of Weapon States

	Nuclear Weapons	
Country	Start	End
United States	1945	>2001
Soviet Union/Russia	1949	>2001
United Kingdom	1952	>2001
France	1960	>2001
China	1964	>2001
Israel	1967	>2001
India	1988	>2001
South Africa	1982	1990
Pakistan	1990	>2001
North Korea	>2001	>2001

in either gaining concessions or not acceding to an opponent's demands.[3] In sum, an actor is coded as winning in this second measure if it is victorious in achieving all of its goals or if it is demonstrably satisfied with a compromise.

Turning to the duration of conflict, the ICB data code a variable that counts the number of days between a crisis actor's trigger date and the actor's termination date. The first and last days of crisis are rarely the same for both actors in a dyad, as the crisis is usually perceived first by one actor, and the other actor only perceives a crisis after the first responds, usually days or weeks later. A directed-dyad approach remains valid because this outcome measure varies between the A to B and B to A directed dyads, although the analyses will take care to account for the interdependence of the AB and BA observations.

Independent Variables

Dichotomous indicators for whether each state in a directed dyad has nuclear weapons are included as the most important explanatory variables. Table 1 presents the dates used, which are consistent with the dates presented in the introduction to this issue (Gartzke and Kroenig 2009, this issue). Of the 1,218 crisis actors in these data, 221 (18 percent) have nuclear weapons.[4]

Degree of salience also plays an important role in the hypotheses. We measure salience using a dummy variable that combines two threat-severity indicators: the stakes involved and the presence of violence.[5] In terms of stakes, nuclear weapons will be most credible when addressing a clear security threat. The ICB data code the gravity of a crisis, and the highest two values for this variable—a threat of grave damage and a threat to existence—are the most clear indicators of a core value being threatened. So, one component of high salience in our coding scheme is thus whether the crisis obtains one of these two values. Having some minimal level of violence should also be required for a crisis to be salient and for nuclear weapons to have relevance. Violent crises are not limited probes that have no intention of escalating even a modest amount. The ICB data have a 4-point indicator of violence experienced in a crisis, and we only code crises as highly salient if there is some minimal level of violence. In sum, highly salient crises are those involving a severe threat, as defined by (1) gravity at least at the level of a threat of grave damage and (2) some minimal level of violence.[6]

The models implement a combination of control variables. One of the most frequently used variables in analyses of conflict outcomes is the balance of military capabilities within a dyad (see Stam 1996; Reiter and Stam 2002; Gelpi and Griesdorf 2001; Gartner and Siverson 1996). Actors with nuclear weapons are likely to have relatively large amounts of conventional capabilities, which may shape escalation behavior in ways that are independent of the possession of nuclear weapons. We include the ratio of the actor's level of capability (CINC) to the sum capability of the dyad from the Correlates of War National Military Capabilities 3.01 index (Singer, Bremer, and Stuckey 1972; Singer 1987).[7] Related, the models also control for whether an actor is a superpower. This variable is used to see if the results hold for all nuclear actors or just for the United States and the Soviet Union/Russia. There could be something distinctive about those two actors that would not be captured by simple measures of capability ratios.

Controlling for violence level is important, as the use of brute force by a nuclear state to attain victory is not the same as using tacit threats to achieve a desired outcome. By including violence in the models, the effects of nuclear status can be considered independently from the levels of violence used on the way to the ultimate outcome. Violence level is measured as a 4-point categorical variable from the ICB data.

As Jo and Gartzke (2007) contend, states choose to pursue nuclear weapons strategically.[8] Jo and Gartzke find that states with high levels of external threats are more likely to proliferate (see also Sagan 1997 and Singh and Way 2004). The presence of external threats might also dictate how well a state performs in its crises, as having previously unresolved issues indicates the tendency for crises to stalemate. Unless we control for a state's external security concerns, a nuclear-weapons variable may be picking up any correlation between rivalry and outcomes instead of the relationship between the weapons and the outcomes. As a result, we include a variable that, for each year, counts the number of preceding crises that a state has been in since 1918 and then averages over the years since 1918 or the state's entrance into the system.

