Playing to the Audience: Responses to Violations of International Order

Muhammet A. Bas Andrew J. Coe Eliza Gheorghe*

Abstract

When international laws or norms are violated, an enforcer can punish the violator, offer concessions for its renewed compliance, or tolerate it. Punishment is often costlier than concessions or toleration, but signals to other states that violation will be met with penalties rather than rewards or acceptance. By influencing other states' expectations about what will happen if they get caught violating, the choice of response can thus encourage or discourage subsequent compliance. Anticipating this, an enforcer is more willing to punish when it faces a larger audience of potential near-term violators. Focusing on the nuclear nonproliferation norm, we show statistically that enforcer responses appear to have affected whether states subsequently pursued the bomb historically, and that this effect is stronger than other hypothesized determinants of proliferation decisions. We also use primary sources to document that policymakers recognized and heeded this influence in a range of cases.

Word Count: 10,057

*We thank Asuman Bilir, Elyse Burns, Dominic Bustillos, Gabrielle Gerbus, Rawan Hammoud, Shahriyar Huseynli, Volkan İmamoğlu, Renata Ivanova, Yury Katliarou, Aydın Khajei, Dilan Koç, Michalina Kubicka, Muhammet Furkan Küçükmeral, Taylan Paksoy, Evgeniia Shahin, Şükrü Kağan Sürücü, Widy Susanto, Nurzhan Tustikbay, Bilgehan Salih Uyhan for superb assistance with this research. We thank Mark Bell, Malfrid Braut-Hegghammer, Mariana Budjeryn, Rebecca Gibbons, Or Rabinowitz, and Tristan Volpe for help with sources for particular cases.

How is international order enforced? Facing a state that has acted in violation of international law, norms, or the expectations of powerful actors in the international community, an enforcing state or international organization could impose a penalty, offer a reward for renewed compliance, or ignore it altogether. A reward would make both sides better off than a penalty and end the violation, so why would an enforcer ever resort to penalties?[1] How does the character of enforcement affect subsequent compliance?

These questions are of central importance in a variety of realms of international order. Should a member of the European Union violating liberal norms be cast out, offered special incentives to desist, or ignored? Is it better to enforce human rights conventions by trying and convicting dictators who have committed atrocities or by offering them comfortable exile? Should states suspected of pursuing nuclear weapons be sanctioned and attacked or instead bribed to halt their programs?

We analyze a model of the interactions between a set of states that might violate international order and an enforcer that might use rewards or penalties to stop them. In equilibrium, states' choices of whether to violate depend on their expectations of how the enforcer will respond if they are discovered. These expectations are determined by the enforcer's past history of responses: a history of penalties discourages violation, while a history of rewards or acceptance encourages it. Anticipating this influence, the enforcer weighs the immediate, higher cost of using penalties rather than rewards against the subsequent benefit of deterring other states' violations. The larger the audience of potential near-term violators, the more likely that the enforcer resorts to punishment.

We apply our theory to the context of nuclear proliferation. The pursuit of nuclear

[1] We will explain subsequently why a reward would have these properties.

weapons is a very high-stakes violation of international order. Proliferants gamble on the jackpot of becoming a recognized nuclear power but risk a devastating response if their program is discovered before it succeeds. For a state like Iran considering this wager, it is crucial to know: if discovered to be on the verge of success, would the US attack, offer a deal, or tolerate it? The US has done some of each historically, with radically different consequences for the violator.

Because violating the nonproliferation norm can lead to such drastically varying responses, it should be an easy context in which to observe the operation of our theory. Any state that might pursue nuclear weapons should keenly observe and be influenced by enforcers' responses to other violators, and an enforcer should carefully consider this influence when deciding how to respond to a discovered proliferant.

We first test our model's predictions in a statistical analysis of the historical record of nuclear weapons programs and responses to them. We show that deals to stop, and toleration of, proliferation encouraged other states to pursue nuclear weapons, while attacks discouraged them from doing so. We also demonstrate indirectly that the presence of a larger audience of potential near-term proliferants pushed enforcers toward attacking rather than making a deal. Finally, we show that the effect of past treatment of nuclear programs is stronger than those of other variables previously theorized to drive attempts at proliferation. It thus appears that enforcers' behavior is a potent determinant of whether states seek the bomb.

We then use case studies, drawing on archival and secondary sources, to provide evidence for the mechanisms through which enforcers' actions against proliferants influence the audience. We show that the leadership in potential proliferants drew conclusions about

how they would be treated based on how they saw enforcers treat others. We also demonstrate that policymakers in enforcer states understood that their choice of response would be influential to an audience and took into account its expected reaction when making decisions about nonproliferation policy.

The idea that a powerful actor punishes another in order to deter others from unwanted behavior has been used to explain why governments resist separatist movements (Walter, 2006) as well as why sanctions may be more potent than is indicated by their effect on targeted states (Miller, 2014*b*). However, these studies do not consider the choice between punishing noncompliance or rewarding compliance. Scholars of international law also emphasize the role of a variety of means of penalizing noncompliance in enforcing international laws and norms (Guzman, 2008), but have only recently begun to consider the role of rewards (van Aaken and Simsek, 2021). Scholars of coercive diplomacy have long recognized the possibility of either carrots or sticks being used to elicit compliance, but have focused mostly on the cost-effectiveness of each as an instrument for affecting the behavior of the current violator (Bernauer and Ruloff, 1999; Drezner, 1999; Jentleson and Whytock, 2005; Nincic, 2010) and how domestic politics (Milner and Tingley, 2015) or hold-up problems (Carnegie, 2015) affect the enforcer's choice of instruments. By contrast, we consider the choice an enforcer makes between carrots and sticks, the effect this choice has on other potential violators, and how the latter influences the former.

Closer to our own mechanism, Carnegie and Carson (2018) consider the choice an enforcer makes between publicizing or concealing a state's violation. As in our theory, this choice is driven by the anticipated reaction of an audience to a revealed violation. Our analysis complements theirs by showing how the same concern influences the choice not

only of whether to publicize, but also of how to respond to, a violation.

Our study helps to fill an important gap in theorizing about nuclear proliferation. Prior works explain why nuclear weapons programs sometimes lead to preventive attacks (Benson and Wen, 2011; Debs and Monteiro, 2014); how this depends on the progress of a program and intelligence estimates thereof (Bas and Coe, 2012, 2016); and the viability, content, and timing of deals to stop a program (Bas and Coe, 2018; Coe, 2018; Coe and Vaynman, 2020; Spaniel, 2015). However, none of these specify why enforcers resort to attack in some cases but make a deal in others. Moreover, all of these analyze a purely bilateral context: an enforcer faces a lone proliferant, and neither has any potential to influence or be influenced by interactions with other states. By contrast, Coe and Vaynman (2015), Gavin (2015), and Miller (2014*a*) analyze a context with multiple proliferants and show that an enforcer is motivated to stop attempted proliferation by the influence this will have on future proliferation. Miller (2014*b*) argues that potential proliferants are deterred when they expect they will face sanctions for pursuing the bomb. But none of these considers the tradeoff an enforcer faces in deciding *how* to respond to attempted proliferation.

Our research theorizes and documents a novel channel by which one proliferant can influence others. We set aside the previously-recognized possibilities that one state's proliferation might increase another's insecurity (Bleek, 2010) or provide a source of assistance with weapons-relevant nuclear technology (Kroenig, 2009), either of which might increase other states' likelihood of seeking nuclear weapons. Instead we focus on how an enforcer's use of force or diplomacy in response to a proliferant's program can influence other states' desires to invest in programs.

