Stanton Nuclear Security Fellows Seminar

PANEL 3: Nonproliferation

1. Rebecca Gibbons, RAND

Why Not Comply? Understanding State Decision-Making within the Nuclear Nonproliferation Regime

BACKGROUND:

More than 30 states are seeking civilian nuclear technology in the coming years, easing the path to potential nuclear weapons programs. Policymakers will need to understand how states make decisions not only on the issue of whether to develop nuclear weapons, but also on their participation in the broad set of activities that encompass the overall nuclear nonproliferation regime, e.g., the NPT, its nuclear safeguards agreements and other nonproliferation activities . Learning why some states cooperate within the regime and others do not will suggest the best avenues for the United States to pursue in designing policies involving potential carrots and sticks. For example, one set of policies would flow from the finding that states make their decisions based on U.S. nuclear policies and reductions through arms control in its nuclear posture. Another set of policies would flow from the finding that decisions are made based the regional security context.

OBJECTIVE:

Research on nuclear proliferation and the nuclear non-proliferation regime has largely focused on the question of why states develop nuclear weapons programs.   The literature for the most part looks at how the proliferation by new nuclear weapons states undermines the nuclear non-proliferation regime and assumes that the absence of nuclear proliferation equates to cooperation within the broader regime. In fact, cooperation with the nuclear nonproliferation regime is not so simple. After NPT ratification, regime cooperation varies significantly from state to state.

So this project asks: what factors explain why some NPT states comply with all regime agreements while others comply selectively. Further, why do some states quickly sign on to new agreements while others delay participation for years, even decades, if they join at all?

RESEARCH DESIGN:

The methodology for this project is twofold. First, I am using an original dataset of non-proliferation cooperation indicators to systematically test theories explaining variation in regime behavior.   In addition, I will conduct a set of regional case study comparisons to further understand the mechanisms by which states make decisions related to the non-proliferation regime. Notional cases include Brazil and Chile in South America, Saudi Arabia and Jordan in the Middle East and Indonesia and Vietnam in Southeast Asia. Brazil and Saudi Arabia are especially important cases for understanding patterns of non-proliferation cooperation. Brazil joined the NPT relatively late, and though it has been a leader in

non-proliferation in some ways—such as including a provision against nuclear weapons in its constitution—it has refused to ratify the Additional Protocol and supports Iran in the conflict over its enrichment activities. Saudi Arabia joined the NPT under strong pressure from the United States and waited over twenty years to sign the most modest safeguards agreement. The cases in Southeast Asia are rarely studied in nonproliferation literature, but their aspirations in civilian nuclear power make them important targets of current and future nonproliferation efforts. Together these case studies will provide sufficient variation to test theories from the statistical analysis while delving deeper into the decision-making processes of non-nuclear NPT states.

Based on the nonproliferation literature, some of the potential hypotheses to explain regime behavior of NPT states include:

1. <u>Affinity with the United States</u>: States with greater affinity to the United States (traditionally the greatest promoter of nuclear non-proliferation) are more likely to cooperate with all aspects of the regime.
2. <u>Security environment</u>: States with enduring rivalries will be less willing to participate in new commitments, especially more stringent safeguards agreements. States in security pacts with nuclear-capable states will be more likely to sign on to all regime agreements.
3. <u>Ideational commitment</u>: States with a strong normative commitment to nonproliferation will be more likely to cooperate with the regime and will do so in a more timely manner than other states.
4. <u>Regime type</u>: Democracies will be more cooperative with all elements of the non-proliferation regime.
5. <u>Network effects</u>: Patterns of regime cooperation may reflect regional or group influences on states.
6. <u>Lack of disarmament progress by the nuclear weapons states</u>: Conventional wisdom among policy-makers and pundits suggests lack of non-proliferation commitment stems from perceived lack of disarmament progress by the nuclear weapons states.

RESEARCH PRODUCT:
Based on the policy implications from this research project, I plan to write and submit a manuscript for publication. In addition, I plan to present early drafts of the project at workshops and conferences in order to receive feedback during the editing stage.