Finally, we control for whether a state is a target of aggression. A distinction between compellence and deterrence is often made, often in respect to the balance of interests (Schelling 1966; Jervis 1989; Betts 1987). The argument is typically that actors will be better able to use nuclear coercive diplomacy in defense of a value or resource instead of in trying to acquire something from another actor. Controlling for whether a state is on the defensive resolves a restriction of the directed-dyad approach, in which both actors, regardless of who initiated the crisis, are assumed to have equal outcome tendencies. We define a targeted state in a dyad as an actor that perceived the crisis first and that perceived the other actor in the dyad as its primary source of threat, according to the ICB data.[9] The states in a dyad that perceive a crisis first are, by definition of a crisis, the first to perceive a threat and are thus considered to be targeted by the source of threat. Actors that experience a crisis later typically are experiencing the threat of a response.

Models

Estimation of the impact of nuclear weapons on bargaining outcomes and crisis duration requires two different classes of models. For the models of outcomes, we rely on probit models. For duration, the data are single-observation survival times, and we rely on Cox proportional-hazard estimation for many of our analyses because it does not assume a certain shape of the hazard function.[10]

The analyses are subject to potential selection bias, as states strategically select themselves in and out of crises, not wanting to fight when they are likely to lose. Taking selection effects seriously, we demonstrate robustness using simultaneous-equation estimation of the selection and outcome processes. In estimating the selection equation, the base set of cases is the set of dyad years, consistent with Rauchhaus (2009, this issue). For the models of bargaining outcomes, we use a censored probit model, which is a special case of a bivariate probit model and is often referred to as a "Heckman probit" model (see Dubin and Rivers 1989; Reed 2000). For the duration models, we use Boehmke's estimator to account for selection effects (Boehmke 2005; Boehmke, Morey, and Shannon 2006). The selection equation of each of these models includes the independent variables described above, a measure of contiguity and a measure of similarity of alliance portfolios, from the Eugene 3.1 software. Since the selection equations in these models involve binary longitudinal data with a probit link, we include time since the previous crisis among the dyadic actors, its square, and its cube to account for temporal dependence (Carter and Signorino 2007; Beck, Katz, and Tucker 1998).

While we demonstrate robustness with the selection models, we rely on the more conventional models for our interpretations of the magnitudes of the effects. Any lingering concerns of selection effects might be dispelled by noting that because entrance into a low-level crisis does not require significant costs or risks, strategic selection will be much less of a problem when dealing with a set of crises than a set of violent conflicts. In addition, the potential selection effects likely bias the observed impact of nuclear-weapons status toward zero—if there is nonrandom selection of more resolved types that participate in crises despite the disadvantage of facing nuclear states—which means that significant relationships should only become stronger if crisis selection were random.

Since it is rare for both actors in a directed dyad to prevail[11] and is common for each actor to have similar duration times, the observations are not independent of

Table 2
Probit Models of Crisis Outcomes

	(1) Victory	(2) Victory (Restrictive)	(3) Victory	(4) Victory (Restrictive)	(5) Defeat	(6) Defeat
Nuclear A	0.346**	0.247*	0.052	–0.008	–0.560**	–0.475*
	(0.141)	(0.142)	(0.162)	(0.167)	(0.186)	(0.205)
Nuclear B	–0.150	–0.288*	–0.056	–0.260*	0.575**	0.366**
	(0.121)	(0.133)	(0.149)	(0.156)	(0.122)	(0.151)
Nuclear A & B	–0.166	–0.362*	–0.181	–0.346*	–0.292	–0.246
	(0.222)	(0.207)	(0.223)	(0.205)	(0.228)	(0.231)
Salience			0.030	–0.252**		–0.225*
			(0.092)	(0.096)		(0.104)
Nuclear A × salience			0.807**	0.645**		–0.320
			(0.231)	(0.214)		(0.284)
Nuclear B × salience			–0.245	–0.078		0.529**
			(0.217)	(0.236)		(0.216)
Capability share	0.239	–0.001	0.290*	0.032	0.106	0.066
	(0.147)	(0.154)	(0.149)	(0.157)	(0.161)	(0.164)
Superpower A	0.102	0.481**	0.109	0.490**	0.300	0.317
	(0.155)	(0.156)	(0.161)	(0.157)	(0.202)	(0.208)
Target A	0.436**	0.516**	0.426**	0.473**	–0.322**	–0.335**
	(0.078)	(0.084)	(0.081)	(0.085)	(0.096)	(0.098)
Previous crisis A	0.233	0.245	0.271	0.281	–0.434*	–0.468*
	(0.201)	(0.219)	(0.203)	(0.219)	(0.217)	(0.219)
Violence	0.070*	0.007	0.037	0.037	–0.025	0.014
	(0.030)	(0.032)	(0.038)	(0.037)	(0.033)	(0.039)
Constant	–0.643**	–0.855**	–0.592**	–0.851**	–0.606**	–0.593**
	(0.140)	(0.148)	(0.144)	(0.151)	(0.154)	(0.157)
Observations	1,218	1,218	1,218	1,218	1,218	1,218