Theory

We proceed to setup a simple model of the interaction between a set of states that might violate international order—which we refer to as masculine "potential violators"—and another state that would like to stop them from doing so—a feminine "enforcer." The model allows us to clarify how the potential violators' behavior depends on the past actions of the enforcer, and how this affects the enforcer's decision-making.

In each of infinite rounds, a set of N states each simultaneously choose whether to violate. If a potential violator does not, then he receives a payoff of zero. For each state that does, Nature independently and randomly determines whether an enforcer E has the chance to respond, with probability τ, or not, with probability $1-\tau$. We term a violator that is subject to a response a "threatened violator" and one that is not an "unthreatened violator." E then simultaneously chooses among penalizing, rewarding, or tolerating each threatened violator, but has no choice except to tolerate each unthreatened violator. If she punishes a particular threatened violator, his turn ends with him receiving $-p_V < 0$ and her getting $-p_E < 0$. If she instead employs rewards, his turn ends with him getting $r > 0$ and her receiving $-r$. A tolerated violator gets away with it, with a payoff of $s > 0$ for him and of $-s$ for the enforcer, and ceases to play in subsequent rounds. We assume that $-p_V < r < p_E < s$. Payoffs in future rounds are discounted by $\delta \in (0,1)$.

Consider the model's features. If a state undertakes a violation, it may never be responded to by another state (with probability $1-\tau$). This could occur in either of two ways. First, the enforcer might not detect that a state is violating the norm, so that the violator is able to proceed unmolested. Second, the enforcer might detect that the time for intervention is ripe, but then realize that the violator is too strong or too important for

the enforcer to credibly and successfully intervene to stop it. This happened, for example, when the US balked at the prohibitive costs of attacking China's nuclear weapons program and at the consequences for the larger Cold War of abandoning Pakistan over its program. If instead the violator is both caught in time and weak and expendable enough that intervention is cost-effective (with probability τ), then the enforcer will be able to respond, with punishment, reward, or toleration. Think here of the US toleration of India, attack on Iraq, and deal with Libya over their programs.

Punishment consists of diplomatic outcasting, the imposition of economic sanctions, or military intervention, and so is assumed to be costly for both sides. Rewarding comes from a deal in which the enforcer pays the violator to cease. Because punishment is costly for both sides, we assume there is always a deal that would leave both strictly better off, simply by distributing the surplus from avoiding costly punishment.[2] Thus, making a deal is "cheaper" for the enforcer than punishing ($r < p_E$) and better for the violator than being punished ($r > -p_V$), though not as good as a successful violation ($s > r$). We also assume that the enforcer prefers punishing to tolerating violation ($p_E < s$), but we can interpret instances in which a violator goes unthreatened (which occur with probability $1 - \tau$) as including some where the enforcer would rather allow the violation to occur than do anything to stop it (so that, in these instances, $s < p_E$).[3]

We assume that both punishment and reward stop the violation at least temporarily.

[2]In effect, we are assuming the conclusion of Fearon (1995): absent some reason for bargaining failure, there is always some settlement (in our model, a deal entailing some transfer of utility r) that leaves both sides better off than war (in our model, punishment).

[3]These same preferences arise endogenously in previous work that explicitly models bilateral bargaining over a weapons program, such as Bas and Coe (2018). We abstract away from this bargaining in order to focus on the effect of the audience.

A reward entails a deal requiring the violator to stop in order to receive the reward, but the violator could always renege on the deal at the next opportunity. Punishment might halt violation, as when a nuclear weapons program's facilities are bombed, but the violator could always resume its program subsequently.[4] Toleration entails the state being allowed to continue in its violation.

The model assumes that whatever one potential violator does, and however the enforcer responds to it, there are no direct consequences for any other state. Obviously this is not always true empirically. States that got nuclear weapons sometimes proceeded to transfer nuclear technology, materials, or expertise to other states, making it cheaper and easier for those states' nuclear programs to succeed. One state's proliferation can also undermine the security of neighboring rivals, increasing their motivation to seek nuclear weapons. We assume direct consequences like these away in order to isolate an *indirect* channel by which an enforcer's response to one violator can influence subsequent states' behavior: via their expectations about how the enforcer would respond to their own attempts.

Proposition 1. *There is always an equilibrium in which every potential violator violates the norm, and the enforcer, if given the chance to intervene, always uses rewards.*[5]

Intuitively, if every potential violator is going to do it no matter what, then the enforcer should just choose the best response to each individual violator it faces. Because making a deal is cheaper than punishing and better for the enforcer than toleration, the enforcer

[4]Some punishments might instead have no effect on violation, and simply impose a cost on the violator. Incorporating this possibility does not change the results qualitatively, because it only sharpens the tradeoff between the immediate downside of punishment (it not only costs the enforcer but also might not stop violation) and its long-term benefit (it discourages other potential violators).

[5]"Equilibrium" means subgame-perfect Nash equilibrium. Proofs are in the appendix.

always makes a deal. From a potential violator's prospective, choosing to violate is therefore expected to lead either to success or to a deal with the enforcer. Either way, he is better off violating than not.

If the enforcer is ever to punish violation, it must be because she expects that doing so will influence subsequent behavior. This is also possible in equilibrium.

Proposition 2. *If and only if* $\tau s \leq (1-\tau)p_V$ *and* $p_E - r \leq \frac{\delta}{1-(1-\tau)\delta} N(\tau s + (1-\tau)r)$, *there is an equilibrium in which, as long as the enforcer has always punished a violator, no potential violator will attempt it and the enforcer would punish any threatened violator that did so alone. If any violator receives a reward or is tolerated, all subsequently violate and the enforcer only uses rewards when intervening.*

In this equilibrium, so long as violation has met with penalties in the past, each state expects that, if he breaks the norm, he will likely be punished. He therefore refrains so long as the risk of punishment ($(1-\tau)p_V$) outweighs the expected benefit of successful violation (τs). If some past violator instead received a reward or succeeded, then other states expect that attempted violation will result in either a reward or success, motivating them to attempt it. Thus, states' behavior depends on their *expectations* about how the enforcer will respond, which they form based on her past responses.[6]

In deciding whether to penalize or reward a violator, the enforcer must consider both

[6]Violation, punishment, and reward all occur off the equilibrium path. The online appendix contains an alternative model in which potential violators are uncertain about the enforcer's cost of punishment, which can change over time, and must infer it based on observing her responses to violation. Equilibrium play features phases in which violations occur and are met with reward or toleration, ended with punishment that leads to a phase of no violation. The intuitions for behavior and observable implications of this more realistic but also more complex model are the same as those presented here.

the immediate cost of her response and its influence on other states' expectations. The former argues for her rewarding, because it is cheaper ($r < p_E$). The latter argues for her penalizing, because by doing so she preserves expectations that any discovered violation will be met with punishment and thereby deters others from attempting it. Punishing is rational so long as its immediate higher cost ($p_E - r$) is outweighed by the benefit of deterring potential violators from subsequently attempting it, which would result either in success or a deal ($\delta N(\tau s + (1-\tau)r)$).

Obviously, the worse successful violation or a deal would be for the enforcer (i.e., the lower is $-s$ or $-r$), or the less costly punishment would be (that is, the lower is p_E), the more likely it is that the enforcer will penalize rather than reward. Doing so is cheaper and averts worse outcomes for the enforcer. The more likely any violator is to be unthreatened (higher τ), the more likely the enforcer is to penalize, since future attempts at violation are likelier to succeed. However, this also makes it more difficult to use the threat of penalty to stop attempts, as the potential violator is less likely to be deterred from trying.

