

# INTERNATIONAL CONTROL OF NUCLEAR PROLIFERATION: BEYOND CARROTS AND STICKS

by Ronald B. Mitchell<sup>1</sup>

*Ronald B. Mitchell is an assistant professor in the Department of Political Science, University of Oregon. His book **Intentional Oil Pollution at Sea: Environmental Policy and Treaty Compliance**, published in 1994 by The MIT Press, received the 1995 International Studies Association Sprout Award for best book on international environmental politics. He has published articles in **International Organization** and **The Journal of Theoretical Politics**.*

Recent changes in “political, economic, and technological conditions” have made “problems of proliferation more challenging than ever”<sup>2</sup> and called into question whether traditional policies and old assumptions will effectively constrain nuclear proliferation. Policymakers seeking to maintain and improve the Treaty on the Non-proliferation of Nuclear Weapons (NPT) regime have demonstrated that they are “prepared to expand their repertoire” of policies to fight nuclear proliferation, e.g., rewarding North Korea and former Soviet states for foregoing nuclear ambitions.<sup>3</sup> The skepticism of some scholars that these new policies will achieve their intended objectives<sup>4</sup> raises important theoretical questions regarding the relative effectiveness of different strategies for promoting nonproliferation, and the conditions

under which these strategies might succeed.

Nonproliferation efforts have already included policies that go beyond simple “carrot and stick” approaches. Technology denial policies have sought to prevent nuclear technology purchases rather than merely deter them through sanctions. Nuclear-weapon-free zones have sought to establish norms against the acquisition of nuclear weapons without even attempting to establish supporting sanctions or rewards. Of the states considered as likely proliferants during the quarter century since negotiation of the NPT, most have failed to acquire nuclear weapons, several have explicitly renounced nuclear weapons programs and accepted international or regional inspections, and the remaining few have made considerably slower progress towards nuclear weapons

than most analysts predicted.<sup>5</sup> A cautious assessment of this history might conclude that regime policies can take credit for some, though probably not all, of these “successes.”<sup>6</sup> Yet, identifying the source of this apparent effectiveness at inducing restraint requires a more refined taxonomy of policies than currently available and correspondingly more careful attention to the causal pathways the particular policy used in any given case.

International relations scholars have analyzed nonproliferation policies largely within a theoretical framework that “shoe-horns” an empirically diverse array of policies into two categories of either carrots or sticks.<sup>7</sup> Thus, a diversity of empirical policies are analyzed through a dichotomous theoretical lens. Framing the primary, if not exclusive, policy options as altering the consequences

of proliferation by threatening sticks or promising carrots creates several problems. It causes analytical neglect or misinterpretation of the processes by which existing policy actually influences behavior, especially in cases in which policies alter opportunities or perceptions rather than consequences. A framework limited to “carrots and sticks” also ignores recent theoretical developments highlighting the role that capacity, ideas, and norms play in state decisionmaking.<sup>8</sup> Finally, it constrains creative, systematic design of untried—but potentially effective—nonproliferation policies.

This article develops a taxonomy that goes beyond the “logic of consequences” inherent in the behavioral models of carrots and sticks.<sup>9</sup> Rather than treat the opportunities, information, ideas, and norms that influence a state as givens,<sup>10</sup> this taxonomy accounts for the ways in which regime members can influence and have influenced proliferation decisions by consciously manipulating the opportunities would-be proliferants face, the information those states have, and even the goals those states seek. Proliferation can be constrained via causal mechanisms that differ significantly from those involved when using sanctions or rewards. A state’s decision to pursue nuclear acquisition certainly depends on the expected sanctions of “going nuclear” and the rewards of remaining nonnuclear. However, it also depends on the state’s opportunities for proliferation and normative perceptions of how proliferation influences its “interests.”

This article argues that regulatory strategies can be classified into six ideal types based on the mechanisms by which they influence behavior:

*deterrent, remunerative, preventive, generative, cognitive, or normative.*<sup>11</sup> Regimes often combine these strategies, with different (and perhaps greater) effects on behavior than would be predicted from examining each of the strategies in isolation. However, elaborating these ideal types establishes theoretical expectations regarding the relative effectiveness of these different strategies under different conditions. In particular, we can expect these six strategies to be differentially influenced by a potential proliferant’s commitment to regime norms, its capacity to fulfill regime rules, the regime’s transparency, and strategy-dependent implementation difficulties. After delineating major characteristics and examples of each of the six strategies, the article generates tentative propositions regarding how policy effectiveness is influenced by the interaction between strategy choice and different conditions a regime might face.

