Date: October 25, 2014
Word count: 8,656

Dare to Fail:
Nuclear Superiority, Threat Initiation, and Compellent Success

Matthew Kroenig
Miriam Krieger
Hans Noel
Georgetown University

Are nuclear weapons effective tools of coercion? This question has become the subject of renewed academic debate with some scholars arguing that nuclear superior states are more likely to achieve their goals in crises and others claiming that nuclear weapons have no discernable effect on compellent threats. This article synthesizes these competing strands of scholarship by examining how the nuclear balance of power affects the initiation, conduct, and outcome of compellent threats. We argue that nuclear superior states are more likely to achieve compellent success because they are more willing to run the inherent risks involved in international coercion. Using data from the Militarized Compellent Threat Dataset, we show that states in a position of nuclear superiority are more likely to: issue compellent threats, show resolve in compellent settings, and ultimately achieve compellent success. This article demonstrates that nuclear superior states enjoy more coercive success because they are more willing to try.

In a speech at the University of Cape Town, South Africa in 1966 then U.S. Senator Robert Kennedy said, “only those who dare to fail greatly can ever achieve greatly.” Indeed, history is replete with examples of individuals who encountered many setbacks on their road to success. Thomas Edison tried thousands of different combinations of materials before finally landing on a successful prototype for the first functioning light bulb. Michael Jordan, perhaps the greatest basketball player of all time has said, “I've missed more than 9000 shots in my career. I've lost almost 300 games. 26 times, I've been trusted to take the game winning shot and missed. I've failed over and over and over again in my life. And that is why I succeed.” Ray Kroc was a struggling salesperson for decades until, in 1953, at the age of fifty-one, he became the franchising agent for the McDonald’s brothers hamburger restaurant in San Bernardino, California and launched one of the most successful business empires of all time (Kroc 1992). In the words of Thomas Edison, “The most certain way to succeed is always to try just one more time.”

There are many parallels between this life lesson and the subject of this article: nuclear compellent threats. Famed economist and nuclear strategist, Thomas Schelling (1966) argued that compellence, a military threat designed to alter the international status quo, is much harder than deterrence, a military threat designed to defend the status quo. Forcing another sovereign state to do one’s will at the barrel of a gun, therefore, may rightly be considered an attempt to, in Kennedy’s words, “achieve greatly.” Moreover, even attempting to engage in compellence requires daring as these “threats that leave something to chance” (Schelling 1966) mean running an inherent risk of international warfare. So, who are the states that dare to fail? Are nuclear-armed states more willing to run the risks of international coercion and are they more likely to ultimately succeed?

The effect of nuclear weapons on international coercion has recently become the subject of renewed academic debate. In a recent issue of *International Organization (IO)*, Sechser and Fuhrmann (2013) argue that nuclear weapons are not effective tools of compellence. They find that nuclear weapon states are no more likely to achieve compellent success than similar nonnuclear states. Sechser and Fuhrmann focus narrowly, however, on the outcome of compellent threats that take place, and not on how nuclear weapons might affect the initiation and conduct of compellence. In other words, they do not examine the Edison hypothesis that states with nuclear weapons are more likely to achieve compellent success because they are more likely to try. Moreover, they focus simply on whether the challenger possesses nuclear weapons, but do not carefully consider how the nuclear balance of power between challenger and target affects compellent threats.

In the same issue of *IO*, Kroenig (2013) argues that the nuclear balance of power is an important determinant of international coercion. Kroenig argues that a nuclear advantage increases a state's effective resolve, enabling it to run greater risks in a crisis, and providing it with a coercive edge. He finds that nuclear superior states are more likely to achieve their basic political goals in international crises. Kroenig's study focuses on nuclear crises, however, and does not allow him to speak to the specific question of militarized compellent threats.

Building on Kroenig (2013), this article applies arguments about nuclear superiority and resolve to the question of militarized compellent threats. We argue that the nuclear balance of power influences international coercion through its effect on a state's resolve. Nuclear superior states (defined as states that enjoy a nuclear advantage because they possess nuclear weapons and their opponent does not, or because they possess more nuclear weapons than their nuclear-armed opponent) will be more willing to run the risks of war inherent in international coercion.

Unlike the persistent individuals discussed above, however, we argue that nuclear superior states dare to fail, not due to internal fortitude, but because their expected costs to doing so are lower. Applied to militarized compellent threats, we hypothesize that states in a position of nuclear superiority will be more likely to issue compellent threats, to show resolve in compellent settings, and to achieve compellent success.

Drawing on the Militarized Compellent Threat (MCT) dataset, we find strong support for these hypotheses. In dyads involving at least one nuclear state since 1945, nuclear superior states have issued 49 compellent threats and have successfully compelled opponents in ten separate instances. In the same time period, the numerically equivalent nuclear inferior states have only even attempted compellence in three instances and were successful in only one (and arguably zero) cases. When considering all dyad years since 1945 (not only the instances in which compellent threats were actually issued and also including strictly conventional dyads), we find further support for our hypotheses in multivariate regression analysis: the nuclear balance of power is strongly correlated with the initiation of, demonstrations of resolve within, and outcomes of, compellent threats. These findings hold even after controlling for other factors thought to be associated with compellent threats, when using alternate measures for key variables, dropping prominent countries, and accounting for possible selection effects.

Fuhrmann and Sechser (2013) are correct to report that there is not a statistically significant difference between the rates of success between the nuclear and nonnuclear states that issue compellent threats, but this reported finding overlooks the fact that nuclear superior states are more likely to achieve compellent success because they are much more likely to make compellent demands in the first place. Indeed, the data show that since 1945 nuclear superiority

has been a near-necessary condition for even attempting international coercion in a dyad involving at least one nuclear-armed state.

These findings have important implications for international relations theory and international security policy. Compellence is difficult (Schelling 1966), and nuclear-armed states are not noticeably more effective than nonnuclear states once they have decided to issue a compellent threat (Fuhrmann and Sechser (2013), but this article shows that nuclear superior states enjoy more coercive success because they are more willing to try.

Explaining Nuclear Weapons and International Coercion

Kroenig (2013) argues that nuclear weapons are effective tools of coercion. Building on the work of Schelling (1966), Kroenig employs a nuclear brinkmanship theory framework and conceptualizes crises among nuclear-armed states as a "competition in risk taking." According to brinkmanship theory (Powell 1990) the state with the highest level of resolve, which can also be thought of as the state that is willing to run the greatest risk of war before backing down, will be more likely to achieve its basic goals in a crisis. In a theoretical refinement to previous models, Kroenig shows that nuclear superiority can contribute to a state's effective resolve. A nuclear advantage reduces a state's expected damage in the event of nuclear war, enabling it to run greater risks. In an analysis of 52 nuclear crisis dyads from 1945 to 2001, Kroenig finds that nuclear superior states are more likely to achieve their basic goals in international crises than similar nuclear inferior states.