Crucially, the willingness of the enforcer to punish also depends on what we term the "audience": how many potential violators are there to be influenced by the enforcer's choice, and how soon might they violate? The more such states there are (greater N), the greater is the number of potential future attempts at violation that the enforcer's decision today will influence.[7] This makes it more important to pay the cost of punishment now in order to avoid the cost of more rewards or successful violations occurring later. Second, the

[7]The N states influenced by a given response can be interpreted as the subset of states that perceive the response to the current violator as indicative of how their own violation would be treated. If, for instance, the current violator is an adversary of the enforcer, other adversaries may expect be treated the same, while the enforcer's allies might only be influenced by how the enforcer responds to an ally violating.

closer states' incipient or ongoing violations are to succeeding (which can be interpreted as higher δ), the more immediate is the threat of future attempts at violation. This also tilts the enforcer's tradeoff in favor of punishment.

These results yield clear observable implications for the behavior of both potential violators and enforcers. The occurrence of a penalty on, reward for, or toleration of some violator should alter states' expectations about what will happen if they subsequently try it. In turn, these expectations should affect their willingness to do so.

Hypothesis 1. *Toleration of a violation encourages other potential violators to attempt it.*

Hypothesis 2. *Punishment of a violation discourages other potential violators.*

Hypothesis 3. *Rewarding a violation encourages other potential violators.*

Knowing that the choice of penalty or reward might alter the expectations and therefore behavior of other states, enforcers should condition their choice on the size of the audience that might be thereby influenced and quickly violate the norm.

Hypothesis 4. *If there is no audience of potential near-term violators, an enforcer should make a deal with the violator at hand. The larger the audience, the more hesitant an enforcer will be to deal rather than punish.*

The most obvious way to test this last hypothesis requires that we identify the perceived "audience of potential near-term violators" for some aspect of international order. This is difficult to do across many states and years for a statistical analysis. The audience may not include all states, but it is surely larger than the subset of states that have ever violated, or even seriously considered violating, the norm in question. For example, countries that lack

the budgetary or technological means to pursue nuclear weapons are unable to violate the norm of nonproliferation. They cannot be influenced by enforcers' responses to nuclear programs, and so are not members of the audience. But the audience for this norm is more than just the subset of states that ever demonstrated a serious interest in nuclear weapons. The audience also includes all those states that did not, *but would have* had enforcers more often chosen toleration or rewards in response to others' programs.

Because we lack a large-n measure of the audience, we will test Hypothesis 4 indirectly in our statistical analysis. We will analyze the proliferation decisions of a set of M states that is over-inclusive: it includes the audience but also other states that were never going to pursue nuclear weapons no matter what any enforcer did, so that $M \geq N$. When N is relatively large, the average influence over the $M \approx N$ states we examine should also be relatively large, and thus so should the effect size we find if our theory is correct. By contrast, when N is relatively small, the average influence of an enforcer's decision over the $M \gg N$ states we examine should be diluted by all the states who are not in the audience and thus not influenceable by definition. Because enforcers are more likely to make deals when N is smaller and to punish when it is larger, we have the following.

Hypothesis 4'. *The estimated effect of punishment on states' violations should be larger in magnitude than that of deals.*

Linking Pursuit of Nuclear Weapons to Enforcer Responses

Of the many concerns of international order, stopping the spread of nuclear weapons may be among the most important. The enforcement of nonproliferation has varied dramatically in its consequences for both violators and enforcers, ranging from invasion and

regime change at one extreme to security guarantees and formal alliances at the other. Precisely because such drastic outcomes can occur, potential violators should be strongly influenced by past enforcement, and enforcers should weigh this influence heavily in deciding how to respond. Nuclear nonproliferation thus offers a promising arena in which to observe our theory at work.

We resort first to a quantitative analysis of the empirical record to establish that enforcers' responses to nuclear programs are correlated with states' subsequent nuclear activity in the ways our theory predicts. We also compare the strength of this determinant of proliferation to others established by prior research. We then examine qualitative evidence on all the states that explored or pursued a nuclear weapons program to show that policy-makers recognized and were influenced by the mechanisms posited by our theory.

For the statistical analysis, our universe of cases is the set of country-years in which each country does not yet have nuclear weapons but is currently exploring or pursuing them or might plausibly begin to do so. We operationalize this as all country-years that manifested some interest in nuclear technology, in the form of either an atomic energy commission or a nuclear physics/chemistry department in a higher education institution, from 1939 to 2018.[8]

Our dependent variable is the change in a state's interest in seeking nuclear weapons. We assemble seven observable indicators of changed interest from Bleek (2017).[9] *Explore*

[8]Our results are robust to instead including *all* countries in the analysis. We thank Eliza Gheorghe for sharing this dataset with us.

[9]We made six revisions to this data: we code India as acquiring nuclear capability in 1974, since as we document this was perceived by other countries as acquiring nuclear weapon capability; Iran as stopping from 2003 to 2005 and 2015 to 2018 and North Korea in 1994, when both appear to have complied temporarily with nonproliferation deals; Syria as exploring starting in 1997, based on US intelligence estimates; and Ukraine as exploring

and *Pursue* are dichotomous variables that capture the onset of exploration and pursuit of nuclear weapons. *Program* marks the onset of either exploration or pursuit, whichever comes first. *End* marks the year in which a state terminates pursuit or exploration. *Accelerate* records a change either from no interest to exploration or pursuit, or from exploration to pursuit. *Decelerate* captures program termination or a transition from pursuit to exploration. Finally, *Status Change* is -1 when there is deceleration, 1 when there is acceleration, and 0 when there is no change in activity from the previous year.

Our independent variables encode the recent history of responses by enforcers to other proliferants. We operationalize "recent" to mean within the last five years.[10] For each state-year, *Attack* records how many other states suffered a preventive attack on their nuclear program within the previous five years, using data from Bas and Coe (2016).[11] *Deal* records how many other states made a late-stage nonproliferation deal in that window, using data from Bas and Coe (2018).[12] Finally, *Toleration* marks how many other states acquired nuclear weapons in the window.[13]

We do not incorporate economic sanctions as a punishment because previous work has already demonstrated that the expectation of suffering sanctions discourages states from pursuing nuclear weapons (Miller, 2014*b*). Miller argues that nonproliferation sanctions were not expected (and never imposed) before 1975, but from 1976 on were consistently expected due to US legislation that mandated their imposition. Because almost all the attacks and deals we observe also occurred after 1975, the effect we estimate for either could

from 1991 to 1994, based on Budjeryn (2016).

[10]Our results are robust to instead using the past three or four years.

[11]We added the assassination and cyber attacks on Iran's program from 2010 to 2012.

[12]We added the late-stage deal between the US and West Germany in 1969.

[13]Qualitatively similar results obtain if we instead use dummy variables that record whether an attack, deal, or toleration (respectively) occurred in the window.

be biased downward by the effect of the simultaneous increased expectation of sanctions. Additionally, before 1976 states that got nuclear weapons were not subsequently sanctioned; from 1976 on, they generally were. This might bias the estimated effect of toleration, which is concentrated before 1976. To address these issues, we will examine how our estimates change when only the years from 1976 on are included in the analysis. Similar concerns about system-wide changes and temporal dependence lead us also to check the estimates on just the period during which the nonproliferation regime was established (after 1969) and on just the period in which all states knew that nuclear weapons were technologically feasible (from 1945 on).