2. Eugene Kogan, BCSIA

Proliferation among Friends: Cold War Lessons for Today

Objective: to understand how the U.S. was able to prevent nuclear acquisition by Cold War allies and draw lessons for possible future cases of allied proliferation. This would involve:

(a) examining the conditions under which technology denial works; and
(b) studying alternative approaches to stopping allied / friendly nuclear aspirants.

Overview: What can the United States do to thwart the nuclear ambitions of its allies? Looking to the past, the U.S. was able to leverage its alliance commitments to stop some friendly states from going nuclear. Looking to the future, Iran's possible nuclear acquisition and China's military ascendancy may tempt key U.S. allies in the Middle East and East Asia to consider reducing their reliance on American security guarantees by acquiring independent nuclear deterrents. Saudi Arabia has stated publicly that it will acquire nuclear weapons if Iran goes nuclear. A major demonstration of Washington's hesitation or unwillingness to respond to China's growing military assertiveness can provide the necessary proof of America's unreliability to nuclear self-reliance advocates within Japan, as well. When planning a response to the nuclear pursuit by either of these friends, the U.S. can draw lessons from the successes and failures of its nonproliferation efforts against its Cold War-era allies.

This study expands on my Ph.D. dissertation which analyzes the U.S. nonproliferation efforts against Cold War allies and friends—Taiwan, South Korea, Israel and Pakistan—by trying to understand which tools may be more or less effective when confronting Tokyo, Riyadh and other potential allied / friendly nuclear aspirants. The key finding of my doctoral thesis is that technology denial was more effective than threats of punishment (military or economic sanctions or security abandonment) in stopping and reversing allied nuclear programs in the 1960s-80s. The U.S. had an easier time enforcing coercion by denial against allies that were highly dependent on the U.S. security protection than against allies whose security did not depend heavily on the U.S. Washington did not always have to offer significant additional incentives to highly-dependent allies, and could instead simply force them into submission. For instance, South Korea and, particularly, Taiwan were highly vulnerable to pressure because of their high security and energy dependence. Low-dependence allies did not respond to either non-military rewards (e.g., economic and technological offers) or limited military reassurance (military aid) alone. Likewise, the U.S. could not stop such allies by either (or both) punishment or half-hearted technology denial. Pakistan and Israel, for example, were shielded from the harshest effects of pressure by their low security dependence. These four cases hold insights for potential proliferation challenges from Saudi Arabia and Japan.

Saudi Arabia does not possess the level of technological capability—strong nuclear scientific expertise, technology or ready access to fissile materials—that Japan does. Technology denial, while almost impossible against Tokyo, is feasible against Riyadh, and my research will, first, explore how such a strategy can be pursued. Second, it will ask how Washington can make its security assurances more credible to both countries in a time when U.S. domestic political pressures will push Washington

towards making fewer, rather than more, international commitments. What kind of security dialogue is required between the U.S. and its allies to strengthen their confidence in American protection? (For example, how can the U.S. counteract the nationalistic narratives in Japan that argue for nuclear self-reliance?) What actions shook the Cold War allies' confidence in Washington's determination to protect them?—and how can we avoid those situations again? What type of regional security arrangements can be envisioned, which could provide additional layers of protection for our allies, thus making their nuclear pursuit less necessary? For example, the U.S. could participate in loose regional coalitions, which would lack significant formal treaty obligations, involve more cost-sharing among allies, and would be narrowly-focused on a specific regional challenge (e.g., Senkaku Islands dispute)—all features that would make them more palatable to Congress and to American people. Such flexible alliance-type arrangements may provide just enough of a firm commitment our allies need to forgo pursuing their own nuclear weapons.

Research design: This project draws on historical cases of successes and failures of the U.S. nonproliferation efforts against its allies in order to explain the outcomes in these cases and to formulate prescriptions for dealing with future friendly states with atomic appetites. I will engage in in-depth case study research to unpack the concept of "going nuclear" in tracing the dynamics at the core of the proliferation process. In particular, I will focus on Saudi Arabia and Japan, which are important to study because they are key U.S. allies in strategically important regions. The two cases provide good variation in their technological capabilities, security needs and historical backgrounds to make for a fruitful analysis of which nonproliferation tools are likely to work for different types of allies.