Kroenig does not, however, distinguish between compellence (threats aimed at changing the status quo) and deterrence (threats designed to defend the status quo). He simply studies all

crises between nuclear-armed states, so his research design does not allow him to speak to the specific question of whether the nuclear balance of power affects compellent threats.

Secsher and Fuhrmann (2013) disagree that nuclear weapons are potent coercive instruments. They argue that nuclear weapons are ineffective tools of compellence for two reasons. First, nuclear weapons are not useful for taking or holding territory. Second, they argue that, given their immense destructive power, it is difficult for policymakers to credibly threaten nuclear use. Consistent with this perspective, in a test of 210 compellent threat episodes from 1918 to 2001, they find that nuclear-armed states are no more likely to achieve compellent success than nonnuclear states.

Sechser and Fuhrmann focus narrowly, however, on whether the challenger possesses nuclear weapons and do not carefully analyze how the nuclear balance of power between challenger and target might affect coercive outcomes.[1] Moreover, they exclusively study the outcome of compellent threats that take place and not on the antecedent causes of the initiation or conduct of compellent threats. This means that their study does not allow them to explore the idea that nuclear superior states are more likely to achieve compellent success because they are more willing to try.

This methodological choice is important. After all, states do not issue threats randomly. States in particular situations will be more likely to issue threats and the willingness to issue threats might contribute to overall levels of coercive success. As Fearon (1994) has argued, military power is an important factor in international politics, but because the balance of power is

[1] Sechser and Fuhrmann (2013) try a "Nuclear superiority" variable as a robustness test in a single regression model reported in a data appendix, but it is not at the center of their theoretical or empirical analysis.

known to leaders before entering into conflict, we might not see a relationship between military power and the outcomes of the confrontations that actually take place. Instead, we should expect the effects of military advantages to be exerted at the earlier, selection stage. This potential selection problem is particularly problematic for scholars, such as Sechser and Fuhrmann, who maintain that military power, in this case nuclear weapons, do not affect patterns of international coercion. By focusing only on the outcome of the threats that take place, they risk overlooking military power's most important effects at earlier stages.

In an attempt to account for this selection problem, Sechser and Fuhrmann report a robustness test using a Heckman selection model, but a "post-1945" dummy variable does not serve as an adequate exclusion restriction as the authors claim. The "post-1945" variable does predict having nuclear weapons, but the instrument is poor because pre-1945 and post-1945 cases are not comparable. The global system changed with the development of nuclear weapons, so, at best, their approach captures the effect of nuclear weapons that is due to the instrument, that is, due to the fact that nuclear weapons were invented, but not due to the other reasons for variation, such as that some states have them and others do not. Moreover, methodologists increasingly argue that the Heckman cure is worse than the disease and recommend improved approaches, such as including all the variables that could affect the selection and outcome stages into a single equation that models the outcome of interest only (Simmons and Hopkins 2005; Sartori 2003; Puhani 2000). Alternatively, instead of a reliance on complicated regression models in general, Achen (2005, 337) recommends "careful graphical and cross-tabular analysis" in order to "justify statistical specifications [and] show that they really fit the data." But such steps were not taken by Fuhrmann and Sechser and, as a result, their study does not provide a

satisfactory picture of how the nuclear balance of power affects the initiation, conduct, and outcomes of international coercion.

Other scholars have studied related issues including: nuclear weapons and crisis behavior (e.g., Beardsley and Asal 2009), nuclear weapons and initiation of international disputes (Gartzke and Jo 2009; Bell and Miller n.d.), nuclear posture and deterrence (Narang 2014), and the causes of nuclear proliferation (e.g., Sagan 1996/1997; Gartzke and Kroenig 2014). These scholars have not systematically studied, however, how the nuclear balance of power affects attempts to change the international status quo via militarized compellent threats.

Nuclear Superiority and Militarized Compellent Threats

This section presents a theory of the nuclear balance of power and compellent success. We build on Kroenig's (2013) model about how nuclear superiority influences international coercion and apply these insights to the specific issue of militarized compellent threats.

We ground our argument in a long line of international relations theorizing (Schelling 1960, Powell 1990, Kroenig 2013) that conceptualizes international coercion from a brinkmanship theory framework. In brinkmanship theory, states exert coercive pressure on an adversary by intentionally raising the risk of warfare to force an adversary to capitulate. States do not eagerly bid up the risk of war in these contests, however, because at each stage of the crisis, there is a nonzero risk that the crisis could spin out of control and result in a full-scale war, even if that is not the preferred outcome of either party. A military threat unleashes a sequence of events that cannot be completely controlled and is, in the words of Schelling (1966), a "threat that leaves something to chance." In a confrontation, therefore, leaders must make gut-wrenching

decisions between escalating the crisis and running an increased risk of war, or submitting and throwing an important geopolitical victory to an adversary.

In a brinkmanship framework, the state that achieves its goals will be the more resolved state, which can also be thought of as the state that is willing to hazard the highest risk of war before backing down. For this reason, Schelling (1966) called crises in the nuclear era "competitions in risk taking."

To understand the outcome of political conflicts of interest, therefore, one must understand the factors that encourage states to run risks. Brinkmanship theory and empirical studies have both demonstrated that a state's willingness to run risks is a function of the stakes in the crisis and of the expected cost of conflict (Powell 1990, Kroenig 2013).

The nuclear balance of power influences games of brinkmanship because it influences the expected cost of conflict (Kroenig 2013). There are meaningful distinctions in war outcomes, even nuclear war outcomes (Khan 1960), and the cost of nuclear war depends in large part on the nuclear balance of power (Glaser 1990). Since the cost of a full-scale war would be lower for states in a position of nuclear superiority, we should expect that nuclear superior states will be willing to hazard a higher risk of war and will, therefore, be more likely to prevail in instances of international coercion (Kroenig 2013).