Table 1 reports the number of program accelerations and decelerations that occurred within the subsequent five years of each response type, for the whole nuclear era as well as each of the periods discussed above. We also report the counts we would expect to see if the response type is in fact unrelated to nuclear program activity. We use binomial tests to determine p-values: how likely a count as favorable to our theory as the one we actually observe is to arise by chance, if responses and activity are independent of each other.

Toleration and attack are each strongly associated with changes in nuclear program activity, statistically and substantively, though this weakens in the period after 1976. As H1 and H2 predict, tolerations appear to encourage acceleration, while attacks appear to discourage it. Neither is associated in the direction the theory expects with deceleration. Deals are associated with decelerations in activity, and with acceleration from 1969 on, both in the direction H3 predicts: deals appear to encourage acceleration and discourage deceleration. However, they are not associated with accelerations in the direction the theory predicts for the periods that include the early years of the nuclear era.

Table 1: Changes in Nuclear Weapons Program Following Enforcer Responses

	1939–2018		**1945–2018**		**1969–2018**		**1976–2018**	
In the five years after a:	Accel (of 54)	Decel (of 25)	Accel (of 46)	Decel (of 25)	Accel (of 24)	Decel (of 19)	Accel (of 13)	Decel (of 15)
Toleration	**41*****	16	**41*****	16	**19*****	12	**8**	9
expected	29.0	13.4	26.7	14.5	13.0	10.3	6.3	7.3
p-value	.0007	.9	.000005	.8	.01	.8	.3	.9
Attack	**16*****	12	**14*****	12	**7*****	12	**7***	**12**
expected	28.4	13.1	24.2	13.2	15.8	12.5	10.0	11.5
p-value	.0006	.7	.002	.7	.0002	.7	.06	.5
Deal	17	**6***	17	**6****	**17**	**6*****	**9**	**3*****
expected	20.9	9.7	19.3	10.5	14.9	11.8	7.6	8.7
p-value	.9	.09	.8	.05	.25	.007	.3	.003

Counts that support the theory are in bold; * p<.1, ** p<.05, *** p<.01.

These results are suggestive, but they ignore the facts that responses are not independent of each other (if a toleration occurs, it means both a deal and an attack did not for that state-year) and that they may also be occurring in close chronological proximity to each other, so that an attack is quickly followed by a deal. We therefore turn to logistic regressions of our measures of nuclear weapons program activity on the three response types. Table 2 reports the results.

Consistent with H1 and H2, toleration appears to encourage increases in nuclear program activity and discourage decreases, while attacks have the opposite apparent effect, and these results are statistically significant for all measures of activity. As H3 predicts, deals appear to discourage decreases in activity. However, deals have only a statistically and substantively weak association with increases in activity, with the sign of this association uncertain. We also find support for H4', since the coefficient on deals is smaller in

Table 2: Proliferation Behavior Soon After Enforcer Responses, Response Counts

	Program	**Pursue**	**Explore**	**Accel.**	**Decel.**	**End**	**Status Ch.**
Toleration	0.703***	0.606*	0.913***	0.699***	-1.028***	-1.065***	0.007**
	(0.003)	(0.090)	(0.000)	(0.002)	(0.000)	(0.000)	(0.017)
Attacks	-0.512**	-1.263**	-0.481**	-0.673***	0.318***	0.340***	-0.003**
	(0.018)	(0.010)	(0.040)	(0.003)	(0.007)	(0.005)	(0.026)
Deals	-0.258	0.292	-0.407	-0.114	-0.970**	-0.935**	0.001
	(0.316)	(0.393)	(0.213)	(0.587)	(0.023)	(0.029)	(0.317)
Observations	5413	5681	5410	5681	475	475	5880

Logistic regression with standard errors clustered on audience countries, except Status Ch., which is linear regression.
Countries that manifested interest in atomic energy, post-1945; p-values reported in parentheses, with * p<.1, ** p<.05, *** p<.01.

magnitude than that for attacks in *Status Change*, the only measure of activity that combines increases and decreases in activity and thus gives an overall estimated effect.

Very similar results obtain when we restrict the sample to the period after 1969 or after 1976. While statistical significance declines somewhat in line with the progressively smaller sample, the signs of the coefficients for toleration and attack remain consistent with the theory, and their magnitude remains large. In the post-1976 sample, the signs of the coefficients for deals all become consistent with the theory, but their magnitudes are similar. We interpret this as evidence that the establishment of the nonproliferation regime after 1969 and the beginning and consistency of nonproliferation sanctions after 1976 do not create large biases in our results.

Next we can compare the substantive effects of enforcer responses to those of other determinants of proliferation behavior. Table 3 presents regressions of our measures together with control variables that extant literature identifies as important causes of proliferation.[14]

[14]This literature uses only *Program*, *Pursue*, and *Explore* as dependent variables, but in principle the same arguments should also apply to our other indicators of nuclear activity. For a review, see Bell (2016).

Table 3: Proliferation Behavior Soon After Enforcer Responses, Response Counts

	Program	**Pursue**	**Explore**	**Accel.**	**Decel.**	**End**	**Status Ch.**
Tolerations	0.675*	0.104	0.905**	0.498*	-0.693**	-0.739**	0.003
	(0.055)	(0.746)	(0.014)	(0.061)	(0.040)	(0.043)	(0.230)
Attacks	-0.515	-2.025**	-0.526	-0.729*	0.475***	0.509***	-0.003*
	(0.119)	(0.026)	(0.145)	(0.052)	(0.000)	(0.000)	(0.067)
Deals	-0.349	-0.123	-0.486	-0.308	-0.399	-0.330	0.000
	(0.300)	(0.783)	(0.222)	(0.248)	(0.413)	(0.509)	(0.741)
Interstate Conf	0.391***	0.342	0.363***	0.275**	-	-	0.015**
	(0.002)	(0.292)	(0.007)	(0.048)			(0.030)
Civil Conf	-0.052	0.045	0.012	0.015	0.176	0.168	-0.001
	(0.598)	(0.645)	(0.893)	(0.833)	(0.462)	(0.523)	(0.196)
Nuclear Rival	2.391***	2.917***	2.604***	2.279***	0.475	0.252	0.005
	(0.000)	(0.001)	(0.000)	(0.000)	(0.458)	(0.691)	(0.559)
GDP per capita	-0.019	-0.107*	-0.029	-0.044	0.093**	0.110***	-0.000
	(0.469)	(0.064)	(0.321)	(0.149)	(0.011)	(0.006)	(0.503)
Polity	-0.041	0.093**	-0.020	0.002	0.027	0.013	-0.000
	(0.347)	(0.042)	(0.668)	(0.948)	(0.415)	(0.735)	(0.252)
Observations	4582	4804	4581	4804	301	301	4923

Logistic regression with standard errors clustered on audience countries, except Status Ch., which is linear regression.
Countries that manifested interest in atomic energy, post-1945; p-values reported in parentheses, with * p<.1, ** p<.05, *** p<.01.