## SIX STRATEGIES OF SOCIAL CONTROL

Since no standard categories of regime type exist in the political science literature, the present article draws from existing sociology and public policy literature to develop a six-part typology of the regulatory strategies that members design into regimes to alter behavior. The first pair of strategies, *deterrent* and *remunerative* strategies—sticks and carrots—manipulate the consequences a potential proliferant faces in an attempt to make desirable behavior more attractive or undesirable behavior less attractive. The second pair—*preventive* and *generative* strategies—reduce a potential proliferant’s opportunities for unde-

sirable behavior or increase the opportunities for desirable behavior. The final pair of *cognitive* and *normative* strategies alter the potential proliferant’s perception of a given reality, either by altering the information would-be proliferants have or the value that they attach to certain behaviors and consequences.

### Deterrent Strategies

Deterrent strategies are common in regulatory regimes. Deterrent strategies involve sanctions, threats, coercion, and other efforts to discourage undesirable behavior by increasing its costs.<sup>12</sup> Calls for “treaties with teeth” and for better monitoring, verification, and enforcement highlight the appeal of deterrent strategies and the common view that most treaties would be more effective if only states properly implemented them. Indeed, Downs, Rocke, and Barsoom recently have argued that deterrent strategies, including credible commitments to sanction noncompliance, are the only strategies that can ensure high levels of compliance.<sup>13</sup>

Deterrent strategies usually: a) clearly delineate proscribed behavior; b) establish mechanisms to identify such behavior as (or after) it occurs; and c) establish mechanisms to impose costs on noncompliers. Deterrent strategies may vary with respect to the types of costs imposed (e.g., military sanctions, economic boycotts, diplomatic threats), the actors imposing them (e.g., governments, publics, non-governmental organizations (NGOs), or the media), and the strength of the incentives actors have to identify and sanction proscribed behavior. Deterrent strategies assume that proliferants intentionally choose to engage in an

undesirable behavior because they value the consequences of that behavior more than those of available alternatives and lack an adequate commitment to regime norms. The model also assumes that potential proliferants have adequate capacity to engage in desirable behaviors. Under such strategies, transparency regarding potential proliferant behavior is required to prompt regime members to sanction deviant actors. However, the sanction threat creates strong incentives to conceal deviant behavior, thus frustrating efforts to achieve transparency. Sanction threats also may lack credibility, potency, or both. Internationally, the lack of an overarching government makes centralized enforcement impossible, and the cost of sanctions and problems of collective action make decentralized enforcement unlikely.<sup>14</sup> In many regimes, when sanctions are imposed, they are too small to counter the likelihood that undesirable behavior will go undetected, especially when political exigencies limit the size of sanctions. Even successful deterrent strategies, because they must “specify minimum conditions of performance” and because they may create “reactive resistance,” fail to induce member states to achieve “higher levels of aspiration.”<sup>15</sup>

Nuclear proliferation cases usually fit this model’s assumptions well, but experience demonstrates the ubiquity of the problems noted. States clearly develop or procure nuclear weapons intentionally; they could choose not to. But, most states also have the capacity and incentives to conduct programs clandestinely, creating pressure for extensive and expensive monitoring programs that nonetheless fail to identify prolifera-

tion efforts promptly. When incontrovertible evidence of proliferation efforts, whether by an NPT member (e.g., Iraq, North Korea) or non-member state (e.g., India, Israel, Pakistan), has become available, even states committed to nonproliferation have found it politically difficult to invoke credible and potent sanctions. The failure of NPT and IAEA efforts in Iraq provides dramatic evidence of the difficulty of detecting proliferation efforts by a state with strong incentives and capacities for deception. It also highlights the difficulty of threatening sanctions adequate to alter a determined state’s behavior. Indeed, the strength of Iraq’s nuclear ambitions suggests that no form of deterrent strategy could have succeeded: Iraq was essentially undeterrable.<sup>16</sup> The perception that strong benefits accrue from proliferation usually dwarfs any countervailing sanctions other states can be expected to impose. Notably, however, “second order” deterrent strategies may play important roles in nonproliferation policy if used to induce nuclear exporters to refrain from or closely control particular nuclear technology transfers, providing the foundation for a “first order” strategy aimed at preventing (rather than deterring) proliferation.