We now apply these insights to the discussion of nuclear weapons and compellence. Issuing a militarized compellent threat, like playing a game of brinkmanship, is making a "threat that leaves something to chance." States might hope that their adversary will immediately capitulate in response to the threat, but there is always some risk that the confrontation will escalate and result in catastrophe. We should expect that because the costs of war are lower, on average, for nuclear superior states that they will be more likely to run the inherent risks

associated with issuing compellent threats. On the other hand, because the costs of conflict with a nuclear superior state are more devastating, we should expect that nuclear inferior states will have a lower tolerance for intentionally generating a risk of war by making compellent threats. This leads us to our first hypothesis:

H1: Nuclear superior states will be more likely to issue compellent threats.

Just as nuclear superior states are more likely to generate risk by initiating a crisis, they should be more willing, on average, to assume greater risk as the crisis develops. In a brinkmanship framework, states have two options at each stage of the dispute; they can escalate or submit. Perhaps the most obvious way in which a state can escalate a confrontation is by visibly displaying its resolve through a show of force. International relations scholars have shown that costly signals, those that tie hands or sink costs, increase the credibility of threats (Fearon 1997) and that military mobilizations both tie hands and sink costs (Slantchev 2005). States that engage in a show of force in a crisis, therefore, send a costly signal that demonstrates their seriousness and enhances the credibility of their threats (Sechser and Furhammn 2013). But not all states will be willing to incur the risk of war and a state's risk tolerance will hinge on the stakes of the crisis and the expected costs of war. Since the expected costs of war are lower, on average, for nuclear superior states, they should be more willing to show resolve in a crisis. This leads us to our second hypothesis.

H2: Nuclear superior states will be more likely to demonstrate resolve in a compellent threat episode.

Finally, since nuclear superior states will be more willing to issue threats, signal resolve, and to otherwise run the risks of war associated with international coercion, we should also expect that they will be more likely to meet with success in these "competitions in risk taking." This does not necessarily mean that there will be clear evidence that nuclear superior states will have a higher rate of success once a threat has been issued, although that is one possible expectation from this theoretical setup. Rather, there is also strong theoretical reason (Fearon 1994) to expect that the advantages of nuclear superiority will be felt most strongly at earlier selection stages and that nuclear superior states will be more likely to achieve compellent success in part because they will issue compellent threats with greater frequency. This brings us to our final hypothesis.

H3. Nuclear superior states will achieve compellent success more often than other types of states.

These three hypotheses, while logically related, are distinct. Support for any of these hypotheses would be consistent with the broader notion that the nuclear balance of power is relevant to international coercion. Evidence for multiple hypotheses would provide even stronger support. We now turn to the empirical evidence.

Empirical Analysis

To test the hypotheses about the nuclear balance of power and compellent threats, we draw on the Militarized Compellent Threat dataset (Sechser 2011), the same dataset employed by Sechser

and Fuhrmann (2013).[2] The dataset contains 210 observations of interstate compellent threats and 242 challenger-target dyads, occurring between 1918 and 2001. In each coded episode, a challenger issued a compellent demand against a target state and threatened to use force if the target refused to comply. Since our hypotheses deal with nuclear weapons, we focus on the nuclear era from 1945 to 2001, which leaves us with 118 compellent threat episodes.[3] To examine how the nuclear balance of power affects the initiation and outcome of compellent threats, we embed the MCT data in a larger dataset that includes information on all directed dyads in the international system from 1945 to 2001 extracted using EUGene (Bennet and Stam 2001). Since 26% of all international conflicts occur among "politically irrelevant" dyads (Braumoeller and Carson 2011), we include all dyads, not just the so-called "politically relevant" dyads in our analysis. All variables are from Sechser and Fuhrmann (2013) unless otherwise noted.

The Data

This study examines three dependent variables. To gauge the determinants of compellent threat initiation, we include *Threat initiation*, a dichotomous variable coded "1" if the challenger issued

[2] Scholars have raised concerns about the quality of this relatively new dataset (Kroenig 2013) and we share them. Still, we employ the dataset because this remains the only dataset designed specifically to measure compellent threats, the central subject of this study.

[3] The findings are robust to the inclusion of data from the pre-1945 period. We focus on the post-1945 period because one cannot draw meaningful insights about the correlation between two variables from observations in which variation on the key explanatory variable was not even possible.

a MCT in a given dyad-year and "0" otherwise. *Resolve* is a dichotomous variable coded "1" if the challenger engaged in a show of military force or conspicuous military mobilizations during a threat episode, and "0" otherwise. Our final dependent variable is the success of the compellent threat. A threat is successful when a target state voluntarily complies with all compellent demands without the challenger having to resort to the use of military force. *Success* is a dichotomous variable coded "1" if the episode was resolved successfully and "0" otherwise.

Our key independent variable is *Nuclear superiority*. We follow previous research (Kroenig 2013) in coding this dichotomous variable "1" if the challenger possesses more nuclear warheads than its opponent in a given year and "0" otherwise. For additional tests and analysis, we code several other measures of the nuclear balance of power. *Nuclear inferiority*, the opposite of *Nuclear superiority,* assesses whether a state has fewer warheads than an opponent. *Nuclear challenger* is a dichotomous variable that measures whether the challenger possesses nuclear weapons. *Nuclear difference* codes the number of nuclear weapons possessed by the challenger, subtracted by the number of nuclear weapons possessed by the target.

We also control for other potentially confounding factors. To account for conventional military power, we include *Capability ratio*. It is a ratio of the combined capabilities of the challenger divided by the total combined capabilities of both the challenger and the target. Because states may be more or less compliant towards challengers with whom they have a history of armed conflict, we include *Dispute history*, a continuous variable counting the number of militarized interstate disputes that occurred between challenger and target over the previous 15 years. Finally, it can be argued that the subject over which a threat is issued may drive the propensity for challenger resolve: a high-stakes issue such as regime change is less likely to result in target capitulation than a comparatively minor issue such as trade policy. To that end,

we control for *Stakes*, a dichotomous variable coded "1" if the dispute is over territorial or leadership concerns, and "0" if it centers on less important matters.

To account for selection into a threat episode, we also control for factors shown in previous studies to correlate with international conflict that were not already included above. States in close geographic proximity are more likely to engage in conflict with one another (Boulding 1962). It is common practice to control for both geographical distance and contiguity in quantitative analysis of international conflict (e.g., Gartzke 2007). We follow this convention and include both variables. *Contiguity* is an ordinal variable identifying geographic proximity on a six-point scale. *Distance* measures distance in miles between countries in a dyad. The democratic peace hypothesis holds that the presence of joint democracy reduces the probability of conflict (Oneal and Russett 1997). To measure *Joint democracy*, we code a dichotomous variable measuring whether both states in a given dyad possess a Polity IV score of seven or greater (Jaggers and Gurr 1995).