Note: Robust standard errors in parentheses, clustered on each non-directed dyad
* Significant at 5%; ** significant at 1% in a one-tailed test

each other. Observations from the same crisis will be interdependent. In effect, this inflates the number of observations and thus deflates the estimated standard errors. To correct for this, all models use robust standard errors, clustered on each nondirected-crisis dyad pair.

Results

Nuclear Status and Bargaining Gains

Table 2 presents the probit results of whether crisis actors are effectively able to succeed in gaining concessions, or at least, in not yielding to demands. Model 1 uses the less restrictive measure of victory to better account for endogenous demands, while Model 2 uses the more conventional measure directly from the ICB outcome variable. Models 3 and 4 include the indicator of a severe threat and its interaction with the nuclear-status variable to test Hypothesis 5.

The first two models demonstrate that in comparison to nonnuclear actors, nuclear states have an increased probability of prevailing against nonnuclear opponents. The coefficient on the nuclear status of the opponent also provides some support, as it is negative in both models and statistically significant in model 2. The most direct test of Hypothesis 1 is whether a nuclear state tends to gain more often, but we might also expect that opponents of nuclear states would be less able to succeed in their crises. A corollary to Hypothesis 1 would expect this variable to be negative, as nonnuclear states will find their chances of winning concessions diminished in the face of high expected costs of crisis against a nuclear opponent. Model 5 provides a more direct test of this corollary hypothesis by using defeat, taken directly from the ICB data, as the dependent variable. From the results of this model, nonnuclear opponents of nuclear states are more likely to face defeat, while nuclear states are less likely to realize defeat in their crises against nonnuclear states.

The results also provide some support for Hypothesis 3, as the bargaining advantage of nuclear weapons only appears to hold against nonnuclear states. A linear combination test reveals that states in symmetric nuclear dyads are less likely to prevail than nuclear states in asymmetric dyads, and this difference is statistically significant ($p < .001$ in a one-tail test) in model 2 and approaching significance ($p < .07$) in model 1. That is, nuclear states are less likely to achieve concessionary gains or force an opponent to back down against another nuclear state than against a nonnuclear state. Moreover, in model 5, a linear combination test reveals that nonnuclear opponents of nuclear states are significantly more likely to experience defeat than nuclear opponents, again demonstrating that nuclear states have less of a bargaining advantage in symmetric dyads.

The ongoing inability for other nuclear powers to push North Korea into an agreement— or keep it to an agreement—illustrates the limitations for nuclear states to use their weapons for general bargaining strength against other nuclear states. Also demonstrative of this point is the dispute between Russia/USSR and China over territorial claims along the Ussuri River, which nearly escalated to war in 1969 and only recently realized a compromise settlement. While nuclear weapons may have had some influence in tempering escalation dynamics in this conflict, it does not appear that they helped either side attain their preferred outcome in an expedited fashion.

Hypothesis 5 expected the relationship between weapon status and crisis outcome to be weaker at low levels of intensity because it simply is less believable to expect nuclear weapons to have an influence over crises with relatively minor salience. In support, we see that an interaction between the high-intensity indicator and weapons status of the crisis actor is positive and statistically significant in models 3 and 4. It is worth noting that the nuclear-status constitutive term is not statistically significant in these two models. That is, when the salience dummy variable is zero, the relationship between nuclear status and victory is not statistically significant. At high intensity, nuclear states are more likely to have enhanced bargaining leverage when compared to nonnuclear states.[12] Model 6 provides additional confirmation to Hypothesis 5, as nonnuclear opponents of nuclear states are especially more likely to experience defeat in highly salient crises.