Interstate Conf and *Civil Conf* capture episodes of interstate and civil violence a country suffers (Marshall, 2019); *Nuclear Rival* marks the presence of a long-term rival with nuclear weapons (Thompson and Dreyer, 2011); *GDP per capita* measures the country's PPP-adjusted level of economic development (Feenstra, Inklaar and Timmer, 2015); and *Polity* scores the regime type of the country (Marshall, Gurr and Jaggers, 2014). Similar support for our hypotheses emerges, though with somewhat attenuated statistical significance due to the addition of variables and smaller samples.[15]

The substantive effects of an enforcer's responses can be quite large. Consider the per-

[15]The online appendix shows that support is stronger when we include only the variables determined by Bell (2016) to be good predictors of proliferation behavior.

spective of a state with a non-trivial chance of seeking nuclear weapons: one with a nuclear rival, experience of an interstate conflict, polity score 0 and average GDP per capita. If this state has not observed any enforcer response within the past five years, our *Accelerate* model places its baseline probability of accelerating its nuclear efforts (beginning a program or moving from exploration to pursuit) at .064. If instead it had observed an attack on another country seeking nuclear weapons, the probability of acceleration drops to .035, a 45% reduction. Instead observing toleration of another country's successful program raises the probability of acceleration to .096, a 50% jump. These effects are comparable in magnitude to those of other variables thought to be highly influential in a state's decision to seek the bomb. Removing the state's nuclear rival would decrease the probability of acceleration to .007, an 89% reduction, while eliminating its experience of interstate conflict would decrease the probability to .050, only a 22% drop.

Next consider the perspective of an enforcer facing a proliferant whose program is on the verge of success. Suppose, for example, that in 1964 the US had attacked rather than tolerated China's near-success nuclear weapons program, as it seriously considered doing (Burr and Richelson, 2001). If the attack prevented China from going nuclear for the next five years, Taiwan would both have observed an attack rather than a toleration and also have lacked a nuclear rival. As a result, its model-estimated probability of initiating a nuclear weapons program in those five years would have fallen from .56 to .03, a 95% drop. Even if the attack had failed and China had still gone nuclear in 1964, Taiwan's chance of starting a program would still decrease to .24, a 57% reduction.

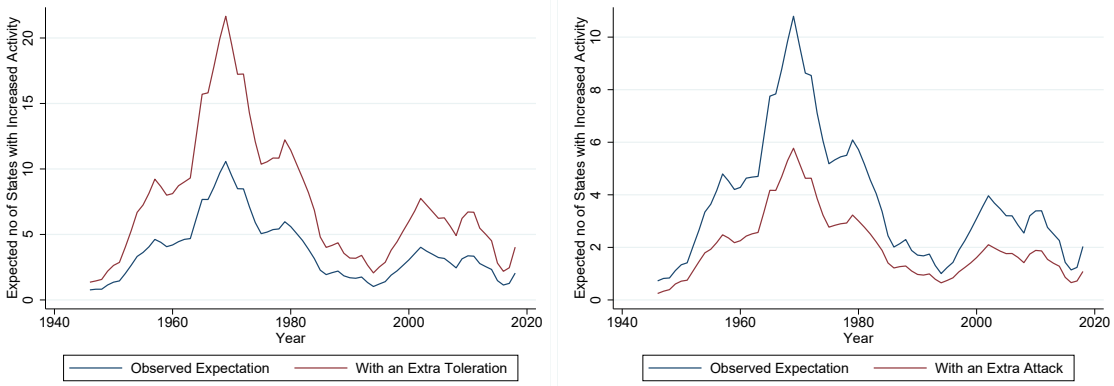
Of course, a chosen response affects an entire audience of potential proliferants, not just one as in our illustration above. Other strong determinants of proliferation activity

such as nuclear rivalry or experience of interstate conflict do not have such widespread effects, because most states have few rivals and most interstate conflicts involve few states. To fairly compare their effects to those of enforcer responses, we must calculate the *aggregate* effect of a response across the whole audience. To do that, we calculated the effect of an additional attack or toleration in a given year on each audience country's probability of acceleration, from a country-specific baseline based on observed regressor values from the Accelerate model in Table 2. We then simulated the expected number of new programs within a five-year period under the baseline scenario and under the hypothetical addition of one specific response. Figure 1 presents these comparisons over time for attacks and toleration. On average, an attack results in approximately 47% fewer accelerations within the following five years. For instance, an additional attack in the early 1960s would be expected to be followed by fewer than 6 accelerations in the next five years, instead of the 10 that would be expected to occur otherwise in the attack's absence. An additional toleration during the same period would almost double the expected number of accelerations, from 10 to about 21. The percentage effect remains high in different time periods, ranging from a 77% to a 117% increase in the five-year expectation for an additional toleration, and a 35% to 66% reduction due to an attack. These effects are much larger than those of a few states acquiring a nuclear rival or experiencing interstate conflict.

In Policy-Makers' Own Words

Next we draw on primary and secondary sources to show that potential proliferants keenly observed enforcers' responses to other states' nuclear programs and updated their expectations of how their own program would be treated, which encouraged or discouraged their

Figure 1: Expected Number of Accelerations in Next Five Years



own efforts to develop nuclear weapons. We also show that enforcers expected their choice of response to one proliferant to influence other states' willingness to seek weapons, and heavily weighed the size of the audience in those choices. We surveyed the entire historical record of tolerations, attacks, and deals and states' subsequent reactions to them. Of the 55 cases of enforcer responses and reactions for which we could find relevant evidence, 47 support the theory and only 7 contradict it, with a single case inconclusive. For brevity, we present only a few of those cases here, in order to give the reader a sense of the qualitative evidence in favor of our theory. We document the rest of the cases in the online appendix.

Tolerating India Encouraged Brazil, South Africa, and Yugoslavia (H1)

We used primary documents from Brazil, South Africa, and Yugoslavia, as well as recently published secondary sources on these countries' nuclear programs, to investigate their reactions to the toleration of India's acquisition of a "peaceful nuclear explosive" (PNE) in 1974. These are cases in which the usual explanations for proliferation leading to further

proliferation do not apply: India posed no security threat to any of these countries and there is no indication than any of them saw India as a source for assistance in obtaining nuclear technology. The evidence instead supports our theory: these countries inferred from the toleration of India's program that their own efforts would also be tolerated, and were encouraged in their pursuit.

South African officials closely monitored the US response to the Indian program. They took note of US government agencies' inability to arrive at "a definite posture on the matter" despite the official mantra that they opposed proliferation due to "the adverse impact it would have on world stability" (Louw, 1974). The enforcer's turning a blind eye to New Delhi's back-door weaponization led the leadership in Pretoria to expect that "a South African nuclear test, possibly proclaimed to be a PNE, would be tolerated" and "would not lead to excessive international reaction" (Rabinowitz, 2014, 111). By the end of 1974, Prime Minister John Vorster gave the green light for "the development of a limited nuclear explosive capability and the construction of an underground test site" (Albright, 1994, 41).

Immediately after India's test, Brazil's foreign minister thought the superpowers "will feel tempted to make the safeguard norms more rigid" and restrict nuclear cooperation with non-NPT signatories like Brazil (Azaredo da Silveira, 1974). But as decisive action from the enforcers failed to materialize, the Brazilians understood that India went nuclear "without any serious resistance from Washington" (Araújo Castro, 1974).

The Brazilian government "welcomed enthusiastically the singular success of the Indian A[tomic] E[nergy] C[ommission]" (Singh, 1974*a*). That the Indian effort was a source of inspiration for the Brazilians is evidenced in Foreign Minister Antonio Fran-

cisco Azaredo da Silveira's statement that "Brazil and India are going together," proceeding along on a "parallel path" (Singh, 1974*b*). Moreover, after India tested its nuclear device, the leadership in Brasilia reportedly started "boasting of the fact that they have the capability and [...] the motivation to build an atomic bomb" (Araújo Castro, 1975).