Analysis

Our central hypotheses concern the effect of the nuclear balance of power on the initiation, conduct, and outcome of militarized compellent threats. Several types of statistical analysis prove useful in exploring the evidence for and against each hypothesis. To begin the investigation, we conduct a careful cross-tabular analysis of the data to assess the relationship between the nuclear balance of power and patterns of militarized compellent threats (Table 1). The cross-tabular analysis is only the first step, however. Next, we turn to the regression analysis. We employ Probit analysis with robust standard errors adjusted for clustering by dyad. To correct for temporal dependence, we include *t, t2,* and *t3* as recommended by Carter and

Signorino (2010). We first examine the simple bivariate relationship between *Nuclear superiority* and our key dependent variables. Next, to account for potentially confounding factors, we then evaluate the effect of the explanatory variable after including control variables (Table 2). Finally, we present odds ratios to assess the substantive effect of *Nuclear Superiority* on compellent-threat related dependent variables (Figure 1).

We first explore the idea, expressed in Hypothesis 1, that nuclear superior states will be more likely to issue compellent threats. Turning to Table 1, we find strong support for this hypothesis. Looking first to the dyads with at least one nuclear-armed power, we can see that, since 1945, nuclear inferior states have been incredibly reluctant to issue compellent threats. There have been zero instances of a nuclear-armed, but inferior state attempting to compel a nuclear superior state. Similarly, there have been only three instances of a nonnuclear state attempting to compel a nuclear-armed state. In total, therefore, nuclear inferior states have attempted to compel superior opponents three times since 1945. In other words, nuclear inferior states attempted to compel adversaries once in roughly every 15,000 opportunities.

In contrast, we see that nuclear superior states have been much more likely to issue compellent threats. Since 1945, nuclear superior states have attempted to compel inferior opponents 49 times, or one compellent attempt for every 1,000 opportunities. This includes 42 attempts to compel nonnuclear states and seven attempts to compel nuclear-armed, but inferior states.

In other words, since 1945, the small handful of nuclear-armed states have issued 41.5% of all compellent threats, of which 39% were issued by nuclear superior states and only 2.5% by nuclear inferior states. This large difference in threat initiation rates cannot be explained by

larger numbers of nuclear superior states as these are symmetrical concepts and the number of nuclear inferior and nuclear superior dyads in the dataset is exactly equal.

Broadening our perspective to include strictly conventional dyads, we find additional support for our hypothesis. Nonnuclear powers threaten each other at roughly the same rate as nuclear inferior states. Since 1945, nonnuclear states have threatened their nonnuclear adversaries 66 times in 1.1 million possible observations, or once in every 17,500 opportunities. The chi-squared statistic indicates that the probability of observing this difference if nuclear superiority has no effect on the issuance of a compellent threat is less than 0.000. This analysis provides evidence of a powerful link between the nuclear balance of power and the initiation of militarized compellent threats.

Turning to the regression analysis in Table 2, we find additional support for this hypothesis even after possible confounding factors are taken into account. The sign on the coefficient of *Nuclear superiority* is positive and statistically significant in a bivariate (model 1) and fully-specified (model 2) model, indicating that there is a strong relationship between nuclear superiority and the initiation of militarized compellent threats.

This effect is substantively, as well as statistically, significant. As we can see in Figure 1, nuclear superior states are over nine times more likely to issue a militarized compellent threat than are similar states that lack nuclear superiority.

This analysis provides clear support for Hypothesis 1. There is overwhelming support for the idea that the nuclear balance of power affects the initiation of militarized compellent threats.

Next, we turn to Hypothesis 2 to examine the idea that nuclear superior states will be more likely to demonstrate resolve in compellent threat episodes. Turning back to Table 2, we find support for this hypothesis. There is a strong and statistically significant relationship

between nuclear superiority and military mobilizations during a compellent threat episode in the bivariate regression (model 3) and once other confounding factors are taken into account (model 4), Figure 1 illustrates the substantive size of this effect. Nuclear superior states are nearly eighteen times more likely than other similar states to engage in a visible demonstration of resolve.

Thus, Hypothesis 2 also finds support in the empirical analysis. Nuclear superior states are more likely to demonstrate resolve in a militarized compellent threat episode.

Finally, we turn our attention to Hypothesis 3 to examine whether nuclear superior states are more likely to achieve compellent success. To do so, we begin by returning to Table 1. Starting with the subset of dyads involving at least one nuclear-armed state, we can see that nuclear inferior states' compellent attempts rarely (and arguably never) succeed. There are zero examples of a nuclear-armed, but inferior, state successfully compelling a nuclear superior state. Indeed, as pointed out above, such a threat has never even been attempted. Moreover, according to the MCT dataset, there has been only one instance of a nonnuclear state successfully compelling a nuclear state. MCT codes Turkey as successfully compelling the United Kingdom in 1963. A close examination of the case, however, does not support this coding decision.

Following Cyprus's independence in 1960, the country adopted a new constitution, which established a complicated power-sharing arrangement between the island's majority Greek Cypriot and minority Turkish Cypriot populations (Mallinson 2005). Supplementing the constitution was the Treaty of Guarantee, which established Britain, Turkey, and Greece as the "Guarantor Powers," entrusted with the protection of Cyprus's constitution, sovereignty, and independence. In 1963 the internal power-sharing arrangement broke down, resulting in interethnic conflict, which prompted Britain, Turkey, and Greece to stand up a peacekeeping

force, the Joint Truce Force, to quell the violence. There were certainly substantial political disagreements among the Guarantor Powers about how best to address the crisis in Cyprus, but, in our study of this conflict, we were unable to find any evidence of Turkey attempting to compel Great Britain militarily, to say nothing of a successful compellent threat made by Turkey against Britain. According to what we believe to be a more accurate recoding, therefore, we argue that a nuclear inferior state has never managed to engage in successful compellence.

Nuclear superior states, on the other hand, have had a much better record of compellent success. Nuclear superior states have used military threats to successfully compel adversaries in ten separate instances since 1945. These ten cases include seven successful compellent threats by nuclear states against nonnuclear states and three successful compellent threats by nuclear superior states against nuclear inferior states. Again, this larger number of successes is despite the fact that the numbers of nuclear inferior and nuclear superior directed dyads are exactly equal.