The censored probit models, which adjust for nonrandom selection into a crisis, are given in Table 3. Models 7 and 8 demonstrate the robustness of the findings. When accounting for the nonrandom selection into mediation, nuclear states still are more likely to succeed in achieving their demands and getting the opponent to back down against nonnuclear states.[13] Moreover, that relationship is much stronger in high-salience cases than in ones without a substantial threat involved. It is interesting that in the selection equations, the possession of nuclear weapons has a statistically significant and positive relationship with crisis involvement, consistent with the findings in Rauchhaus (2009, this issue) that symmetric and asymmetric nuclear dyads are more likely to experience militarized interstate disputes. Although the rho statistic is statistically significant, we use the noncensored probit models for substantive interpretations because the results are quite similar in the regular probit models.

Returning to model 1 in Table 2, we derive some predictions about the impact of nuclear weapons, given different levels of intensity and holding all control variables at their median values. Table 4 presents the predicted probabilities of an actor reaching a beneficial outcome, calculated using CLARIFY (King, Tomz and Wittenberg 2000; Tomz,Wittenberg and King 2003). When evaluating all crises, nonweapon states have about a 40 percent probability of prevailing in their crises. This probability increases to 54 percent for nuclear states in asymmetric dyads and drops back to 41 percent in a symmetric dyad. The positive impact of nuclear weapons in asymmetric dyads is even more stark in high-salience crises, in which the probability of success is about 74 percent, as compared to 44 percent for nonnuclear states and 66 percent for nuclear states in symmetric dyads. The starker effects of nuclear status in the third column of Table 4 compared to the second one again confirm the conditioning effect of salience.

Nuclear Status and Crisis Duration

Turning to the hypotheses concerning the duration of crises, we also see substantial support for Hypothesis 2 and qualified support for Hypothesis 4. Table 5 presents the duration models. All the coefficients in these models are in terms of the nonexponentiated coefficients: positive coefficients indicate a higher likelihood of early termination.

Model 11 presents the basic model for crisis duration. We find that nuclear states and opponents of nuclear states face significantly shorter crises. Recall that the logic behind Hypothesis 2 is that opponents of nuclear states will be eager to end a crisis

Table 3
Selection Models

	(7) Victory	(8) Victory	(9) Duration	(10) Duration
Nuclear A	0.326*	0.023	0.301*	0.130
	(0.154)	(0.167)	(0.148)	(0.173)
Nuclear B	–0.131	–0.039	0.331**	0.129
	(0.133)	(0.166)	(0.124)	(0.140)
Nuclear A & B	–0.122	–0.129	–0.389	–0.393
	(0.206)	(0.201)	(0.308)	(0.295)
Salience		0.012		–0.444**
		(0.102)		(0.116)
Nuclear A × salience		0.832**		0.465**
		(0.273)		(0.157)
Nuclear B × salience		–0.230		0.559**
		(0.257)		(0.162)
Capability share	0.224	0.275	0.016	0.007
	(0.169)	(0.171)	(0.043)	(0.041)
Superpower A	0.077	0.0780	–0.045	–0.025
	(0.159)	(0.167)	(0.151)	(0.146)
Target A	0.350	0.395*	–0.015	–0.017
	(0.224)	(0.219)	(0.178)	(0.176)
Previous crisis A	0.479**	0.470**	0.062	2.10e-04
	(0.093)	(0.093)	(0.074)	(0.072)
Violence	0.069*	0.038	–0.175**	–0.109*
	(0.037)	(0.046)	(0.045)	(0.050)
Constant	–0.832**	–0.796**	–4.282**	–4.288**
	(0.174)	(0.180)	(0.222)	(0.212)
Selection equations				
Nuclear A	0.159*	0.159*	0.111**	0.111**
	(0.074)	(0.074)	(0.044)	(0.044)
Nuclear B	0.537**	0.537**	0.343**	0.343**
	(0.072)	(0.072)	(0.046)	(0.046)
Nuclear A & B	–0.272*	–0.272*	–0.215*	–0.217*
	(0.163)	(0.163)	(0.130)	(0.131)
Capability share	–0.439**	–0.439**	–0.248**	–0.248**
	(0.019)	(0.020)	(0.010)	(0.010)
Superpower A	0.224**	0.224**	0.125*	0.125*
	(0.092)	(0.092)	(0.059)	(0.059)
Previous crisis A	–0.637**	–0.637**	–0.376**	–0.376**
	(0.085)	(0.085)	(0.052)	(0.052)
Contiguity	1.263**	1.263**	0.864**	0.865**
	(0.072)	(0.072)	(0.053)	(0.053)
S-score	0.0181	0.0180	0.0141	0.0141
	(0.023)	(0.023)	(0.013)	(0.013)
Enduring rivalry	1.717**	1.716**	1.664**	1.670**
	(0.120)	(0.120)	(0.114)	(0.114)