Brazil had long considered the possibility of building and detonating a nuclear artifact, following the same route as India (Costa e Silva, 1967). But its efforts to secure the necessary technology had been languishing since the 1950s. The Indian test prompted Brazil to sign a nuclear cooperation agreement with West Germany for the pursuit of enrichment and reprocessing technology (Abreu, 1974). This decision was motivated by the desire to have a dual-use nuclear program, following the Indian example (Patti, 2014, 100).

The Brazilians expected their weaponization efforts to be treated the same way as India's, especially after American policy-makers stated in 1975 that "[w]e cannot stop them [the Brazilians] if they do that [build an atomic bomb] on their own" (Araújo Castro, 1975). As a result, Figueiredo approved the launch of the "Projeto Autonomo" (the Autonomous Program), also known as the "Parallel Program" (Patti, 2014, 158). The enforcers' mild response to India's program thus encouraged Brazil by leading its government to expect that its own program would be tolerated.

The government of Yugoslavia also expressed admiration and support for India's acquisition, congratulating India on its "great technological success, which raised hopes that other developing countries could follow the same path" (Bondžić, 2016*b*, 324). That New Delhi's nuclear pursuits served as an example for Belgrade's is evidenced in the admission by a high-ranking official that Yugoslavia "has long been a follower of India's nuclear research" (Bondžić, 2016*a*, 145). The Yugoslav leadership emphasized that India's success

"deserves all the more attention because [India] is a developing country", setting a useful precedent for Yugoslavia (Bondžić, 2016*a*, 143-144).

President Tito had previously considered building nuclear weapons but abandoned this ambition in 1962 after the normalization of Soviet-Yugoslav relations. India's test catalyzed Yugoslavia's resumption of its program (Potter, Miljanic and Slaus, 2000). The month after India's test, Tito summoned the directors of the security and scientific establishments in Yugoslavia and ordered them to "utilize dramatically expanded nuclear power program as a cover for a parallel military effort" (Potter, Miljanic and Slaus, 2000, 66). After some deliberations on which type of technology would provide the best cover, the Yugoslav leadership settled on the nuclear power plant it had agreed to buy from the United States in 1973 (Toon, 1973). The toleration of the Indian program spurred the expansion of the Yugoslav nuclear program, leading to expedited construction of this reactor.

Attacking Iraq Discouraged Iran and Libya (H2)

We examined primary and secondary sources in Arabic, English, and Farsi about Iran's and Libya's reactions to the US invasion of Iraq in 2003 to disarm it of weapons of mass destruction. The punishment meted out to Iraq had the hypothesized effect: both were discouraged in their pursuit of nuclear weapons because they feared suffering the same fate.

In the aftermath of the invasion, Libyan leader Muammar Gaddafi "increasingly saw the pursuit of a nuclear weapon as counterproductive in terms of security" (Braut-Hegghammer, 2008, 71). Given that Saddam's alleged programs brought about his downfall, Libya expected to suffer the same fate (Corera, 2006, 182; Bowen, 2006, 64). Indeed, Gaddafi

described Libya's nuclear program as "a danger and threat to Libya's very integrity" (Corera, 2006, 182). As a result, in December 2003, he agreed to dismantle the program and submit to international inspections (Sanger and Miller, 2003). Gaddafi admitted that "the war in Iraq may have played a role in his decision to dismantle his country's weapons of mass destruction programs" (CNN, 2003). Saddam's fate taught him that now the Libyan regime "risked a U.S. invasion or preemptive strike" (Braut-Hegghammer, 2016, 213). The lessons Gaddafi learned from Saddam's experience prompted him to ask the British and the Americans for "assurances that there would be no secret efforts to pressure the direction of regime change in Libya" like those that toppled the Iraqi leader (al Islam Gaddafi, 2004). "As soon as we got these assurances, everything went forward," his son confessed in 2004 (al Islam Gaddafi, 2004). The Libyan leadership then ended its program in a deal made with the US and UK.

Iran launched a covert nuclear weapons program in the late 1990s called Project 110. In the aftermath of Iraq's invasion, that large-scale effort was halted (Arnold et al., 2021, 233). Iran's leadership decided to "reorient" Project 110 towards "a more disguised, albeit smaller nuclear weapons program" (Albright, Heinonen and Stricker, 2019). The fear that Iran would be subjected to a US attack pushed Tehran to change course (Albright, Heinonen and Stricker, 2019). An April 2003 statement by President Muhammed Khatami makes this clear: "They tell us that Syria is the next target, but according to our reports, Iran could well follow" (Takeyh, 2003, 23). To avoid that fate, the Iranians put out feelers to the Bush administration in May 2003, offering "full transparency for security that there are no Iranian endeavors to develop or possess WMD, full cooperation with IAEA based on Iranian adoption of all relevant instruments" (Kristof, 2007, 1). Even when this offer

was spurned, the leadership in Tehran kept its nuclear program in a dormant state, for fear that "Washington would marshal support through the United Nations Security Council for a limited military strike or coercive rollback of Iran's nuclear fuel cycle" (Volpe, 2015, 230).

The North Korea Deal Encouraged Iran and Libya (H3)

We examined primary and secondary sources in Arabic, Farsi, and English about Iran's and Libya's reactions to the 1994 Agreed Framework with North Korea. Direct evidence from these countries' policymakers is scant. However, we infer that the North Korea deal encouraged their pursuit of the bomb from the fact that, soon after the deal was made, both states greatly increased their nuclear efforts and pursued technologies that were qualitatively different from their earlier acquisitions.

According to the IAEA, in July 1995 Libya "made a strategic decision to reinvigorate its nuclear activities" (Montgomery and Mount, 2014, appendix) after years of stagnation. Subsequently, Gaddafi began pursuing "the building blocks for a nuclear weapons program through the Khan network" as well as with the help of Libyan physicists based abroad (Braut-Hegghammer, 2016, 203). Gaddafi made his renewed nuclear ambitions clear in January 1996, when he urged Arab states "to try by any means" to get nuclear weapons (Braut-Hegghammer, 2016, 203). That the Libyan leader made such a public statement suggests that he believed the enforcer would either tolerate proliferation or try to strike a deal with countries bent on acquiring nuclear weapons.

The size, progress, and nature of the Iranian nuclear program also changed radically after the Agreed Framework. Before 1994, progress within the Iranian nuclear program

was "slow and erratic" and Tehran's quest for "nuclear independence failed miserably" (Corera, 2006, 67; Coll, 2006). A.Q. Khan offered Iran centrifuge designs and machines in the second half of 1993, but it wasn't until October 1994—by which point the Agreed Framework had become a reality—that the Iranians struck a deal with Khan (Corera, 2006, 69). Between 1994 and 1996, the Khan network transferred centrifuge designs, materials, and machines to Iran, allowing for the launch of the Iranian enrichment program in 1997 (Corera, 2006, 69; Director General, 2003).

Iran adopted "an ambiguous nuclear posture," which experts have described as "a trick that Iran clearly learned from North Korea as it was developing its nuclear program in the 1990s" (Sigal, Wit and Ehteshami, 2009, 31). The North Korea deal helped Iran in its dealings with the international community as it sought transfers from above-board suppliers like Russia. "Washington's promise to supply the DPRK with light-water reactors (LWRs)" as part of the North Korea deal served "as a precedent" for Iran's 1995 Bushehr deal with Russia (Szalontai, 2021, 83). Tehran even took the risky step of seeking sensitive nuclear assistance—that could only be useful for building nuclear weapons—from Russia (Albright and Hinderstein, 2004, 63-64). In the second half of the 1990s, Iran engaged in a range of activities "relevant to the development of a nuclear explosive device" (Director General, 2015, 6).