### Remunerative Strategies

Efforts to halt proliferation have increasingly adopted remunerative strategies to make desirable behavior more attractive by increasing its benefits (or reducing its costs).<sup>17</sup> Side payments or rewards can influence those who could fulfill regime commitments but would otherwise not do so. Remunerative strategies usually create: a) clear standards of desirable behavior; b) identify those

engaged in it; and c) reward them for doing so. They may vary in the type of rewards provided, the type of actors providing those rewards, and the structure of incentives those actors have to provide them. Rewards are assumed to affect behavioral changes either when potential proliferants view compliance as desirable but costly, or when they do not value compliance but do value the side payments.<sup>18</sup> Thus, the strategy assumes potential proliferants are capable of fulfilling regime norms, but reluctant to do so. Transparency is crucial to successful remunerative strategies, since regime members must be able to distinguish whom to reward. Unlike deterrent strategies, however, remuneration induces actors to volunteer, rather than hide, information.<sup>19</sup> Remuneration also can foster innovation by creating a goal toward which actors strive,<sup>20</sup> and is perceived as less coercive and less of an infringement on sovereignty and free will.<sup>21</sup> Implementation problems include: a) the collective action problems of inducing actors to provide funding; b) the normative reluctance of regime supporters to reward recalcitrant actors; and c) the failure of available rewards to be sufficient to counter the benefits of the undesirable behavior.

Recent assistance to North Korea, Belarus, Kazakstan, and Ukraine to forego their nuclear weapons ambitions suggests that remuneration may be an important component in a comprehensive nonproliferation strategy. Canada, the European Union, Japan, Sweden, Switzerland, and the United States have all contributed to efforts to reward the former Soviet states for de-nuclearizing.<sup>22</sup> By the end of 1996, the three former Soviet states had relinquished all of their

nuclear warheads. Technical and financial compensation played a "key role" in Ukraine's dismantlements and an arguably lesser role in the actions of Kazakhstan and Belarus.<sup>23</sup> Ukraine would seem unlikely to have returned its inherited nuclear weapons to Russia without having negotiated compensatory security guarantees and economic aid.<sup>24</sup> Similarly, Japan, South Korea, the United States, the European Union, and many other states have contributed to the \$4.5 billion program to induce North Korea to forego its nuclear weapons ambitions.<sup>25</sup> Whether North Korea will fulfill all terms of the Agreed Framework will not be known until well into the next century. Even if Pyongyang complies, distinguishing the role that compensation (as opposed to threats of economic sanctions) played in any observed change in North Korean behavior will prove difficult.

Such strategies face unique problems, however. Acceptance of these rewards does not preclude a state from continuing to pursue proliferation. The strategy also has the distasteful characteristic of rewarding states that break the international norm against proliferation, thereby creating incentives for extortion attempts and moral hazard. Given these factors, states will often resist providing large-scale rewards to proliferants, even if doing so would effectively alter their behavior.

### Preventive Strategies

Preventive strategies seek to eliminate the choice of noncompliance as an option rather than making it less attractive. Although rational choice theory usually urges the simplifying assumption that the alternatives available to a potential

proliferant be viewed as a given, institutions can modify the alternatives a would-be proliferant faces, either by reducing undesirable options (preventive) or increasing desirable ones (generative).<sup>26</sup> Technology denial regimes regulating nuclear weapons, nuclear power, and other military technologies, attempt to prevent (rather than deter) "have-nots" from acquiring certain technologies.<sup>27</sup> Such strategies rely on a process of prohibiting precursor behaviors that regime members can more readily control and that, if prevented, also prevent the ultimately important undesirable behavior, namely proliferation.