Table 3 (continued)

	(7) Victory	(8) Victory	(9) Duration	(10) Duration
Peace years	–0.111**	–0.111**	–0.067**	–0.067**
	(0.012)	(0.012)	(0.007)	(0.007)
Peace years^2	0.004**	0.004**	0.002**	0.002**
	(0.001)	(0.001)	(3.30e-04)	(3.30e-04)
Peace years^3	$-3.32e^{-05}$**	$-3.32e^{-05}$**	$-2.01e^{-05}$**	$-2.01e^{-05}$**
	$(7.40e^{-06})$	$(7.40e^{-06})$	$(4.32e^{-06})$	$(4.32e^{-06})$
Constant	–1.533**	–1.532**	–1.058**	–1.058**
	(0.079)	(0.079)	(0.049)	(0.049)
Rho	0.090*	0.098*	–0.136**	–0.124**
	(0.042)	(0.044)	(0.028)	(0.031)
Observations	98,522	98,522	98,522	98,522

Note: Robust standard errors in parentheses, clustered on each nondirected dyad.
*significant at 5%. **significant at 1% in a one-tailed test.

because the expected costs are higher on average. As a result, the most direct test of this hypothesis is the coefficient on the nuclear status of the opponent (NUCLEAR B). Opponents of nuclear states will tend to shorten their crises by removing themselves early. The coefficient on the nuclear status of the crisis actor (NUCLEAR A) also examines Hypothesis 2, although it is perhaps not as direct a test because the logic is that nuclear states are the beneficiaries of shorter crises and not the actors that are actually responsible for early termination. Regardless, the results confirm that nuclear states and their nonnuclear opponents are more likely to be in shorter crises.

While the NUCLEAR A and NUCLEAR B coefficients are positive and statistically significant, the symmetric-dyad term is negative and statistically significant. When comparing states in symmetric nuclear dyads to opponents of nuclear states in asymmetric dyads, a linear combination test reveals that the former are prone to have longer crises, as expected in Hypothesis 4, but the difference is not statistically significant. That is, the results indicate with a high degree of confidence that nonnuclear opponents of nuclear states will tend to have shorter crises than states in nonnuclear dyads, but we do not have high confidence that they will tend to have shorter crises than states in symmetric nuclear dyads.

Model 12 assesses the role of crisis salience in making nuclear weapons more relevant to crisis duration. The interaction between a severe threat and the nuclear status of the opponent is positive and statistically significant. This provides further evidence in support of Hypothesis 5, as crises are even shorter when actors face nuclear opponents and there is both a threat of great damage and some violence. The interaction involving the nuclear status of the actor under observation is also positive and statistically significant. Note again that the coefficients on the nuclear-status

Table 4
Probability of Victory and Expected Crisis Duration

	All Crises	Low Salience	High Salience
Probability of victory			
Nonweapon state	0.399	0.369	0.443
	(0.018)	(0.028)	(0.024)
Asymmetric dyad	0.535	0.418	0.736
	(0.053)	(0.070)	(0.077)
Symmetric dyad	0.411	0.282	0.658
	(0.082)	(0.086)	(0.154)
Expected crisis duration, in days			
Nonweapon state	163.38	120.64	246.07
	(12.05)	(11.53)	(25.27)
Asymmetric dyad	111.39	105.42	115.69
	(14.94)	(19.66)	(18.46)
Symmetric dyad	147.79	145.86	114.49
	(33.14)	(41.35)	(36.30)

constitutive terms are not statistically significant with the interactions included. When the salience variable is zero, there is no statistically significant relationship between nuclear status and duration. Only in the salient cases do we observe nuclear weapons having a meaningful dampening effect on crisis length. So, the presence of a severe threat is needed for nuclear weapons to have a statistically significant shortening effect on international crises. Nuclear weapons are much less relevant when there is minimal salience.