We now again broaden our perspective to include strictly conventional dyads. We have already seen that nuclear superior states have a better record of success than nuclear inferior states, but do nuclear superior states enjoy higher rates of success than nonnuclear challengers threatening nonnuclear targets? The table shows that there are many cases of compellent success among strictly conventional dyads. Since 1945, nonnuclear states have successfully compelled other nonnuclear states in 15 of 66 attempts for a success rate of 22.7%. When the single (and debatable) case of a nuclear inferior state engaging in successful compellence is added to the ledger, the success rate for non-nuclear-superior states increases to about 23%. This is roughly equivalent to the success rate of nuclear superior states at 20.4%. This is the basic comparison

made by Sechser and Furhmann (2013) when they report that nuclear states are not more likely to achieve compellent success than nonnuclear states.

Yet, this simple comparison does not account for the possibility that nuclear superior states are more likely to achieve compellent success because they are more likely to try. As we saw above, nuclear superior states were much more likely to issue compellent threats and, because of this, their aggregate number of successes relative to the baseline of potential opportunities to engage in compellence is quite high. Nuclear superior states successfully compelled adversaries 10 times in roughly 48,000 possible interactions or once in every 4,800 opportunities. In contrast, the success rate of nuclear inferior states against nuclear superior states is (at best if the single debatable instance of success is included) one in about 48,000. In other words, nuclear superior states are roughly ten times more likely to achieve compellent success than nuclear inferior states. The success rate of nonnuclear states against other nonnuclear states compared to the baseline of possible opportunities is also low. States in this situation have achieved compellent success 15 times in 1.1 million dyad years for a rate of about one in 75,000. The chi-squared statistic indicates that the probability of observing these differences if nuclear superiority has no effect on compellent success is less than 0.000.

Part of this difference might be explained by capacity as many nonnuclear states simply lack the delivery platforms to credibly employ force against some states. Still, this fact is consistent with the central argument of this article that nuclear capabilities enhance a state's ability to engage in international coercion. Moreover, such an explanation cannot account for the drastic difference in success rates between nuclear superior and nuclear-armed, but inferior dyads as the vast majority of the states in a position of nuclear inferiority (including the Soviet Union vis-à-vis the United States during much of the Cold War, China against the Soviet

Union/Russia, and Pakistan against India until recently) possess a clear ability to use force against their nuclear superior opponents. Furthermore, as we will see immediately below, the finding holds even after controlling for capability and geographic distance.

The hypothesized relationship between *Nuclear superiority* and *Success* also finds support in the multivariate regression analysis. To deal with issues of selection, scholars (Puhani 2000, Simmons and Hopkins 2005) advocate the incorporation of factors that may influence the selection and outcome stages into a single equation that models the outcome of interest only. We include, therefore the hypothesized determinants of *Threat initiation* alongside the hypothesized determinants of compellent threats in a single-stage model.[4]

In Table 2, we can see that nuclear superior states are more likely to achieve compellent success; this finding holds in simple bivariate regressions (model 1) and when controlling for other confounding factors (model 2). The sign on the coefficient for *Nuclear superiority* is positive and statistically significant in both models. The relationship is also substantively large. Figure 1 shows that moving from 0 to 1 on the *Nuclear superiority* variable is associated with a more than five-fold increase in the probability of achieving compellent success.

This analysis provides strong empirical backing of Hypothesis 3 and the central argument of this article. Nuclear superior states are more likely to achieve compellent success in part because they are more likely to try. Furthermore, this analysis shows that nuclear inferior states

[4] We do not include *Resolve* as a left-hand side variable in this model because it is perfectly correlated with success among nuclear superior states, providing further support for our argument that nuclear superiority enhances compellent success through its effect on resolve.

rarely if ever achieve compellent success. In dyads involving at least one nuclear-armed state, nuclear superiority is a near necessary condition for successful compellence.

We briefly discuss the control variables. Turning back to Table 2, we can see that, as expected, *Distance*, *Contiguity, Dispute history* are positively correlated with threat initiation. *Dispute history* and *Contiguity* also correlate with *Resolve* and *Success* demonstrating, consistent with the central finding of this article, the factors that determine threat initiation also shape threat conduct and outcomes. *Capability ratio* is negative and statistically significant in model 6, suggesting that conventionally weak challengers are more likely to achieve success. Similar findings have turned up in past studies that utilize the MCT dataset (e.g., Sechser and Furhamann 2013), but defy easy explanation, *Stakes* is positive and statistically significant in models 4 and 6. As expected, the greater the stakes the more willing challengers are to demonstrate resolve and achieve success. The other variables do not reach statistical significance.

As a final test, we consult the list of cases of compellent threats from Fuhrmann and Secsher (2013) to examine how the nuclear balance of power affects the exact same states in different strategic situations. Many nuclear-armed states are inferior in relation to some states, but superior vis-à-vis others. For example, during much of the Cold War, the Soviet Union possessed superiority over China, but not the United States. If our theory is correct, we should expect that these states will be more willing to issue threats against their inferior opponents. Indeed, turning to Table 3, we find that this theoretical expectation is met without exception. The United States issued 15 compellent threats against nonnuclear opponents, two threats against a nuclear inferior Soviet Union, but never once issued a compellent threat against the Soviet Union while Moscow possessed nuclear superiority over Washington. Similarly, the Soviet Union issued two threats against nonnuclear states, three threats against a nuclear-inferior China, and a

threat against nuclear inferior Britain, but zero threats against the nuclear superior United States. India attempted a compellent threat against a nuclear inferior Pakistan in 2001, but never attempted to compel a nuclear superior opponent. Great Britain, France, China, Israel, and South Africa issued 9, 3, 3, 3 and 6 compellent threats against nonnuclear states, respectively, but never once issued a militarized compellent threat against a nuclear superior state. This more detailed analysis provides further support for the hypothesis that nuclear superiority has a powerful effect on patterns of militarized compellent threats.[5]

In sum, the empirical analysis provides strong support for our hypotheses. Nuclear superior states are more likely to issue militarized compellent threats, more likely to demonstrate resolve in compellent threat settings, and more likely to achieve compellent success. Taken together, these findings show that the nuclear balance of power has an important effect on patterns of militarized compellent threats.

Robustness Tests

We conducted a series of additional tests to determine whether the findings depended on any debatable methodological choices. We tried alternate measures of success from Furhmann and Sechser (2013), including coding as successes cases where military force was used but casualties remained under 100 and, additionally, episodes where the target complied only partially with compellent demands. To test for the possibility that the findings were driven by our measure of nuclear capabilities, we included alternate measures, *Nuclear challenger* and *Nuclear difference*.