Preventive strategies usually: a) clearly delineate proscriptions of precursor acts that themselves are not directly undesirable; b) use "premonitory surveillance" to detect acts before, rather than after, they occur<sup>28</sup>; and c) make efforts to reduce the autonomy of a potential proliferant to engage in the undesirable behavior. Preventive strategies make similar behavioral assumptions to deterrent strategies, assuming potential proliferants lack a strong commitment to regime norms rather than the capacity or opportunities to fulfill them. However, preventive strategies can reduce the transparency and monitoring problems that plague deterrent strategies by proscribing behaviors that are inherently transparent and costly to conceal. For example, negotiators have sought to regulate *trade* in nuclear weapon and missile technology at least in part because of the greater ease of identifying illegal cross-border nuclear materials transfers than of identifying subsequent diversion of nuclear material. Implementation problems arise when regime supporters lack

the capacity or commitment to identify and prevent potential proliferants from engaging in the precursor activities or the undesirable behavior itself. Preventive strategies are impotent against potential proliferants that have autonomous control over the targeted behavior and its precursor activities, a particular problem in proliferation threats by states that have or can develop indigenous capabilities to design and build nuclear weapons. Thus, wealthier and more powerful states will be less susceptible to such strategies than developing states. Preventive strategies also commonly must rely on reinforcing strategies to address cases in which prevention fails.

But preventive strategies have been an important line of defense in nonproliferation. Article IV of the NPT, of course, has sought to promote the transfer of nuclear technologies, so long as they were not diverted for military purposes. However, when such "end-use deterrents" seem unlikely to stop diversion, more directly preventive strategies of technology denial have been adopted.<sup>29</sup> At different points in time, the now-defunct Committee for Multilateral Export Controls (COCOM), the London Suppliers Group, the Wassenaar Arrangement, and individual national regulations have embargoed exports of particular technologies "to prevent the acquisition of armaments and sensitive dual-use items for military end-uses," if IAEA safeguards were absent or if the "situation in a region or the behavior of a state is, or becomes, a cause for serious concern to the Participating States."<sup>30</sup> Such technology denial seeks to control "militarily critical technology, such as uranium enrichment, as a means to control the

spread of nuclear weapons.”<sup>31</sup>

These efforts to foreclose opportunities for nuclear purchases appear to have slowed or prevented some nuclear development programs. For example, U.S. pressure successfully frustrated Iran’s attempts to purchase nuclear equipment “from Argentine, Chinese, European and Indian sources” during the early 1990s.<sup>32</sup> Likewise, the London Suppliers Group made it “extraordinarily difficult for Pakistan and Iraq to get their weapons programs into full swing, and certainly delayed them. Nonetheless, such restraints did not prevent Pakistan from eventually achieving its objective, and would not have prevented Iraq if the 1991 war had not intervened.”<sup>33</sup> A strategy of technology denial will not stop the weapons programs of states with strong, security-driven, nuclear ambitions, but it may slow progress in such programs by forcing them “to rely on indigenous capabilities and covert activities.”<sup>34</sup> Of course, the success of such strategies depends not only on the strength of such indigenous capabilities, but also on the effectiveness of the “second order,” precursor, strategies used to achieve technology denial. Successful prevention requires eliminating both indigenous and foreign means of acquiring nuclear weapons. Precluding indigenous development is almost impossible to achieve; even precluding foreign procurement has proved quite difficult. These latter failures usually arise from the failure of the “second order” sanctions used to deter corporations or foreign governments from making controlled materials available, rather than from the failure of the preventive strategy itself. Successful resolution of such implementation difficulties offers the

promise of “locking the barn door before the cows escape.” However, accomplishing this may be difficult and the possibility of developing indigenous nuclear capabilities means that a preventive strategy, by itself, can at best only delay proliferation.

### Generative Strategies

Generative strategies complement preventive ones by generating or creating new—rather than removing existing—opportunities from the choices available to potential proliferants. Such strategies address undesirable behaviors that result from incapacity; in these cases, threats, rewards, or prevention will be unlikely to alter behavior. Generative strategies can address incapacities involving systemic opportunity deficits or the specific opportunity deficits of particular states. The former strategy assumes that “if we create the opportunity, they will use it,” while the latter assumes that the opportunity exists but certain potential proliferants lack the resources to avail themselves of it. The difference is captured in the contrast between technology development and technology transfer programs: e.g., the International Atomic Energy Agency’s promotion of the development of safer nuclear reactors is an attempt to redress systemic incapacities. Transfers of existing nuclear technologies to particular states attempt to redress a particular state’s incapacities. At the margin, generative strategies merge into remunerative strategies, but the former alter behavior by creating previously unavailable choices, rather than changing the consequences of existing choices.