Israel's conflicts with its Arab neighbors illustrate the conditional effect of nuclear weapons on both the probability of victory and crisis length. Notable conflicts that ended with compromises or stalemates tend to have occurred either when Israel did not yet have nuclear-weapon capability—as during the Sinai incursion crisis and the War of Attrition—or when the relative salience was low—as in the Lebanese interventions, which had much lower stakes than other conflicts with either existential threats or global geopolitical implications (Ben-Yehuda 2001). These crises also tended to drag on, especially when compared to many of the crises involving a nuclear Israel and high salience, as in the Six Day War, October War, and preventive strikes against the Iraqi and Syrian nuclear-weapons programs, all of which also had relatively definitive outcomes.

Models 9 and 10 of Table 3 again demonstrate the robustness of the findings. In simultaneous equation models that adjust for correlation in the disturbances of the crisis selection and outcome processes, nuclear weapons still shorten the crises for nuclear states and their nonnuclear opponents. It does not appear that the nonrandom

Table 5
Duration Models of Crisis Length

	(11) Cox	(12) Cox
Nuclear A	0.302**	0.149
	(0.112)	(0.137)
Nuclear B	0.311**	0.145
	(0.099)	(0.119)
Nuclear A & B	–0.525*	–0.499*
	(0.241)	(0.228)
Salience		–0.369**
		(0.097)
Nuclear A × salience		0.395**
		(0.136)
Nuclear B × salience		0.450**
		(0.137)
Capability share	0.016	0.001
	(0.037)	(0.037)
Superpower A	–0.020	–4.08e-04
	(0.133)	(0.132)
Target A	0.019	–0.026
	(0.060)	(0.058)
Previous crisis A	–0.107	–0.082
	(0.142)	(0.142)
Violence	–0.142**	–0.087*
	(0.037)	(0.043)
Observations	1,218	1,218

Note: Robust standard errors in parentheses, clustered on each nondirected dyad.
*significant at 5%. **significant at 1% in a one-tailed test.

selection produces biased inferences in these models, even though the correlations between the selection and outcome equations are statistically significant.

Table 4 gives the expected length of crisis for these different types of actors. Most notably, in the high-intensity crises in which nuclear-weapon status matters most, nuclear-weapon states are expected to last only 116 days in crisis against a nonnuclear state. This is substantially less than the 246 days that a nonnuclear state is expected to last against a nonnuclear opponent. Note, however, that the average length of crisis for nuclear states in symmetric dyads is nearly the same as those in asymmetric dyads, indicating that all opponents of nuclear states, nuclear and nonnuclear, are less willing to endure a crisis when the stakes are high. The conditioning effect of salience is again evident, as there is much less of an effect of nuclear status in the low-salience cases.

Alternative Explanations

The connection between nuclear weapons and the ability to prevail lends itself to alternative explanations that would call into question whether nuclear weapons themselves actually cause states to perform better in coercive diplomacy. In particular, many of the nuclear states tend to be allies of the United States or permanent members of the UN Security Council. Such states represent the status-quo arrangement of power in the international system, as they have better access to leverage—via the hegemon or the United Nations—by which they can shape the system in their favor peacefully. Consequently, they are likely to be more content about their geopolitical position and perceive a higher level of security. With less of a need to use coercive means to change their security environment, these "status quo" states are freer to selectively choose to enter those crises in which there is a high likelihood of gaining more concessions. To address this alternative explanation for the relationship between nuclear status and crisis success, we run a model that controls for whether a state has a defense pact with the United States—using the Alliance Treaty Obligations and Provisions (ATOP) data coded by Leeds et al. (2002)—or is a P-5 member. In models 13 and 14 of Table 6, we observe that the relationship between nuclear status and gaining concessions remains relatively unchanged.