Broader Implications

Our theory holds that an enforcer's choice of response to a state violating the international order will influence other states' expectations of how they will be treated, thus affecting their decisions about whether to do so. Of course, states will be influenced only if they

observe the enforcer's choice. Our theory therefore implies that enforcers should attempt to conceal responses they anticipate would encourage other states to violate. We leave serious testing of this prediction to subsequent research, but the evidence currently available in the context of nuclear nonproliferation is consistent with it. The US made a deal with Israel, South Africa, and Pakistan not to test their newly-acquired weapons, precisely because it feared that being seen unambiguously to have tolerated their programs' success would encourage other states to follow their examples (Carnegie and Carson, 2018; Rabinowitz, 2014; Rabinowitz and Miller, 2015).

The US has also sought to conceal some of the nonproliferation deals it has made. Those with South Korea and Taiwan were negotiated via quiet diplomacy, with the resulting agreements not publicized. We can also see echoes of this concern in the US refusal to negotiate directly with or make public concessions to Iran in the run-up to the 2003 deal with the EU-3, and in the US hesitation to make its 2003 deal with Libya explicit. In these cases, the US perceived a danger of encouraging an audience of potential near-term proliferants. By contrast, the negotiations with Iran that led to the 2015 deal were conducted openly and resulted in a formal, publicized agreement, perhaps because the US perceived no other state as a near-term proliferation concern at the time.[16]

We showed that the historical record is consistent with our theory when it comes to the context of nuclear proliferation. More broadly, our evidence strengthens the case that the nonproliferation regime has had a large effect on the occurrence of proliferation, relative to what would have happened in its absence.[17] It has been argued that the superpowers were the principal enforcers of nonproliferation, and that this should be viewed as a con-

[16]For the details on this case, see the online appendix.

[17]See Fuhrmann and Lupu (2016) for a review of the debate over the regime's efficacy.

stitutional element of the overall nonproliferation regime (Coe and Vaynman, 2015). It is easy to believe that the US or USSR were important to preventing particular instances of proliferation, by intervening directly to stop particular states from acquiring nuclear weapons, as in cases like West Germany or Iraq. However, this kind of direct intervention was relatively rare. Most of the time, most states that might have pursued nuclear weapons were not obviously coerced by any enforcer. A skeptic might argue that because the nonproliferation regime was only rarely enforced, it cannot be responsible for the absence of widespread proliferation. Our evidence seriously undermines this argument. It suggests that, quite apart from the enforcers' record of stopping particular states' programs, their occasional resort to force against those states has influenced many other states to abandon the pursuit of nuclear weapons *even absent any direct intervention against them.*

Our findings imply that the nonproliferation regime works just like domestic laws against criminal behavior. Though some criminals get away with it or make deals to escape punishment, the fact that others are visibly subjected to severe consequences by law enforcement deters many from engaging in criminal behavior at all. Similarly, some states get nuclear weapons or make deals to avoid punishment when caught. But others are attacked by enforcers, and the fear of suffering the same treatment discourages many from seeking the bomb. Enforcers play to the audience, and the audience responds.

References

Abreu, Hugo de Andrade. 1974. "Memorandum, Information for the President of Brazil, No. 055/74 from the NSC." Wilson Center Digital Archive. August 13.

al Islam Gaddafi, Saif. 2004. "Aishtarayna Khutat Bina' Alqunbulat Alnawawiat Min Bakistan." *Asharq Al-Awsat* . January 5.

Albright, David. 1994. "South Africa and the Affordable Bomb." *Bulletin of the Atomic Scientists* 50(4):37–47.

Albright, David and Corey Hinderstein. 2004. "The Centrifuge Connection." *Bulletin of the Atomic Scientists* 60(2):61–66.

Albright, David, Olli Heinonen and Andrea Stricker. 2019. "The Iranian Nuclear Archive: Implications and Recommendations." Institute for Science and International Security. February 19.

Araújo Castro, João Augusto. 1974. "Telegram from the Brazilian Embassy in Washington, D.C. to the Ministry of Foreign Affairs." Centro de Pesquisa e Documentacao de Historia Contemporanea do Brasil, Antonio Azaredo da Silveira AAS mre be 1974.03.15. November 5.

Araújo Castro, João Augusto. 1975. "Telegram from the Brazilian Embassy in Washington, D.C. to the Ministry of Foreign Affairs." Centro de Pesquisa e Documentacao de Historia Contemporanea do Brasil, Antonio Azaredo da Silveira AAS mre pn 1974.08.15. June 5.

Arnold, Aaron, Matthew Bunn, Caitlin Chase, Steven E. Miller, Rolf Mowatt-Larssen and William H. Tobey. 2021. "The Iran Nuclear Archive: Impressions and Implications." *Intelligence and National Security* 36(2):230–242.

Azaredo da Silveira, Antonio Francisco. 1974. "Report from the Brazilian Foreign Ministry to President Ernesto Geisel, 'Subject: The Indian Nuclear Test'." Wilson Center Digital Archive. May 21.

Bas, Muhammet A. and Andrew J. Coe. 2012. "Arms Diffusion and War." *Journal of Conflict Resolution* 56(4):651–674.

Bas, Muhammet A. and Andrew J. Coe. 2016. "A Dynamic Theory of Nuclear Proliferation and Preventive War." *International Organization* 70(4):655–685.

Bas, Muhammet A. and Andrew J. Coe. 2018. "Give Peace a (Second) Chance: A Theory of Nonproliferation Deals." *International Studies Quarterly* 62(3):606–617.

Bell, Mark S. 2016. "Examining Explanations for Nuclear Proliferation." *International Studies Quarterly* 60(3):520–529.

Benson, Brett and Quan Wen. 2011. A Bargaining Model of Nuclear Weapons Development and Disarmament. In *Causes and Consequences of Nuclear Proliferation*, ed. Robert Rauchhaus, Matthew Kroenig and Erik Gartzke. Taylor and Francis pp. 45–62.

Bernauer, Thomas and Dieter Ruloff, eds. 1999. *Positive Incentives in Nuclear Nonproliferation and Beyond*. University of South Carolina Press.

Bleek, Philipp C. 2010. Does Proliferation Beget Proliferation? Why Nuclear Dominoes Rarely Fall. PhD thesis Georgetown University.

Bleek, Philipp C. 2017. *When Did (and Didn't) States Proliferate?: Chronicling the Spread of Nuclear Weapons*. Belfer Center for Science and International Affairs.

Bondžić, Dragomir. 2016*a*. "Indijska Nuklearna Proba 1974. Godine - Odjeci u Jugoslaviji." *Istorija 20. veka* 1:139–157.

Bondžić, Dragomir. 2016*b*. *Između Ambicija i Iluzija: Nuklearna Politika Jugoslavije 1945-1990*. Beograd: Institut za savremenu istoriju.

Bowen, Wyn Q. 2006. "Libya and Nuclear Proliferation: Stepping Back from the Brink." *The Adelphi Papers* 46(380):7–103.

Braut-Hegghammer, Målfrid. 2008. "Libya's Nuclear Turnaround: Perspectives from Tripoli." *Middle East Journal* 62(1):55–72.

Braut-Hegghammer, Målfrid. 2016. *Unclear Physics: Why Iraq and Libya Failed to Build Nuclear Weapons*. Ithaca, NY: Cornell University Press.