Unlike remunerative strategies, generative strategies target capac-

ity deficits, focusing on potential proliferants who want to but cannot alter their behavior because they lack appropriate alternatives. Transparency serves to assure those actors providing the opportunities that potential proliferants will not appropriate the funds without fulfilling regime commitments. Generative strategies face the same implementation problems as remunerative ones of inducing wealthier regime members to fund new opportunities. Creating new opportunities for socially desirable behavior also may not reduce socially undesirable behavior if the two are not mutually exclusive. For example, generative programs “intended to make [nuclear power plants] slightly safer for a short period of operation until Eastern [European] states can implement plans for shutdown has the unintended effect of prolonging the operations of the more dangerous” nuclear power plants.<sup>35</sup>

Generative strategies are best illustrated by the defense conversion, industrial partnerships, and the international science and technology centers in Moscow and Kyiv funded by the United States, Canada, and Sweden.<sup>36</sup> These projects have created over 5,000 new job opportunities for former weapons scientists “who might otherwise be tempted to sell their nuclear expertise abroad.”<sup>37</sup> In contrast to a remunerative strategy of increasing salaries to alter the incentives of nuclear scientists and technicians with respect to their existing choices, these generative projects are creating new alternatives that would not otherwise exist. The U.S. Nunn-Lugar Cooperative Threat Reduction (CTR) Program has aspects of both generative and remunerative strategies, providing former Soviet states with otherwise

unavailable services, tools, and technologies for dismantling nuclear weapons, as well as providing what looks more like direct compensation for doing so.<sup>38</sup> The resources involved undoubtedly have made nuclear weapons removal and dismantling safer than it would have been otherwise.<sup>39</sup>

Of course, to alter behavior, the new alternatives must be more attractive than the existing ones. Sometimes the attractiveness lies in the nature of the alternative, e.g., once the former Soviet states became willing to return warheads to Russia, their internal incentives for safe removal and dismantlement ensured that they would avail themselves of any safer American technology and know-how made available. At other times, however, the new alternative must be made both available *and* attractive. For example, the United States induced Sweden to abandon its nuclear weapons program in the 1950s by self-consciously making proprietary, civilian, light water reactor technology available at a price designed to make it more attractive than the heavy water reactor technology they had already developed.<sup>40</sup> Making a weapons-incompatible civilian nuclear power technology available and attractive to the Swedes effectively delinked the civilian and military nuclear programs. It thus increased the costs and reduced the attractiveness of the latter program. Similarly, security guarantees extending the American nuclear umbrella provided Western Europe with a policy option that allowed it to achieve its security objectives without resort to developing a nuclear weapons capability. Similar generative strategies would include conventional weapons

transfers to help states achieve their security goals without resort to nuclear weapons development.

### Cognitive Strategies

Regimes incorporating cognitive strategies provide potential proliferants with new, more complete, and more accurate information that can facilitate more intelligent decisions that favor socially desirable behaviors. The information can relate to the alternatives available, the causal relationship between behaviors and consequences, the costs and benefits of different behaviors, the current state or likelihood of various important decision parameters in the world, or the likely behavior of other actors. These strategies can rely on regime members to generate and disseminate the information themselves, to encourage others to generate and disseminate the information, or to mandate that others provide information in the course of private transactions. At least part of the diplomacy within the nonproliferation arena has involved the effort to provide non-nuclear states with information to convince them that adding nuclear weapons to their arsenal will not actually increase their security, and that they can increase their security more through other means.