Michael Horowitz (2009, this issue) demonstrates the importance of considering how the impact of nuclear weapons on coercive diplomacy might change depending on how long a state has had the capability. New nuclear states may be more dissatisfied than mature nuclear states because the weapons give them a boost in their power status, and thus, an incentive to restructure the terms of their existing arrangements. If states that initiate crises—the dissatisfied states—tend to be the ones that win, then we might expect only new nuclear states to prevail more. While the previous models control for whether a state was the target of a crisis, we attempt to gain additional leverage on this argument by checking to see if "young" nuclear states that have developed their capability in the previous ten years—and that are thus prone to be dissatisfied—are more apt to win in their crises than more "mature" nuclear states that have had an opportunity to restructure their bargaining positions. As models 15 and 16 of Table 6 demonstrate, we observe that both types of nuclear states fare well in gaining concessions, although the relationship between new nuclear states and crisis success is only statistically significant in model 15. Mature nuclear states tend to win just as well as, if not more than, new nuclear states still adapting to their new bargaining position.

Conclusion

Why do states proliferate? Nuclear weapons and the programs necessary to create them are expensive. They are dangerous. Other countries may attack a state while

Table 6
Robustness Checks

	(13) Victory	(14) Victory (Restrictive)	(15) Victory	(16) Victory (Restrictive)
Nuclear A	0.523**	0.298*		
	(0.154)	(0.151)		
Nuclear B	–0.149	–0.271*	–0.152	–0.289*
	(0.122)	(0.133)	(0.121)	(0.133)
Nuclear A & B	–0.193	–0.378*	–0.168	–0.366*
	(0.223)	(0.207)	(0.222)	(0.208)
Capability share	0.275*	0.012	0.234	–0.006
	(0.147)	(0.154)	(0.148)	(0.155)
Superpower A	0.398*	0.644**	0.082	0.469**
	(0.208)	(0.215)	(0.157)	(0.159)
Target A	0.438**	0.520**	0.432**	0.512**
	(0.078)	(0.084)	(0.079)	(0.085)
Previous crisis A	0.347	0.325	0.230	0.242
	(0.213)	(0.230)	(0.201)	(0.219)
Violence	0.063*	0.008	0.070*	0.007
	(0.031)	(0.032)	(0.030)	(0.032)
P-5 State	–0.501**	–0.205		
	(0.192)	(0.198)		
U.S. defensive ally	0.003	0.143		
	(0.105)	(0.107)		
New nuclear state			0.295*	0.202
			(0.168)	(0.170)
Mature nuclear state			0.396**	0.285*
			(0.168)	(0.168)
Constant	–0.653**	–0.914**	–0.638**	–0.850**
	(0.149)	(0.160)	(0.141)	(0.149)
Observations	1,218	1,218	1,218	1,218

Note: Robust standard errors in parentheses, clustered on each nondirected dyad.
*significant at 5%. **significant at 1% in a one-tailed test.

it is trying to create a nuclear arsenal, and there is always the risk of a catastrophic accident. Nuclear weapons may help generate existential threats by encouraging first-strike incentives among a state's opponents. This article has explored the incentives that make nuclear weapons attractive to a wide range of states despite their costly and dangerous nature. We have found that nuclear weapons provide more than prestige, they provide leverage. They are useful in coercive diplomacy, and this must be central to any explanation of why states acquire them.

Since August 9, 1945, no state has used a nuclear weapon against another state, but we find evidence that the possession of nuclear weapons helps states to succeed in their confrontations with other states even when they do not "use" these weapons.

Conflict with nuclear actors carries with it a potential danger that conflict with other states simply does not have. Even though the probability of full escalation is presumably low, the evidence confirms that the immense damage from the possibility of such escalation is enough to make an opponent eager to offer concessions. Asymmetric crises allow nuclear states to use their leverage to good effect. When crises involve a severe threat—and nuclear use is not completely ruled out—the advantage that nuclear actors have is substantial. Nuclear weapons help states win concessions quickly in salient conflicts. Consistent with the other articles in this journal issue and the editors' introduction (Gartzke and Kroenig 2009, this issue), we report that nuclear weapons confer tangible benefits to the possessors. These benefits imply that there should be a general level of demand for nuclear weapons, which means that explanations for why so few states have actually proliferated should focus more on the supply side, as applied by Matthew Kroenig (2009, this issue) and Matthew Fuhrmann (2009, this issue).