Budjeryn, Mariana. 2016. The Power of the NPT: International Norms and Nuclear Disarmament of Belarus, Kazakhstan, and Ukraine, 1990–1994 PhD thesis Central European University.

Burr, William and Jeffrey T. Richelson. 2001. "Whether to 'Strangle the Baby in the Cradle': The United States and the Chinese Nuclear Program, 1960–64." *International Security* 25(3):54–99.

Carnegie, Allison. 2015. *Power Plays: How International Institutions Reshape Coercive Diplomacy*. Cambridge: Cambridge University Press.

Carnegie, Allison and Austin Carson. 2018. "The Spotlight's Harsh Glare: Rethinking Publicity and International Order." *International Organization* 72(3):627–657.

CNN. 2003. "Gadhafi: Iraq War May Have Influenced WMD Decision.". December 22.

Coe, Andrew J. 2018. "Containing Rogues: A Theory of Asymmetric Arming." *Journal of Politics* 80(4):1197–1210.

Coe, Andrew J. and Jane Vaynman. 2015. "Collusion and the Nuclear Nonproliferation Regime." *Journal of Politics* 77(4):983–997.

Coe, Andrew J. and Jane Vaynman. 2020. "Why Arms Control Is So Rare." *American Political Science Review* 114(2):342–355.

Coll, Steve. 2006. "The Atomic Emporium." *The New Yorker* . August 7.

Corera, Gordon. 2006. *Shopping for Bombs: Nuclear Proliferation, Global Insecurity, and the Rise and Fall of the AQ Khan Network*. New York: Oxford University Press.

Costa e Silva, Arthur. 1967. "Minutes of the Fortieth Session of the Brazilian National Security Council." Wilson Center Digital Archive. October 4.

Debs, Alexandre and Nuno P. Monteiro. 2014. "Known Unknowns: Power Shifts, Uncertainty, and War." *International Organization* 68(1):1–31.

Director General. 2003. "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran." International Atomic Energy Agency. GOV/2003/75, November 10.

Director General. 2015. "Final Assessment on Past and Present Outstanding Issues Regarding Iran's Nuclear Programme." International Atomic Energy Agency. GOV/2015/68, December 2.

Drezner, Daniel W. 1999. "The Trouble with Carrots: Transaction Costs, Conflict Expectations, and Economic Inducements." *Security Studies* 9(1-2):188–218.

Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49(3):379–414.

Feenstra, Robert, Robert Inklaar and Marcel P. Timmer. 2015. "The Next Generation of the Penn World Table." *American Economic Review* 105(10):3150–3182.

Fuhrmann, Matthew and Yonatan Lupu. 2016. "Do Arms Control Treaties Work? Assessing the Effectiveness of the Nuclear Nonproliferation Treaty." *International Studies Quarterly* 60(3):530–539.

Gavin, Francis J. 2015. "Strategies of Inhibition: US Grand Strategy, the Nuclear Revolution, and Nonproliferation." *International Security* 40(1):9–46.

Guzman, Andrew T. 2008. *How International Law Works: A Rational Choice Theory*. New York: Oxford University Press.

Jentleson, Bruce W. and Christopher A. Whytock. 2005. "Who 'Won' Libya? The Force-Diplomacy Debate and Its Implications for Theory and Policy." *International Security* 30(3):47–86.

Kristof, Nicholas D. 2007. "Iran's Proposal for a 'Grand Bargain'." *The New York Times* . April 28.

Kroenig, Matthew. 2009. "Importing the Bomb: Sensitive Nuclear Assistance and Nuclear Proliferation." *Journal of Conflict Resolution* 53(2):161–180.

Louw, D.V. 1974. "Letter to the Secretary for Foreign Affairs, Pretoria, from the Embassy of South Africa, Washington, D.C." South African Department of Foreign Affairs Archives, Pretoria, File 137/10/21, Vol. 2. June 20.

Marshall, Monty G. 2019. "Major Episodes of Political Violence (MEPV) and Conflict Regions, 1946-2018." Center for Systemic Peace.

Marshall, Monty G., Ted Robert Gurr and Keith Jaggers. 2014. "Polity IV Project: Political Regime Characteristics and Transitions, 1800–2013." Center for Systemic Peace.

Miller, Nicholas L. 2014*a*. "Nuclear Dominoes: A Self-Defeating Prophecy?" *Security Studies* 23(1):33–73.

Miller, Nicholas L. 2014*b*. "The Secret Success of Nonproliferation Sanctions." *International Organization* 68(4):913–944.

Milner, Helen V. and Dustin Tingley. 2015. *Sailing the Water's Edge*. Princeton U. Press.

Montgomery, Alexander H. and Adam Mount. 2014. "Misestimation: Explaining US Failures to Predict Nuclear Weapons Programs." *Intelligence and National Security* 29(3):357–386.

Nincic, Miroslav. 2010. "Getting What You Want: Positive Inducements in International Relations." *International Security* 35(1):138–183.

Patti, Carlo. 2014. *O Programa Nuclear Brasileiro: Uma História Oral*. Fundação Getulio Vargas.

Potter, William. C, Djuro Miljanic and Ivo Slaus. 2000. "Tito's Nuclear Legacy." *Bulletin of the Atomic Scientists* 56(2):63–70.

Rabinowitz, Or. 2014. *Bargaining on Nuclear Tests: Washington and Its Cold War Deals*. New York: Oxford University Press.

Rabinowitz, Or and Nicholas L. Miller. 2015. "Keeping the Bombs in the Basement: U.S. Nonproliferation Policy toward Israel, South Africa, and Pakistan." *International Security* 40(1):47–86.

Sanger, David E. and Judith Miller. 2003. "Libya to Give Up Arms Programs, Bush Announces." *The New York Times* . December 20.

Sigal, Leon V., Joel Wit and Anoush Ehteshami. 2009. "North Korea and Iran." Washington, DC: Stimson Center.

Singh, Prithi. 1974*a*. "Telegram from India's Ambassador to Brasilia to Dr. J. S. Teju." Archives of the Ministry of External Affairs of India, BRA/APS/110/74. July 10 18.

Singh, Prithi. 1974*b*. "Telegram from India's Ambassador to Brasilia to Dr. Sethna. Subject: Brazilian Initial Reaction to India's Peaceful Nuclear Explosion." Archives of the Ministry of External Affairs of India, WII/103/21/74. May 18.

Spaniel, William. 2015. "Arms Negotiation, War Exhaustion, and the Credibility of Preventive War." *International Interactions* 41(5):832–856.

Szalontai, Balazs. 2021. "'This Is Iran, Not North Korea': Conflicting Images of the DPRK in Iranian Public Discourse." *North Korean Review* 17(1):79–95.

Takeyh, Ray. 2003. "Iran's Nuclear Calculations." *World Policy Journal* 20(2):21–28.

Thompson, William R. and David Dreyer. 2011. *Handbook of International Rivalries.* Washington, DC: CQ Press.

Toon, Malcolm. 1973. "Telegram from the US Embassy in Belgrade to the Secretary of State." National Archives and Records Administration, Record Group 59, Central Foreign Policy Files, 1973-1979. November 28.

van Aaken, Anne and Betül Simsek. 2021. "Rewarding in International Law." *American Journal of International Law* 115(2):195–241.

Volpe, Tristan A. 2015. Proliferation Persuasion: Coercive Bargaining with Nuclear Technology PhD Thesis The George Washington University.

Walter, Barbara F. 2006. "Building Reputation: Why Governments Fight Some Separatists but Not Others." *American Journal of Political Science* 50(2):313–330.