[5] Since there are zero cases of nuclear-armed but inferior states challenging superior opponents, it is not possible to examine whether superior states are more likely to demonstrate resolve and achieve victory in this set of cases.

To assess whether the findings were being driven by the most powerful states, we reran the analysis after removing the United States and the Soviet Union. In all tests, the core results held.

As we demonstrated above, this analysis improves upon previous research by taking seriously the possibility of strategic selection into threat episodes. One could suggest, however, that there may be another selection threat to inference at work. There may be some lurking factor, let us call it an aggressive national strategic culture, which causes states to pursue nuclear superiority, issue compellent threats, demonstrate resolve, and ultimately prevail over rivals. If this were the case, it is not superiority shaping threat behavior, but the aggressive strategic culture explaining both. This explanation, however, does not square with the evidence. A country's strategic culture is relatively constant, but whether or not it possesses superiority depends on the situational context. As was pointed out above, however, we see empirically that the very same states prove to be more or less aggressive depending on the arsenal size of the adversary. They issue threats against inferior, but not superior, opponents. The nuclear balance of power, not strategic culture, provides the best explanation for the empirical record of compellent threats.

Conclusion

In the 2008 Summer Olympics in Beijing, U.S. swimmer Cullen Jones competed in a single race, the men's 4x100-meter freestyle relay and won a gold medal. Jones was overshadowed in his accomplishment, however, by teammate Michael Phelps who set an Olympic record by competing and winning gold in eight separate swimming events. Both men had the same winning percentage (100%), but one of these performances was clearly much more impressive than the

other. Indeed, Jones's name is forgotten by all but the most diehard swimming fans, while Phelps' legend lives on in the annals of sports history.

These athletes' contrasting experiences help provide insight into contemporary debates about nuclear weapons and international coercion. Recent scholarship has reported that nuclear and nonnuclear states achieve compellent success at roughly equal rates, but this research failed to examine how many compellent threat episodes these states instigated and the aggregate number of successes achieved by each. When this relevant contextual information is brought to bear it is clear that nuclear superior states possess a clear coercive advantage over their nuclear inferior competitors. This article found that states in a position of nuclear superiority are more likely to issue compellent threats, to demonstrate resolve in compellent threat episodes, and to achieve compellent success. To account for these findings, we provided an explanation, drawing on recent international relations scholarship, that suggests that the nuclear balance of power influences a state's level of effective resolve, shaping its willingness to initiate and escalate crises and, in turn, its prospects for coercive success. The findings of this article contribute, therefore, to a growing body of literature (Beardsley and Asal 2009; Kroenig 2013; Narang 2014) that claims that nuclear weapons matter for international coercion.

The findings and argument of this article also suggest that the effect of nuclear weapons on compellence may be more subtle than recognized in previous analyses. Scholars such as Fuhrmann and Sechser (2013) are rightly dismissive of the idea that the threat of intentional nuclear annihilation is credible. As a commentator in a recent online debate on this subject posted, "Perhaps no one actually believes, 'We will burn you all alive if you do not all comply!!'" (Marshall 2013). These simplistic arguments overlook the fact, however, that states can exert coercive pressure short of threatening an intentional nuclear attack, by gradually raising

the risk of war through the initiation and escalation of international crises (Schelling 1966). The argument of this article suggests that nuclear superior states are more likely to achieve compellent success because they are more willing to run these risks.

The findings of this article are not only central to recent scholarly debates about international coercion, but they also have clear implications for ongoing policy debates about nuclear force sizing, arms control, and arms races (Kydd 2000). Should the United States continue, as President John F. Kennedy promised, to maintain a nuclear arsenal "second to none?" Will Russia continue to invest heavily in modernizing all legs of its strategic nuclear triad? Will China's ongoing nuclear modernization plans eventually result in a sprint to parity with the United States and Russia? Will India and Pakistan continue their intense nuclear arms race in South Asia? Many scholars dismiss the quests for nuclear superiority between rivals as "illogical" (Jervis 1984). They argue that as long as a state has a secure nuclear retaliatory capability, then any additional improvements to nuclear forces are unnecessary and dangerous "overkill" (Rosenberg 1983). The findings of this article suggest a different answer. Nuclear superiority has been a near necessary condition for successful compellence in dyads involving at least one nuclear power. The pursuit and maintenance of superiority over nuclear-armed rivals, therefore, appears to be a reasonable approach for states that want to at least keep open the option of compelling potential adversaries.

These findings also have implications for our understanding of the spread of nuclear weapons to additional states. According to one school of thought, nuclear pursuit is costly and results in little strategic benefit to their possessors. Therefore, these scholars invoke other considerations, such as inward-looking domestic political regimes (Solingen 2007) or the psychology of individual leaders (Hymans 2006) to explain an otherwise suboptimal policy

choice. Others (e.g, Gartzke and Kroenig 2009) argue that proliferators are incentivized by the very real strategic benefits that nuclear weapons provide, including less intense conflicts (Rauchhaus 2009), an increased probability of winning disputes (Beardsley and Asal 2009, Kroenig 2013), and enhanced international influence (Gartzke and Jo 2009). This article suggests that the freedom from compellence by previously superior opponents and the leverage to compel inferior rivals can be tallied among the strategic benefits incentivizing states down the nuclear path.

At the time of writing, the international community and Iran were engaged in negotiations over Tehran's advanced nuclear program and experts debated whether Washington could live with a nuclear-armed Iran. Fuhrmann and Sechser (2013) argue that the international community should be sanguine about the effects of nuclear weapons in Iran because it is unlikely that Iran will be able to use nuclear weapons to successfully compel other states. This article shows, however, that nuclear-armed states frequently attempt to compel nonnuclear states and a future nuclear-armed Iran could be emboldened to make similar threats, creating dangerous crisis dynamics even if Tehran's attempts to brandish nuclear weapons are ultimately unsuccessful. Moreover, the findings of this article suggest that a nuclear Iran will often be successful in its attempts to compel regional nonnuclear states, many of whom are U.S. allies and partners, because it will be more willing to try once it possesses a nuclear advantage. Furthermore, compellent threat episodes involving a nuclear-armed Iran will contain at least some nonzero risk of nuclear catastrophe, a threat that does not exist at all at present. These implications suggest that the international community is justified in its prioritization of nuclear nonproliferation in Iran. At the broadest level, therefore, the most important takeaway of this research might simply

be that there remains very good reason to support the international community's attempts to stop the spread of the world's most dangerous weapons.