The findings here importantly suggest an additional reason why "proliferation begets proliferation," in the words of George Shultz (1984, 18). If both parties to a crisis have nuclear weapons, the advantage is effectively cancelled out. When states develop nuclear weapons, doing so may encourage their rivals to also proliferate for fear of being exploited by the shifting bargaining positions. And once the rivals proliferate, the initial proliferator no longer has much bargaining advantage. On one hand, this dynamic adds some restraint to initial proliferation within a rivalry relationship: states fear that their arsenal will encourage their rivals to pursue nuclear weapons, which will leave them no better off (Davis 1993; Cirincione 2007). On the other hand, once proliferation has occurred, all other states that are likely to experience coercive bargaining with the new nuclear state will also want nuclear weapons. The rate of proliferation has the potential to accelerate because the desire to posses the "equalizer" will increase as the number of nuclear powers slowly rises.

Our theoretical framework and empirical findings are complementary to Gartzke and Jo (2009, this issue), who posit and find that nuclear states enjoy greater influence in the international realm. An interesting dynamic emerges when comparing the results to Rauchhaus (2009, this issue), who finds that nuclear weapons in asymmetric dyads tend to increase the propensity for escalation. We have argued that nuclear weapons improve the bargaining leverage of the possessors and tested that proposition directly. It is important to note that the factors that shape conflict initiation and escalation are not necessarily the same factors that most shape the outcome of the conflict. Even so, one explanation for why a stronger bargaining position does not necessarily produce less escalation is that escalation is a function of decisions by both sides, and even though the opponent of a nuclear state is more willing to back down, the nuclear state should be more willing to raise its demands and push for a harder bargain to maximize the benefits from the nuclear weapons. Nuclear-weapon states appear to need ever-greater shares of their bargains to be satisfied, which helps to explain both their proclivity to win and their proclivity toward aggressive coercive diplomacy. An important implication in light of these findings is thus that even though nuclear-weapon states tend to fare better at the end of their crises, this does not necessarily mean that the weapons are a net benefit for peace and stability.

Notes

1. States that appear in the Hewitt (2003) data but not in the actor-level ICB data—when they are belligerents but do not actually perceive a crisis—are still included because their nuclear weapons still potentially shape their outcome from the dispute.

2. Another advantage of the ICB data is that they have multiple outcome measures coded that can be adapted easily for analysis of the dynamics being considered here, and for this reason, have been used in recent quantitative studies of crisis outcomes (Gelpi and Griesdorf 2001; Chiozza and Goemans 2004; Lai 2004).

3. One might suspect that actors rarely express dissatisfaction with a crisis outcome, because they face audience costs. This does not appear to be the case, as more than a third of the crisis actors are coded as dissatisfied in the ICB data.

4. The high proportion of nuclear powers in international crises is partly explained by the opportunity for the superpowers to be involved in many different conflicts across the globe. The results control for superpower status to account for the disproportionate presence of superpowers in international crises.

5. Issue type is not used solely as a measure of salience because it is, in part, picked up by the threat-severity measure and there is tremendous variation of salience within each issue type.

6. The gravity variable itself is not sufficient because we believe that having twenty-seven crisis dyads coded as having a threat of grave damage but without violence occurring allows for too many crises that might have had some potential for grave damage but that were really well contained.

7. The CINC index is the conventional measure of latent military capability in international conflict studies.

8. Also see Kroenig (2009, this issue) and Fuhrmann (2009, this issue).

9. By this operational definition, not all dyads have a targeted state if there are many dyads and some of the dyads consist of opponents that do not perceive each other as the key source of threat. That is, when actors are drawn into a conflict that is ongoing, there will sometimes be dyads in secondary conflicts in which neither state in the dyad perceives the other as the most serious threat, so those actors are not targets of aggression within that dyad.

10. A Schoenfeld test fails to reject the possibility of proportional hazards in the model. Weibull models produced similar results.

11. While rare, it is not impossible. When there are multiple issues, both actors could walk away feeling that they gained more than what they had under the status quo.

12. A linear combination confirms that states with nuclear weapons are significantly more likely to prevail against nonnuclear opponents when there is high salience.

13. The less restrictive measure of victory is used in these models, but similar results adhere when the other measure is used.

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