Stanton Nuclear Security Fellows Seminar

PANEL 1: National Perspectives

1. Tytti Erästö, BCSIA

Iranian nuclear dispute as a challenge for conflict resolution

Research topic

While few would deny the inhumanity of nuclear weapons or question the value of nuclear arms control and disarmament, in practice the further development, enforcement, and application of related norms often faces strong resistance. In my PhD research, I sought to understand such resistance in the context of the Iranian nuclear issue. Some of the main insights I gained while studying this case is that any attempts to promote arms control and disarmament must necessarily also be exercises in conflict management. The disturbing signs of escalation in the Persian Gulf at the time of writing further reinforce the perception that nonproliferation is ultimately about managing political conflicts—a task which seems to have dangerously failed in the Iranian case. Whereas my thesis focused on the reasons for this failure and proposed changes to the current approach on this basis, my current research seeks to take those proposals further by examining how they can be applied in practice. My current research thus builds directly on previous work.

Theory and method

In my previous research, I sought to understand the Iranian nuclear dispute through the English School theory of International Relations (IR). More specifically, I relied on the English School notions of 'international society', 'pluralism', and 'solidarism', as well as Hedley Bull's ideas on arms control. The English School theory also shaped my methodological choices, as my research focused on the analysis of discourse and text, and could thus be called 'hermeneutical' interpretation. While the previous exposure to European IR theory undoubtedly continues to shape my perspective and method, during my time at the Belfer center I will try to adopt a more policy-oriented approach. In other words, my focus will be on one or two academic articles or shorter discussion papers, which do not necessarily involve any explicit theoretical or methodological discussions. At the same time, however, I will be applying some ideas from the academic field of Conflict Resolution (CR). The aim here, however, is not to build a new theoretical framework but to see whether the CR's problem-solving perspective can be of use in reframing and refining some of the more practical suggestions for ways forward in the Iranian nuclear dispute. In addition, I might be using expert interviews to deepen my knowledge regarding the scope of possible agreement between Iran and the P5+1.

Audience and impact

My research contains a message which is directed at the P5+1, and mainly at US decision-makers. Even though it would not reach those decision-makers directly, my hope is that it will do so indirectly by contributing to the on-going debate about the Iranian nuclear dispute. At the same time, it seeks to add

objectivity to this heavily politicized debate, which even in academic quarters tends to rely more on persistent stereotypes about the nature of the Iranian regime than on proper analysis of facts.

Expected findings

As I am building on previous research, I already have certain arguments and views, which were discussed briefly above, and which cannot be expected to change dramatically. However, the addition of the CR perspective can put these arguments and views in a new light, and a more careful consideration of the potential common ground between Iran and the P5+1—ideally also based on expert interviews—can provide concrete policy suggestions.

2. Zhu Jianyu, BCSIA

Chinese perspective on nuclear terrorism

Purpose and Aims

With the development of nuclear energy and the worsening situation in nuclear proliferation and nuclear terrorism, nuclear security becomes one of the most important topics in international society. To address their own nuclear security problems, many states have started to improve their administrative and judicial system. Though many measures have been taken to strengthen their nuclear security, due to the complexity of nuclear security issue, challenges still exist in both political and technical aspects. So a systematic study on nuclear security is needed.

China has always attached great importance to nuclear safety and security in its promotion of nuclear energy utilization, and established a relatively good legal, regulatory and emergency management system in this regard. Though nuclear security problem is not serious for China now, due to the trends in international nuclear proliferation and nuclear terrorism, it's possible for China to face nuclear security problem in the future. So it's necessary for China to start to examine and assess its nuclear security situation and to make preparation for the future improvement in nuclear security.

In this research, I will assess the risk of nuclear terrorism in China by analyzing the nuclear terrorism threaten for China, the current nuclear material protection situation, and the possibility for nuclear cross-border nuclear transport being intercepted.

Framework and Outline:
Risk of nuclear terrorism for China

This section will contain three parts: investigating world's and Chinese nuclear material stockpile and illegal nuclear transportation, studying on the relation of globalized nuclear industry on nuclear terrorism, and other factors would increase the potential risk of nuclear terrorism.

I will address the risk of nuclear terrorism in China. The critical element to carry out a nuclear attack is the amount of the nuclear material which could be used to fabricating a nuclear bomb, or a crude one. So the investigation of the total global nuclear material stockpile and is dispersion would be investigated, especially, that of China and her neighboring country would be emphasized.