Cognitive strategies both lack clear behavioral prescriptions or proscriptions and focus on creating and disseminating information. Regime members may view such strategies as more effective or simply as least common denominator strategies that evoke less opposition during regime negotiation. Cognitive strategies assume potential proliferants support regime norms and can fulfill regime requirements. The model assumes that potential proliferants pursue

nuclear weaponry because they mistakenly believe it to be beneficial to their own security and that new information will induce them to renounce undesirable behavior. Monitoring potential proliferant behavior becomes unnecessary since actors serve as "their own ubiquitous inspectors."<sup>41</sup> Implementation costs decline since altering information about consequences or opportunities usually costs far less than altering those consequences themselves. Cognitive strategies tend to fail when regime members institute them as cheap and nonintrusive ways to "do something," rather than because inadequate information is truly the source of undesirable behavior. Armed with better information, governments—and the foreign and domestic corporate and private actors that support those governments weapons procurements—can more accurately identify whether and how conformance with regime norms will further their individual interests.

Efforts to clarify the financial, technical, and safety risks and costs of nuclear weapons development, production, and deployment programs constitute attempts at cognitive strategies. A more aggressive cognitive strategy could provide military intelligence to reassure a state that its rivals are not proceeding with nuclear development programs, thereby reducing its incentives to procure or develop nuclear weapons.<sup>42</sup> Indeed, such strategies might reduce the chances for "missile gap" type arms races driven by inaccurate information. In these ways, states may become convinced not to undertake a nuclear development program that would otherwise appear to be desirable. Such strategies seem unlikely to avert many decisions to pursue

nuclear weaponry. However, they may be important elements of a strategy designed to encourage safe development, production, and deployment after the “go nuclear” decision has been made. Indeed, those pessimistic that nuclear proliferation can be stopped have recommended that existing nuclear powers provide the information necessary for emerging nuclear powers “to secure their deterrents...[and] understand the nature of the forces they are acquiring.”<sup>43</sup>

### Normative Strategies

Normative strategies change behavior by altering potential proliferants’ deep-seated *values* rather than the instrumental incentives that more proximately determine potential proliferant decisions and actions. Regimes establish normative strategies to induce potential proliferants to “change their practices because they have come to understand the world in a way that promotes certain actions over others.”<sup>44</sup> Normative strategies involve either collective or hierarchical efforts at consciousness-raising. During regime negotiations and recurring meetings, “leader” states may try to convince “laggards” to accept their norms of behavior, or regime members may work together to focus attention on a problem, create new collective norms, and increase member commitment to existing norms. Essentially, normative strategies involve rhetorical attempts to persuade potential proliferants not merely to adopt different means to their pre-existing goals, as in a cognitive strategy, but to adopt new goals.

Regimes using normative strategies: a) establish broad hortatory goals with few specific proscribed

or proscribed activities; b) avoid attempts to alter the opportunities or consequences that potential proliferants face; and c) establish ongoing procedures for dialogue among regime members and between members and potential proliferants to promote regime norms. Normative strategies assume that potential proliferants’ values are inconsistent with regime norms but are susceptible to policy manipulation, that potential proliferants have the capacity to adopt desirable behaviors, and that they will do so once their lack of a commitment to regime norms can be remedied through normative dialogue and education. As with cognitive strategies, transparency is not a prerequisite, since normative strategies “can begin to influence an actor as soon as an act is contemplated and before it is committed, whereas social disapproval and formal punishment can only be mobilized after the event and only in circumstances where others acquire evidence of who committed the act.”<sup>45</sup> Normative strategies face the implementation obstacles posed by the inherent difficulty of altering deeply held beliefs, resistance to “imperialist” efforts at normative re-education, and the time needed to induce first normative change and then any corresponding behavioral change. If successful, however, normative strategies promise wide-ranging, deep, and stable behavioral changes.

Debates held in the five-year reviews of the NPT regime have sought, at least in part, to convince the nuclear “have-nots” that nuclear weapons development would be morally wrong.<sup>46</sup> The indefinite extension of the NPT in 1995 and the recent signing of the Comprehensive Test Ban Treaty can be expected to

strengthen the rhetorical force of such normative arguments and ongoing compliance by its signatories will further strengthen the social legitimacy of the norm. Over time, the strength of such a norm and the corresponding stigma attached to violating it can create pressures to consider the “appropriateness”—rather than the consequences—of deciding to acquire nuclear weapons.<sup>47</sup> Similar dynamics have been observed or seem likely to develop in the Latin American, South Pacific, Southeast Asian, and African nuclear-weapon-free zones, which seek to take advantage of a current lack of strong nuclear incentives to establish more stable and predictable future security environments.<sup>48</sup> Such regimes help reduce each state’s fears that its neighbors are going nuclear, thereby reducing the pressures for reactive, short-term, “worst-case” defense planning that otherwise might make nuclear weapons attractive. Efforts to increase the priority given to economic and environmental issues while reducing that given to security issues (e.g., in the European Union) also appear to set into motion normative processes that help shape and reduce member states’ security concerns in general, and their interest in nuclear weapons in particular.