Research product: My objective for this year is to submit an article to a peer-reviewed journal (International Security, Security Studies). I will also work on turning my Ph.D. thesis into a book, in which I draw the lessons of the U.S. Cold War-era nonproliferation efforts for today.

Target audience: My project holds significant lessons for U.S. policy-makers. Nuclear allies can cause serious problems for Washington. (Kargil in 1999 immediately comes to mind.) Thus, officials working in the area of nonproliferation will find useful historical insights about how the U.S. sought to contain a variety of friendly states during the Cold War. Based on this historical background, I will formulate a set of policy recommendations that U.S. foreign policy decision-makers can utilize in confronting contemporary proliferation challenges from friendly states.

3. Neil Narang, CISAC

Are Weapons of Mass Destruction Substitutes or Compliments?: Exploring the Causes and Consequences of Biological and Chemical Weapons Proliferation

I. Research Problem:

Policymakers and analysts often use the term "weapons of mass destruction" (WMD) to distinguish a broad class of non-conventional weapons technologies including chemical, biological, radiological and nuclear weapons (CBRN). It is interesting to note, however, that the meaning of the term has evolved dramatically from the time it was first used in reference to nuclear weapons in the 1946 resolution founding the Atomic Energy Commission, to its current usage in US military doctrine to refer to biological, radiological and chemical weapons as well. Perhaps not surprisingly, the increasing scope and application of the term has generated a considerable amount of debate from members of the military and technical communities, who typically differentiate the technologies by their strategic purpose and destructive potential. Indeed, the popular and prolific use of the term may obscure important differences between nuclear, chemical and biological weapons.

Do policy makers and military leaders treat nuclear, chemical and biological weapons as substitutes or complements in their overall weapons arsenal? What is the actual empirical relationship between CBRN weapons? Does possessing a nuclear weapons program or capability increase or decrease the probability that states will pursue biological or chemical weapons? Finally, are the same factors known to be correlated with nuclear weapons proliferation also correlated with biological and chemical weapons proliferation as well?

The answers to these questions have important implications for academics and policy makers beyond the semantic debate. For example, if the empirical evidence suggests that leaders treat nuclear, biological and chemical weapons capabilities as substitutes in their strategic arsenal (perhaps because each one is perceived to increase national security in a similar way), then analysts should adjust their assessments of proliferation risk downward for one capability conditional on observing another and reallocate defensive resources accordingly. Conversely, if evidence suggests that leaders treat these weapons technologies as compliments (perhaps because each one is perceived to increase national security in a different way), then analysts should adjust their assessments of proliferation risk upward for any technology given another, or conditional on observing factors associated with proliferation of another capability.

Finally, the relationship between CBRN weapons has implications for international policies designed to alter proliferation incentives, such as the NPT. If the evidence suggests that leaders treat the three capabilities as substitutes, then efforts to create a more robust nuclear non-proliferation regime may have the inadvertent consequence of increasing demand for biological and chemical weapons capabilities, thus shifting proliferation risk.

II. Significance of Research and Relevance to the Stanton Foundation Nuclear Security Fellowship Program:

Answers to the research questions above will directly inform policymakers' and academics' understanding of the causes and consequences of CBRN proliferation. In addition to investigating whether the same factors known to be associated with a state's willingness to pursue/acquire nuclear weapons are also associated with a state's willingness to pursue/acquire biological and chemical weapons, I also seek to determine the relationship between the three weapons technologies by estimating the impact of possessing any one technology on the likelihood that a state will pursue/acquire the other two, controlling for states' underlying demand.

Many states that lack nuclear weapons possess biological or chemical weapons. Yet, for all the research conducted over the last half-century on the reasons leaders acquire nuclear weapons, we know surprisingly little about the determinants of biological and chemical weapons proliferation. Scholars have focused almost exclusively on the logic employed by individual leaders when deciding whether to acquire nuclear weapons – describing in some detail how various domestic and international factors may have influenced their decision. While instructive, these studies often stop short of testing whether certain factors tended to be associated with the proliferation of biological and chemical weapons technologies. We also know very little about how chemical and biological weapons subsequently affect deterrence strategy and security outcomes, such as crisis escalation and the hazard of war.