Another features of the nuclear industry, fast-globalizing and rapid-increasing would change the currently status of international nuclear security and would affect the threaten of nuclear terrorism. On one hand, the improving of nuclear industry would enhance the nuclear security level in some regions, on the other hand, the ambition in some regions would increase the risk of losing or misuse of nuclear material, at lest, increase the total quantity and the dispersion of nuclear. A study on this would provide useful information in assessing the risk of nuclear terrorism for China.

Chinese views on nuclear terrorism

This section will contain three parts: the views of academic, public and government.

I will summarize and analyzed the views in this three categories. The views would be sorted and compared in detailed. In the academic aspect, although, different Chinese researchers on nuclear terrorism have different views on the risk of nuclear terrorism in China, the consensus is that, acquiring enough nuclear material is crucial for the terrorist to carry out a nuclear incident. In governmental aspect, as a country with strong nuclear industry system, China should make their effort to reduce the possibility of nuclear terrorism, by securing the nuclear material in China, keeping the research and development of nuclear technologies, and cooperating with international community.

Chinese actives on reducing risk of nuclear terrorism

This section will contain three parts: Chinese nuclear security legislation and system building, regulations on Fissile Material Protection, Control, and Accounting system, and international cooperation to reduce the risk of nuclear terrorism.

I will investigate Chinese actives related to reducing risk of nuclear terrorism on protecting nuclear material and preventing nuclear material illegal transportation, view the current nuclear material protection situation in China, and Chinese activities in reducing the risk of nuclear terrorism. I will investigate the regulations and laws on nuclear security and existing administrative system of nuclear security in China. In the meantime the legal system of other states' and relevant international laws will be also studied. The comparative study can provide reference to China's legislation improvement on nuclear security. Based on the comparison, the assessment to and suggestions could be addressed.

Detection sensitivity and possibility for terrorist acquiring enough material

This section will contain three parts: nuclear material that would be interested to a terrorist, the relation of sensitivity of the detector and the possibility of nuclear material hidden from border inspection in some cases, and other factors may influence the risk.

I will analysis the sensitivity of detection system at borders and the risk that terrorist acquiring enough nuclear material to address the importance that a radioactive detector plays frontier inspection. To steal the material inside a country with good physical protection of nuclear material is hard for the terrorist. Possible ways for them are transporting enough material from outside borders all together or separating the material and shipping them independently. To avoid being detected, take the material separately could be a feasible way to carry the material in border. So calculation on the inspection capability

In the detection system, the inspection capability, the failure and false probabilities are important features related to the threshold by which the alarm is triggered, sensitivity of the sensor and the natural background. The failure probability would discharge the entering nuclear material, high false probability would increase the labor and handicap at border, which is impractical. So studies on threshold determination can put forward a method to balancing the two probability on the base of deter the terrorist carrying nuclear material across the border, thus make the inspection system at borders more efficient.

3. Gregory D. Koblentz, CFR

State-Sponsored Nuclear Proliferation: Why States Share Nuclear Weapons Technology

State-sponsored nuclear proliferation, defined as a government's intentional assistance to another state's nuclear weapon program, including the transfer of weapons-grade fissile material, the technology to produce weapons-grade fissile material, or warhead design information, has had a crucial influence on the spread of nuclear weapons. The nuclear warhead design supplied to Libya by the Pakistani scientist A.Q. Khan was initially obtained from China which was itself the recipient of extensive nuclear assistance from the Soviet Union. Libya and Syria might have become members of the nuclear club thanks to sensitive nuclear assistance from other states if outside intervention had not stopped their programs. The current nuclear crises with Iran and North Korea were triggered by the transfer of uranium enrichment technology from Pakistan. Iran is now offering to engage in nuclear cooperation with countries such as Algeria, Nigeria, Sudan, and Venezuela.

The motivations behind this type of proliferation are an unsolved puzzle. Why do states share nuclear weapons technology—the most powerful military technology ever invented—with other states? The anarchic nature of international relations and the destructive power of nuclear weapons suggest that this type of cooperation should be very rare. And yet states have engaged in nuclear weapon cooperation since the dawn of the atomic age. The first instance of such nuclear sharing was Anglo-American cooperation on the Manhattan Project during World War II. North Korea's assistance to Syria's nuclear reactor project, which was destroyed by an Israeli airstrike in 2007, is the most recent example of this phenomenon. Overall, I have documented twelve cases of states sharing nuclear weapon technology with another state (see appendix).