References

Achen, Christopher H. 2005. "Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong." *Conflict Management and Peace Science* 22: 327–339.

Beardsley, Kyle, and Victor Asal. 2009. "Winning with the Bomb." *Journal of Conflict Resolution* 53, 2: 278-301.

Bell, Mark S. and Nicholas L. Miller. N.D. "Questioning the Effect of Nuclear Weapons on Conflict." *Journal of Conflict Resolution*. Forthcoming.

Bennett, D. Scott, and Allan Stam. 2000. "EUGene: A Conceptual Manual." *International Interactions* 26: 179-204.

Brodie, Bernard. 1946. *The Absolute Weapon*. New York: Harcourt.

Boulding, Kenneth E. 1962. *Conflict and Defense: A General Theory*. New York: Harper and Brothers.

Carter, David B., and Curtis S. Signorino. 2010. "Back to the Future: Modeling Time Dependence in Binary Data." *Political Analysis* 18, 3: 271-292.

Fearon, James D. 1994. "Domestic Political Audiences and the Escalation of International Disputes." *American Political Science Review* 88, 3: 577-592.

Fearon, James D. 1997. "Signaling Foreign Policy Interests: Tying Hands versus Sinking Costs." *Journal of Conflict Resolution* 41, 1: 68-90.

Gartzke, Erik. 2007. "The Capitalist Peace." *American Journal of Political Science*. 51, 1: 166-191.

Gartzke, Erik, and Dong-Joon Jo. 2009. "Bargaining, Nuclear Proliferation, and Interstate Disputes." *Journal of Conflict Resolution* 53, no. 2 (April): 209-233.

Gartzke, Erik, and Matthew Kroenig. 2009. "A Strategic Approach to Nuclear Proliferation," *Journal of Conflict Resolution*, 53, 2: 151-160.

Gartzke, Erik, and Matthew Kroenig. 2014. "Nuclear Posture, Nonproliferation Policy, and the Spread of Nuclear Weapons," (with Erik Gartzke) *Journal of Conflict Resolution*, 58, 3: 395-401.

Hymans, Jacques. 2006. *The Psychology of Nuclear Proliferation: Identity, Emotions, and Foreign Policy.* Cambridge: Cambridge University Press.

Jaggers, Keith, and Ted Robert Gurr. 1995. "Tracking Democracy's Third Wave with the

Polity III Data." *Journal of Peace Research* 32, 4: 469–82.

Jervis, Robert. 1984. *The Illogic of American Nuclear Strategy*. Ithaca, NY: Cornell University Press.

Jervis, Robert. 1989. *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon*. Ithaca, NY: Cornell University Press.

Kissinger, Henry. 1957. *Nuclear Weapons and Foreign Policy*. New York: Council on Foreign Relations.

Kroc, Ray. 1992. *Grinding it Out: The Making of McDonald's*. New York: St. Martin's Press.

Kroenig, Matthew. 2013a. "Nuclear Superiority and the Balance of Resolve: Explaining Nuclear Crisis Outcomes." *International Organization*, 67, 1: 141-171.

Kroenig, Matthew. 2013b. "Debating the Benefits of Nuclear Superiority." The Duck of Minerva, March 25, available at http://www.whiteoliphaunt.com/duckofminerva/2013/03/debating-the-benefits-nuclear-superiority-for-crisis-bargaining-part-i.html.

Kydd, Andrew. 2000. "Arms Races and Arms Control: Modeling the Hawk Perspective." *American Journal of Political Science* 44, 2: 222-238.

Mallinson, William. 2005. *Cyprus: A Modern History*. New York: I. B. Tauris.

Marshall, Edward. 2013. Comment on "Debating the Benefits of Nuclear Superiority for Crisis Bargaining," The Duck of Minerva, March 25, available at http://www.whiteoliphaunt.com/duckofminerva/2013/03/debating-the-benefits-nuclear-superiority-for-crisis-bargaining-part-i.html.

Narang, Vipin. 2014. *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict*. Princeton, NJ: Princeton University Press.

Oneal, John R., and Bruce M. Russett. 1997. "The Classical Liberals Were Right: Democracy, Interdependence, and Conflict, 1950-85." *International Studies Quarterly* 41, 2: 267-93.

Powell, Robert. 1990. *Nuclear Deterrence Theory: The Search for Credibility*. Cambridge, MA: Cambridge University Press.

Puhani, Patrick A. 2000. "The Heckman Correction for Sample Selection and Its Critique." *Journal of Economic Surveys* 14, 1: 53–68.

Rosenberg, David Alan. 1983. "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960." *International Security* 7, 4: 3-71.

Rauchhaus, Robert. 2009. "Evaluating the Nuclear Peace Hypothesis: A Quantitative Approach." *Journal of Conflict Resolution* 53, 2: 258-277.

Sartori, Anne E. 2003. "An Estimator for Some Binary Outcome Selection Models without Exclusion Restrictions." *Political Analysis* 11: 111-138.

Sagan, Scott. 1996/1997. "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb." *International Security* 21, 3: 54-86.

Schelling, Thomas. 1960. *The Strategy of Conflict*. Cambridge: Harvard University Press.

Schelling, Thomas. 1966. *Arms and Influence*. New Haven: Yale University Press.

Sechser, Todd S. "Militarized Compellent Threats, 1918-2001." *Conflict Management and Peace Science* 28,4: 377-401.

Sechser, Todd S. and Matthew Fuhrmann. 2013. "Crisis Bargaining and Nuclear Blackmail." *International Organization*, 67, 1:173-195.

Simmons, Beth A., and Daniel J. Hopkins. 2005. "The Constraining Power of International Treaties: Theory and Methods." *American Political Science Review* 99-4: 623–31.

Slantchev, Branislav. 2005. "Military Coercion in Interstate Crises." *American Political Science Review* 99, 4: 533-547.

Solingen, Etel. 2007. *Nuclear Logics: Contrasting Paths in East Asia and the Middle East*. Princeton: Princeton University Press.

Tomz, Michael, Jason Wittenberg, and Gary King. 2003. "Clarify: Software for Interpreting and Presenting Statistical Results." *Journal of Statistical Software* 8, 1.

Table 1. The Nuclear Balance and Militarized Compellent Threats, 1945-2001.