### FIVE TENTATIVE PROPOSITIONS

It would be foolish to seek to identify which of these six strategies is “the most effective” at forestalling proliferation. No regime does—or would be likely to—rely exclusively on only one of these strategies. Rather, the taxonomy provided here

delineates a collectively exhaustive range of strategies regime members can institute *in combination* to induce behavioral change. In addition, determining that one strategy was more “successful” than another would require, at least conceptually, that other factors be held constant. Yet, the choice of strategy is likely to depend on the likelihood of behavioral change. For example, even if evidence showed cognitive strategies effectively discouraged proliferation by the states they targeted while deterrent strategies failed to deter proliferation by the states they targeted, this finding might well be due to cognitive strategies targeting states that were less predisposed to going nuclear than those targeted by the deterrent strategy.

These difficulties do not preclude us, however, from identifying differences among the strategies that are likely to influence their relative effectiveness. This section, therefore, develops five tentative propositions regarding the interplay between factors deemed important by existing theories of regime effectiveness and the strategies posited as important here. The first three hypotheses argue that the influence certain factors—proliferant commitment to norms, proliferant capacity, and regime transparency—have on a regime’s effectiveness depends on the strategy the regime employs. Two additional hypotheses compare the strategies with respect to the ease of implementation and the degree to which each encourages behavioral change beyond some minimum level.

*Proposition 1: Develop a taxonomy with sufficient nuance.* To understand which existing nonproliferation policies “work” and why they work, as well as to develop better

policies to forestall proliferation requires a taxonomy of policy types that achieves an appropriate balance between generalizability and accuracy. A taxonomy with too many categories frustrates efforts to see commonalities across policies, while taxonomies with too few categories miss important variation in the types of policies actually used and the sources of their effectiveness. This article has suggested a six-category taxonomy designed to rectify the current tendency to see all nonproliferation policies as either carrots or sticks. This taxonomy may not achieve the appropriate balance for certain policy or analytic purposes. However, policymakers and analysts should at least remain open to choosing and evaluating policies by reference to a broader array of policy types than a too-simple dichotomous one.

*Proposition 2: Consider whether the “recalcitrant” will respond to a given strategy differently than the “disinclined.”* It is obvious that “the more a state opposes a regime, the less likely it will be to comply with its dictates.” Less obvious, however, is how the validity of this claim depends on the strategy the regime adopts. The degree of a potential proliferant’s opposition to regime norms is less determining of that state’s behavior under some strategies than under others. If we consider states as lying on a spectrum reflecting whether their incentives to acquire nuclear weaponry are strong, weak, or nonexistent, we can imagine classifying them as being recalcitrant, disinclined to comply, or nonproliferants, respectively. Regime strategies need only seek to influence states in the first of these two groups, since states in the last group see non-

proliferation by themselves and by others as in their interests. However, the six strategies delineated here are likely to affect the recalcitrant differently than the disinclined.

On the one hand, the effectiveness of generative and cognitive strategies depends considerably on the degree of the potential proliferant’s opposition to regime norms. Generative and cognitive strategies are premised on the notion that potential proliferants do not strongly oppose regime norms, pursuing nuclear weapons programs only because they lack the capacity or information that would allow them to renounce such efforts. Therefore, creating new opportunities or disseminating new information would seem likely, at best, to alter the behavior of disinclined proliferants but would be very unlikely to alter the behavior of recalcitrant proliferants. On the other hand, the effectiveness of preventive strategies depends very little on the degree of opposition to regime norms of the potential proliferant. Preventive strategies, successfully implemented, can inhibit proliferation regardless of the degree of the potential proliferant’s opposition. Successfully foreclosing opportunities to buy nuclear technologies has slowed or prevented such purchases by recalcitrant states strongly motivated to acquire nuclear weapons, as well as by states merely disinclined to comply. Deterrent, remunerative, and normative strategies sit between these extremes. Deterrent and remunerative strategies can influence both the disinclined and the recalcitrant, but are likely to have more influence over the former than the latter—especially since both rewards and punishments will usually be quite small.<sup>49</sup> Indeed, recalcitrant states strongly committed to