Surprisingly, state-sponsored nuclear proliferation, which has profound implications for U.S. nonproliferation policy and international security, has received a fraction of the attention devoted to understanding why states develop[1] , forgo[2] , or abandon[3] nuclear weapon programs. A recent two-volume study on the future of nuclear proliferation focused entirely on the demand-side of proliferation and neglected the role of states as suppliers of nuclear weapons technology.[4]

The question of why states share nuclear weapons technology and the security implications of such transfers has been examined largely on a case-by-case basis with little attention paid to theory or comparisons across cases. Early studies on nuclear weapon cooperation were speculative in nature since they lacked any empirical evidence and were not informed by theoretical considerations.[5] The second generation of studies examined nuclear cooperation on a case-by-case basis, again without a theoretical

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[1] Scott Sagan, "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb," *International Security*, Vol. 21, No. 3 (Winter 1996/97):54-86.
[2] T.V. Paul, *Power Versus Prudence: Why Nations Forgo Nuclear Weapons* (Montreal: McGill-Queen's University Press, 2000).
[3] Ariel Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, Vol. 2, No. 3 (Winter 2002/03): 59-88.
[4] William C. Potter and Gaukhar Mukhatzhanova, eds., *Forecasting Nuclear Proliferation in the 21st Century*, 2 Vols. (Stanford: Stanford University Press, 2010).
[5] Lewis A. Dunn, "Nuclear "Gray Marketeering"," *International Security*, Vol. 1, No. 3 (Winter 1977):107-118.

framework.[6] Only recently have political scientists engaged this question from a theoretical perspective with the support of empirical evidence.[7] Even this most recent scholarship suffers from some shortcomings. First, it is too reliant on quantitative methods that do not provide insights into the causal mechanisms behind a government's decision to provide, and sometimes terminate, nuclear assistance. Second, it draws on a narrow slice of international relations theory, primarily neorealism, to explain cases of nuclear cooperation. Matthew Kroenig's strategic theory of sensitive nuclear assistance relies on balance of power and deterrence theory to explain why states share nuclear weapons technology.[8] While sharing a common enemy and being unable to project power against the recipient state may be permissive factors, they are not the proximate causes of sharing nuclear weapons technology. Third, the literature is biased by selecting on the dependent variable, examining only cases where such nuclear cooperation has occurred.[9] There are also a number of "near misses" (cases where states explored the option of cooperating on nuclear weapon programs but didn't proceed) that shed light on the relative influence of different causal factors on such decisions. While the literature on state-sponsored nuclear proliferation has improved markedly in recent years, there are still large gaps in the empirical record. In addition, the motivations and casual mechanisms driving this behavior remain murky.

My research seeks to advance our understanding of this phenomenon by drawing on a wider array of theories to explain why states share nuclear weapon technologies and providing more detailed case studies to better explain specific cases and highlight the relative influence of different causal mechanisms. This project utilizes three models—the national security model, the parochial interest model, and the cultural model—to explain why states share the technology to build nuclear weapons with other states. This three-fold theoretical framework provides the foundation for a systematic, comparative analysis of the motivations behind state-sponsored nuclear proliferation. The national security model is based on neorealism which posits that in order to survive in an anarchic international system states must arm themselves or ally with other states for protection against external threats.[10] Under this model, states engage in nuclear weapon cooperation for strategic purposes such as countering a shared enemy, to avoid an extended deterrence commitment, or to obtain vital military resources. The parochial interest model, based on liberal international relations theory, emphasizes the role of domestic sub-national actors, such as the military and the nuclear energy establishment, whose

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[6] T.V. Paul, "Chinese-Pakistani Nuclear/Missile Ties and Balance of Power Politics," *Nonproliferation Review*, Vol. 10, No. 2 (Summer 2003): 21-29; Peter Liberman, "Israel and the South African Bomb," *The Nonproliferation Review*, Vol. 11, No. 2 (Summer 2004): 1-35; Chaim Braun and Christopher F. Chyba, "Proliferation Rings: New Challenges to the Nuclear Nonproliferation Regime," *International Security*, Vol. 29, No. 2 (Fall 2004): 5-49; and Andrew J. Coe, "North Korea's New Cash Crop," *The Washington Quarterly*, Vol. 28, No. 3 (Summer 2005): 73-84.