Directed Dyad Type *(Challenger – Target)*	**Success**	**Failure**	**Attempts**	**Directed Dyads**
Nuclear Inferior				
Non-Nuclear – Nuclear	1	2	3	46,224
Nuclear Inferior – Nuclear Superior	0	0	0	847
Total	*1*	*2*	*3*	*47,077*
Nuclear Superior				
Nuclear – Non-Nuclear	7	35	42	46,224
Nuclear Superior – Nuclear Inferior	3	4	7	847
Total	*10*	*39*	*49*	*47,074*
Strictly Conventional				
Non-Nuclear – Non-Nuclear	15	51	66	1,073,681
Total	*15*	*51*	*66*	*1,073,681*

Table 2. Probit Regressions of Militarized Compellence Threats, 1945 to 2001

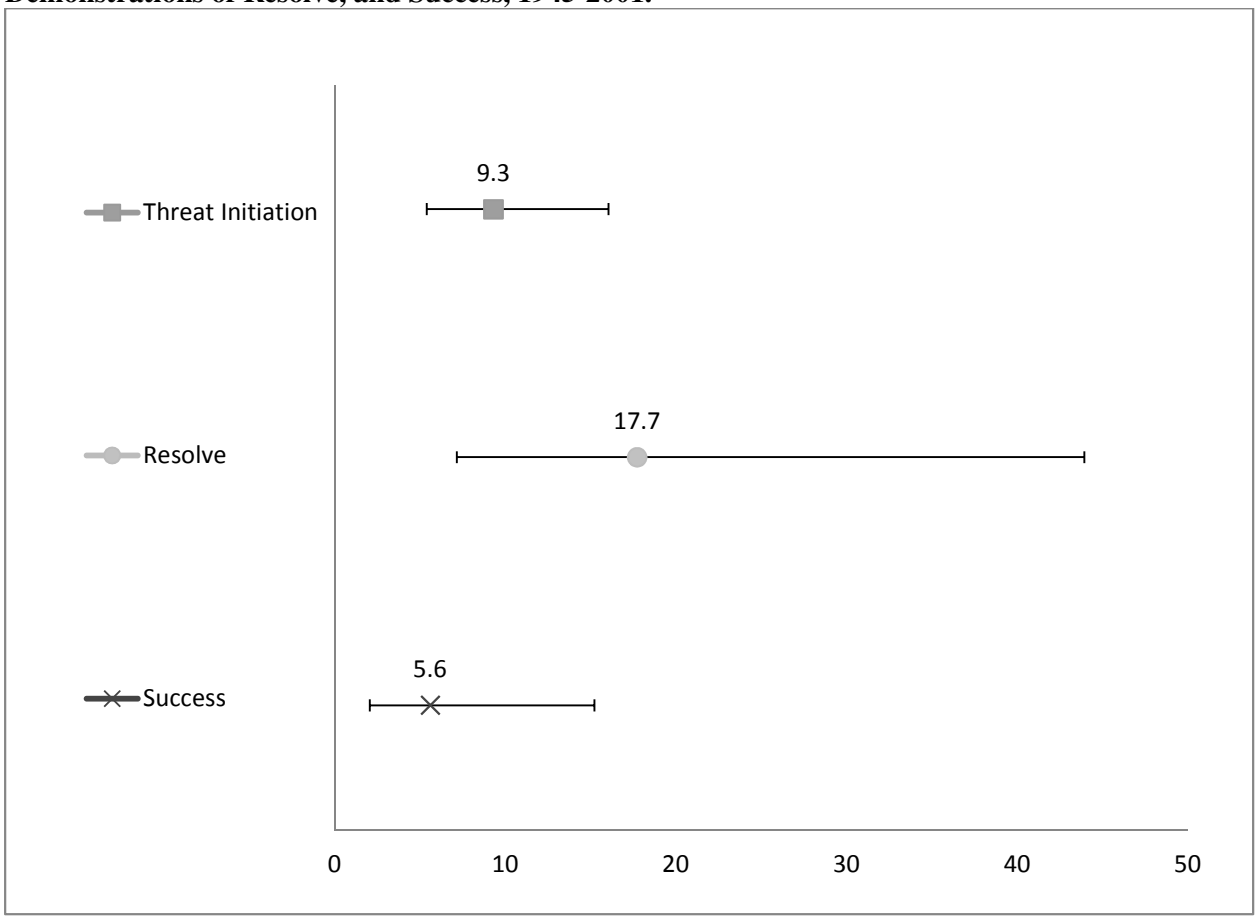
	(1)	(2)	(3)	(4)	(5)	(6)
	Threat Initiation	Threat Initiation	Resolve	Resolve	Success	Success
Superiority	0.783*** (0.067)	0.719*** (0.077)	0.795*** (0.071)	0.783*** (0.112)	0.661*** (0.111)	0.451*** (0.128)
Capabilities		-0.00005 0.0002		-0.0001 (0.0003)		-0.016* (0.009)
Dispute History		0.042*** (0.006)		0.036*** (0.007)		0.025* (0.014)
Joint Democracy		-0.245 0.144		-0.061 (0.211)		0.205 (0.215)
Distance		-0.0008*** (0.0003)		-0.00001 (0.00003)		-0.00006 (0.00004)
Contiguity		0.699*** (0.103)		0.769*** (0.150)		0.649*** (0.195)
Stakes				4.638*** (0.215)		3.181*** (0.201)
Constant	-3.694*** (2.072)	-3.559*** (0.129)	-3.851*** (0.087)	-4.484*** (0.225)	-4.260*** (0.164)	-4.689*** (0.275)
N	1,167,829	1,068,348	1,167,829	1,068,348	1,167,829	1,068,348
pseudo R^2	0.070	0.258	0.076	0.715	0.061	0.559

Note: Robust standard errors are in parentheses. *p<0.10 **p<0.05 ***p<0.01 for two-tailed tests. Models are estimated with t, t^2, and t^3 as recommended by Carter and Signorino (2010).

Table 3. List of Compellent Threats by Nuclear-Armed States, 1945-2001

Country	Threats against Nuclear Superior States	Threats against Nuclear Inferior States
United States	0	17
Soviet Union	0	7
Great Britain	0	9
France	0	3
China	0	3
Israel	0	3
South Africa	0	6
India	0	1
Pakistan	0	0
Total	**0**	**49**

Figure 1. The Substantive Effect of Nuclear Superiority on Compellent Threat Initiation, Demonstrations of Resolve, and Success, 1945-2001.



Note: Point estimates are odds ratios with 95% confidence intervals represented by the error bars. Substantive estimates for threat, resolve, and success are taken from Table 2, models 2, 4, and 6, respectively.