III. Literature Review:

Jo and Gartzke (2007) characterize proliferation research as focusing on either a state's *willingness* or *opportunity* to proliferate. The majority of research focuses on the demand for nuclear weapons. For example, Sagan (1996) argues that states seek nuclear weapons for three primary reasons: the desire to deter external aggression, as a result of domestic political lobbies with parochial interests, or as a result of international norms or desire for prestige. Other scholars have identified additional factors that influence a state's demand for nuclear weapons. Solingen (1994, 1998, 2007) has shown how specific development strategies of domestic political coalitions influence demand for nuclear weapons. On the other hand, Hymans (2006) argues that the conception of individual leaders about their national identities is a key component in explaining demand for nuclear weapons.

Supply-side approaches start by recognizing that whether states want nuclear weapons may be irrelevant if they are unable to acquire them. Nations may lack critical technology, resources and expertise required to build nuclear arsenals. Researchers in this category have found that states with advanced industrial capacity are more likely to acquire nuclear weapons (Singh and Way, 2004).

Specifically, quantitative studies of nuclear proliferation have found that measures of economic development and industrial capacity are robustly associated with greater risk of nuclear proliferation. Interestingly, Kroenig (2009) shows that states without this capacity can still find opportunities to proliferate by importing sensitive nuclear materials and technologies from more advanced industrial countries.

Researchers have explored nuclear security from multiple perspectives. With game theory, scholars have assessed crisis stability, various deterrent strategies, credible threats, and the consequences of proliferation (Berkowitz 1985; Brito and Intriligator 1996; Bueno de Mesquita and Riker 1982; Intriligator and Brito 1981; Powell 1990; Schelling 1960, 1966). Others scrutinize the psychological underpinnings of deterrence (Jervis 1984; 1989; Jervis, Lebow, and Stein 1985). Yet, lacking empirical tests, the literature has more plausibilities than firm conclusions. Recent research has begun to provide this empirical foundation (Gartzke and Jo 2009, Horowitz 2009, Beardsley and Asal 2009, Rauchhaus 2009, Singh and Way 2004, Fuhrmann 2009, Kroenig 2009). Still, much more remains to be done.

Remaining Questions: As noted above, many states that lack nuclear weapons possess biological or chemical weapons. While nine nations currently possess some form of nuclear weapons capability, three times that number field chemical and/or biological weaponry. As a result, chemical and biological weapons are often referred to as the "poor man's nuclear weapon." Yet, understanding the degree to which this phrase accurately characterizes states' underlying motives for pursuing biological and chemical weapons has at least two important implications. First, the phrase implies that states pursuing chemical and biological weapons generally have the same motives as those seeking nuclear weapons, and that they only seek the former because they lack the economic and industrial capacity to acquire nuclear weapons. Second, the phrase implies a relationship whereby a state's underlying security demands could be satisfied by any of the technologies. To the degree that this is true, states are unlikely to seek nuclear weapons technology, say, after having acquired chemical or biological weapons. It also implies that policies designed to suppress proliferation of one weapon type may simply shift the proliferation risk to another type.

IV. Research Methods:

Following the most recent wave of scholarship examining the causes and consequences of nuclear proliferation, I seek to apply the same game-theoretic and statistical methods to explore the causes and consequences of biological and chemical weapons proliferation. To my knowledge, there has been no systematic statistical analysis of the determinants or effects of biological or chemical weapons on war, peace, or international stability. I seek to exploit the opportunity to do research in this area after a moderate data collection effort.

V. Progress to Date and Schedule for Completion:

A preliminary dataset on biological and chemical weapons has been compiled based on a limited number of sources spanning a short time period. This dataset was prepared by myself and Michael Horowitz at the University of Pennsylvania, and it forms the basis for the much more extensive data and analytical work I propose to conduct. The existing dataset needs to be updated and crosschecked against multiple sources.

I also plan to exploit variation in expert estimates as a useful statistical measure for information about actor uncertainty about capabilities. Other work has used variation in expert estimates about when nations deployed nuclear weapons as an indicator of strategic uncertainty. In initial tests, this uncertainty is tied with increases in the probability of interstate conflict.