[7] Matthew Kroenig, *Exporting the Bomb: Technology Transfer and the Spread of Nuclear Weapons* (Ithaca: Cornell University Press, 2009); and Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity* (Ithaca: Cornell University Press, 2012).

[8] Kroenig, *Exporting the Bomb*, 10-49.

[9] Kroenig does briefly examine two cases of potential nuclear suppliers, Israel and India, who have not provided sensitive nuclear assistance to other countries. Kroenig, *Exporting the Bomb*, 130-134.

[10] Kenneth Waltz, *Theory of International Politics* (New York: McGraw Hill, 1979).

objectives are to maximize their private gains.[11] These actors engage in nuclear cooperation as a means of increasing their power, autonomy, and/or prestige. According to the cultural model, based on constructivist theories of international relations, the decision to provide sensitive nuclear assistance is a function of shared beliefs and identities, including religion and ideology, not necessarily what is in the national interest or best serves the material interests of decision-makers.[12]

It should be noted that none of the cases of state-sponsored nuclear proliferation uncovered to date can be explained wholly by any single model. Indeed, different models may have greater explanatory power at different phases of nuclear cooperation. Also, the motivations of the state providing the nuclear technology and the state receiving it may be different. Nonetheless, these models serve a practical purpose in differentiating the alternative causes of nuclear sharing and highlighting the conditions that lead to its initiation, continuation, and termination. This holistic approach is in line with what Peter Katzenstein has dubbed analytic eclecticism. According to Katzenstein, "The complex links between power, interest, and norms defy analytical capture by any one paradigm. They are made more intelligible by drawing selectively on different paradigms—that is, by analytical eclecticism, not parsimony."[13]

The heart of the project is a series of case studies drawn from the cases listed in the appendix that are designed to illustrate the strengths and weaknesses of the national security, parochial interest, and cultural models. These cases will be analyzed through a combination of process tracing, which traces the links between possible causes and observed outcomes within cases, and structured, focused comparison which applies a standardized set of general questions across cases.[14] The method of process tracing is well-suited to identifying the relative importance of different causal factors in a government's decision-making process and establishing the internal validity of a case study. The structured, focused comparison method is valuable for testing the validity of the three models across different cases and providing a basis on which to make generalizable findings. Cases will be selected for their historical importance, richness of primary and secondary sources, ability to test the explanatory power of the three different models, and policy relevance. The history of state-sponsored nuclear proliferation is also characterized by several cases where the donor had second thoughts and terminated its nuclear assistance prematurely. Such cases are particularly useful for capturing within-case variance among the different causal factors and providing insights into why states initiate and terminate nuclear cooperation.

State-sponsored nuclear proliferation presents not only an intriguing puzzle for international relations theory, but also a pressing challenge to policy-makers. This research is likely to be of interest to U.S., foreign and international officials who work on nuclear non-proliferation and regional experts

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[11] Andrew Moravcsik, "Taking Preferences Seriously: A Liberal Theory of International Politics," *International Organization*, Vol. 51, No. 4 (Autumn 1997): 528-530.
[12] Peter J. Katzenstein, ed., *The Culture of National Security: Norms and Identity in World Politics* (New York: Columbia University Press, 1996).
[13] Peter J. Katzenstein and Nobuo Okawara, "Japan, Asia-Pacific Security, and the Case for Analytical Eclectism," *International Security*, Vol. 26, No. 3 (Winter 2001/02): 154.
[14] Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (Cambridge, MA: MIT Press, 2005).

concerned with the consequences of the Iranian and North Korean nuclear weapon programs. In order to devise effective nonproliferation strategies, policy-makers need to understand what factors motivate states to share nuclear weapon technology and under what conditions such cooperation is more or less likely to take place. This project will provide policy-makers with a richer historical and theoretical context with which to view current and future cases of state-sponsored nuclear proliferation. For example, this project will provide a framework for analyzing the risk that Iran would provide sensitive nuclear assistance to other states. The three models used in this project can also be used to analyze the potential motives for a state to transfer fissile material or nuclear weapons to a terrorist group. Since an event of this kind has never occurred it is necessary to study the closest analog to such behavior. Understanding what has motivated and deterred states from sharing nuclear technology with other states will further the debate on the risk of state-sponsored nuclear terrorism. Overall, these contributions will enable policy-makers to develop more effective strategies for halting nuclear proliferation and strengthening nuclear security.