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4. Mira Rapp-Hooper, CFR

Absolute Alliances: Signaling Security Guarantees in International Politics (PhD dissertation, Columbia University)

Objectives: Security guarantees (so-called nuclear umbrella alliances) are a form of defense pact that are unique to the nuclear age, yet have never been studied as a distinct type of alliance. Policymakers and scholars have long lamented the credibility problems inherent in security guarantees, yet they have persisted for six decades, and, indeed, outlasted the Cold War itself. This dissertation aims to identify how and why nuclear security guarantees are unique and present a theory of how they form and function despite a host of credibility problems.

Overview: Policymakers and scholars alike have observed that so-called nuclear umbrella alliances are plagued by a fundamental credibility problem: the costs to a nuclear patron of defending an ally may easily exceed the strategic value of the ally itself if the patron becomes the victim of retaliation it might have otherwise avoided. An empirical analysis of nuclear security guarantee treaties reveals that the problems run much deeper than this: security guarantee agreements are broader, longer-lasting, and contain far less information than traditional defense pacts. Unlike typical military alliances, which aggregate states' military capabilities and identify a specific adversary, a discrete military contingency, and particular theater in which the alliance is intended to apply, security guarantees contain blanket promises of protection from a patron to a smaller client state. Nuclear umbrella alliances have a unilateral, guarantee motive and are asymmetric in terms of capabilities (the patron possesses nuclear weapons while the client does not). These facts mean that security guarantees provide allies and adversaries alike with little information about how the patron intends to make good on its existential promise of defensive aid.

Significant international relations literature on signaling would suggest that alliances such as these should not send credible messages to either audience.[1] Yet nuclear security guarantees are some of the longest-lasting alliances in history, and have been cornerstones of grand strategy for the superpowers who extend them and the client states who receive their protection. Why do they have these anomalous features, and how do they form and function in spite of them?

This dissertation theorizes that unlike traditional defense pacts, which aim at deterrence by denial (convincing an adversary that he will not achieve his military objectives), security guarantees endeavor first and foremost to establish deterrence by punishment (dissuading an attack by raising the costs to unacceptable levels). Nuclear weapons and long-range strike capabilities allow patrons to make promises of defense to far-away allies, but they also mean that attacks on those allies could take place with little warning time, and that devastation may be wrought quickly. These technological imperatives, coupled with the type of deterrence they support mean that security guarantees have a goal that is unique in the history of defense pacts—that of war avoidance. Rather than aggregate allies' capabilities to plan for a war against a specific adversary in a specific theater and contingency, security guarantee

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[1] Fearon (1997); Snyder (1997), p. 169; Betts (2013); Leeds (2000; 2003).

patrons extend broad promises of protection and introduce the possibility of nuclear use into adversary calculations, hoping never to fight a war at all.

This goal of establishing deterrence by punishment and avoiding war, however, means that nuclear security guarantees come with much more stringent requirements, both in their formation and in their management, than traditional defense pacts. Because patrons hope never to fight a catastrophic war on their clients' behalf, they must go to great lengths to communicate their intent to uphold these alliances beyond the treaties themselves. Specifically, patrons must connect their potential wartime fates to those of their clients by making their nuclear security guarantee commitments publicly and repeatedly known.[2]   The standing threat to intervene requires patrons to send observable signals of their capability as well as indications of their will to do so to adversary and client alike.[3]

One important set of ways that patrons can compensate for the vague, asymmetric nature of security guarantee pacts is through the demonstration of the military capabilities that support the alliance. This includes the use of non-nuclear indicators such as forward-deployed troops, conventional weapons systems, military bases, and visible joint exercises. It also includes disclosures about the size and composition of the patron's nuclear arsenal, as well as information about deployment patterns.

A second set of signals that patrons can use to communicate their ties to clients are those related to commitment itself: These are measures that suggest that the patron is not only able to defend a far-off ally, but that it has the political will to do so. Included within this category are nuclear declaratory policy and public statements of support for client security. Another important signal of intent is consultation and dialogues with allies, which provides them with information on how their security will be guaranteed. The most significant indicator of commitment is, of course, the formal alliance treaty itself.[4]

Through demonstrations of military capability and political will beyond the alliance treaties themselves, patrons can form and maintain otherwise incredible alliance commitments. Because of the requirements of upholding a war-avoidant pact, however, security guarantees come with much higher upfront costs than traditional defensive alliances. How does alliance signaling, with the goal of war avoidance figure into security guarantee formation and management?

I hypothesize that because of security guarantees' goals of deterrence by punishment and war avoidance, three foundational alliance concepts—balancing, entrapment, and abandonment—function differently in these pacts than they do in traditional defensive relationships. This dissertation tests the following three hypotheses:

H1: An unshared adversary will prevent a nuclear patron from extending a security guarantee to a client. Unshared adversaries will not prevent the formation of traditional defense pacts.

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[2] This is intuitively similar to Schelling's concept of "connectivity." It also accords with the large international relations literature on costly signaling. See, e.g. Fearon (1990; 1992; 1994).

[3] For further discussion of why deterrence by punishment requires stronger evidence of intent, see Snyder (1961), p. 16-24.

[4] For additional discussion of the different types of public commitment nuclear powers may employ, see Snyder (1961),p. 239-240; For a discussion of how formal alliances can act as signaling as well as commitment devices, see Morrow (1994).

H2: When client states face crises, patron public statements and demonstrations of military force should be observed far more frequently in security guarantees than in traditional defense pacts.

H3: Peacetime defense information sharing to address allies' abandonment fears should be observed more frequently in nuclear security guarantees than in traditional defense pacts.

Research Design: This is a mixed-methods dissertation. All three of the hypotheses above are tested using qualitative case studies (comparative cases and process tracing), many of which draw upon original archival research. All three compare a nuclear-age security guarantee with a traditional defense pact. Hypothesis 1 is tested on two cases: the US's decision not to extend a security guarantee to Israel and the formation of the Franco-Russian Alliance. It is also tested using large-n regression analysis, drawing upon rivalry and alliance data. Hypothesis 2 is tested on two cases: the United States' decision to intervene in the 1958 Taiwan Straits Crisis, and Britain's decision not to intervene on behalf of Poland in 1939. Hypothesis 2 is also tested using summary statistical analysis, drawing upon data on international crisis behavior. Hypothesis 3 is tested on two case studies: the formation of NATO's Nuclear Planning Group, and military coordination in the Triple Alliance. Thus far I have found substantial support for my hypotheses.

Research Product: Dissertation/ book manuscript.

Target Audience: The primary audience for this work is international relations/security studies scholars. This is a fairly theory-heavy dissertation, but I hope that some of the case studies, findings, and policy prescriptions will also be of interest to policymakers and strategists focused on extended deterrence and alliance politics.

Policy Contributions: This dissertation aims to provide a systematic understanding of how security guarantees have been formed and managed since 1945. There are several important policy applications of this knowledge. First, prominent officials and other experts have suggest that if Iran acquires nuclear weapons or continues its nuclear pursuits, the United States should consider extending security guarantees to its Gulf partners. The testing of my first hypothesis will provide insights on whether or not extending formal guarantees to these states is advisable, and my second and third hypotheses will generate expectations on what may be required to manage an alliance in this region.

Second, as China rises and North Korea continues to develop a deliverable nuclear capability, the United States' alliances in North East Asia will face myriad challenges, from crises over low-level maritime conflicts, to questions of credibility given the reduced role of nuclear weapons in US defense posture. This project provides insights on how the dilemmas of entrapment and abandonment can be navigated in these extended deterrence relationships.

Third, beyond alliance formation and management, extended deterrence factors into a number of important policy debates. Any future attempt to reduce the size of the US nuclear arsenal is likely to generate significant discussion about the requirements of credible extended deterrence, as are any potential changes to declaratory policy (e.g. a "sole purpose" doctrine). Informed analysis of how security guarantees have functioned in the past can inform these debates.

Expected Findings: I expect to find that nuclear security guarantees are formed and managed much differently than typical defense pacts, consistent with goals of deterrence by punishment and war avoidance. The null hypothesis for each of the hypotheses above is that security guarantees are no different than their traditional defense pact counterparts. If I find support for the null, then the prospect of war in the nuclear age has done little to alter the basic principles of alliance formation and management, despite the unique treaty content of nuclear security guarantees.