APPENDIX. Cases of State-Sponsored Nuclear Proliferation

Supplier	**Recipient**	**Duration**	**Nature of Assistance**	**Outcome**
United Kingdom	United States	1941-1942	Warhead Design	Completed
United States	United Kingdom	1943-1946	Enrichment, Reprocessing, Warhead Design	Terminated by the United States
France	Israel	1956-1960	Reactor, Reprocessing	Terminated by France
Soviet Union	China	1957-1960	Enrichment, Reprocessing, Warhead Design	Terminated by the Soviet Union
United States	United Kingdom	1958-present	Warhead Design	Ongoing
United States	France	1972-present	Warhead Design	Ongoing
China	Pakistan	1976-?	Fissile Material, Warhead Design, Reprocessing	Ongoing?
China	Algeria	1983-1997	Reactor, Reprocessing	Completed
Pakistan	Iran	1987-1999	Enrichment	Unknown
Pakistan	North Korea	1997-2001	Enrichment	Unknown
Pakistan	Libya	1995-2003	Enrichment, Warhead Design	Terminated by Libya
North Korea	Syria	2000-2007	Reactor	Reactor destroyed by Israel

4. John Park, MIT

How Effective are Financial Sanctions as a Counterproliferation Policy Tool? The Case of North Korea

OBJECTIVES

The primary objectives of this research project are to analyze the different types and applications of counterproliferation-focused financial sanctions, assess the main intended and unintended effects of these measures on North Korea, and examine policy implications for counterproliferation efforts going forward.

OVERVIEW

Since the early 2000s U.S. policymakers have been placing greater emphasis on and increasing the use of financial sanctions as a counterproliferation policy tool – particularly in the case of North Korea. Most analyses of DPRK financial sanctions correlate reduced proliferation-linked commercial activities with higher transaction costs for targeted DPRK companies resulting from wider application of these measures. While this initial impact is a negative one for the DPRK regime, the secondary effect is turning out to be beneficial for them. Cognizant of reduced areas of movement for DPRK entities, private Chinese companies command higher commission fees for conducting commercial activities on behalf of DPRK clients. My preliminary research indicates that this, in turn, creates an incentive structure where larger Chinese companies actively seek out North Korean clients. This trend is accelerating due to more DPRK state trading companies setting up operations in major Chinese transportation and commercial hubs.

Although the incidence of North Korea's procurement activities may be declining in their traditional markets in Europe and the Middle East, the sophistication of this Sino-DPRK coping mechanism appears to be growing – i.e., deals are becoming more sophisticated in structure and less prone to detection. That does not bode well for North Korea-focused counterproliferation efforts. Policymakers need to revisit the assertion that sanctions can be effective in changing the calculus of targeted regimes like North Korea, but require patience.

RESEARCH DESIGN

A key feature of this project will be addressing the sender bias of the literature, which refers to studies written from the perspective of the sanctioning actor ("sender").[15] Through case study interviews with former DPRK state trading company officials I will examine how these firms evade sanctions measures in order to better understand the strengths and weaknesses of this counterproliferation policy tool and to develop policy recommendations for bridging widening gaps resulting from its application.

RESEARCH PRODUCT

Based on the main findings from this research project, I plan to write and submit a manuscript for publication consideration in a refereed journal in the international security field. I will also tailor early

[15] Drezner, D. W. (2011), "Sanctions Sometimes Smart: Targeted Sanctions in Theory and Practice." *International Studies Review*, 13: 96–108.

drafts for seminar, workshop and conference papers in order to receive feedback during the editing stage.

TARGET AUDIENCE

In the course of designing and running Track 1.5 policy dialogues at the U.S. Institute of Peace, I cultivated stakeholder relationships with Asia- and nuclear proliferation-focused policymakers and advisers at the Departments of State, Defense and the Treasury; the National Security Council; Congressional committees; and think tanks. I plan to brief these officials on the key findings and policy recommendations generated from this research project.