acquiring nuclear weapons will be undeterrable (being willing to absorb threatened sanctions) and unbribeable (either being unwilling to accept rewards or doing so and renegeing on their side of the bargain). Normative strategies may avert some proliferation by creating increasingly legitimate and stable norms or "taboos" regarding what weapons are appropriate means of providing for national security.<sup>50</sup> Normative strategies will tend to be more effective at altering the interests of the disinclined than the recalcitrant, but may hold the potential to succeed against the latter over the long term.<sup>51</sup> The overarching point here is that the effectiveness of some strategies will be consistent across a variety of actors, whereas the effectiveness of other strategies will depend far more on the type of actor being targeted.

*Proposition 3: Consider how differentials in the capacity to comply with and to violate regime rules influence the response to a strategy.* Recent international relations scholarship has pointed out the role incapacity (as opposed to intentionality) plays in the noncompliance of many states with international regimes that require performance of certain actions.<sup>52</sup> The nonproliferation regime requires restraint rather than action, yet the capacity and opportunities to comply or violate regime rules still influence a potential proliferant's action. Regime strategies differ in the degree to which they shape the alternatives for compliance and noncompliance that are available. Preventive and generative strategies seek to shape these alternatives directly. Preventive strategies reduce noncompliance by removing opportunities to acquire nuclear technology. Strategies such

as technology denial have been particularly effective in dealing with states that lack strong indigenous technological skills but have strong nuclear ambitions, because they constrain the state's capacity to proliferate. Generative strategies address the proliferation decision as an instrumental decision made in pursuit of security and seek to provide alternative means of achieving that goal. Making otherwise unavailable alternatives sufficiently attractive, e.g., offering security guarantees or proprietary technologies, can lead domestic actors to reconsider a proliferation decision as no longer the most effective means of achieving policy goals. American technologies provided under the Nunn-Lugar (CTR) program allowed safer dismantlement and transport of nuclear weapons than would have been otherwise possible. Remunerative strategies, in practice, also may provide sufficient rewards for renouncing the nuclear option. This may make a potential proliferant reevaluate a prior assessment that such a decision was simply too risky.

In contrast, the other three strategies assume that the capacity of states to violate or comply with nonproliferation norms is given, beyond the reach of the regime's influence. In many (perhaps most) cases, such assumptions are justified. However, in others, deterrent strategies may serve to increase the costs of proliferating but not provide the proliferant an alternative means of achieving its policy goals (and hence *not* influence its behavior). Cognitive strategies provide information about alternatives but not the resources to undertake them. Normative strategies seek to induce potential proliferants to internalize regime goals, expect-

ing them then to find or develop the resources necessary to move toward those goals. These strategies ignore circumstances in which the regime can manipulate behavior by manipulating opportunities.

*Proposition 4: Transparency is always nice but not always crucial.* Regime transparency about actor behavior has consistently been touted as crucial to regime success.<sup>53</sup> Part of its importance derives from the common assumption that regime compliance requires a credible deterrent threat that, in turn, requires adequate monitoring and verification mechanisms.<sup>54</sup> In arms control in general and nonproliferation in particular, verification has been seen as the quintessential if not exclusive determinant of treaty compliance, even displacing discussions of whether and how other states should respond to a violation, once detected.<sup>55</sup> However, the degree to which regime success depends on transparency depends on the type of regime in question. Deterrent, remunerative, and generative strategies have demanding transparency requirements, because they are essentially contingent strategies. All three require that responses differ, depending on past behavior; regime members must know whether a potential proliferant fulfilled or ignored regime commitments in order to know how to respond. Effective deterrence, for example, requires that any significant weapons developments be identified and quickly sanctioned. Similarly, the effectiveness of rewards requires that they must cease as soon as evidence of renewed proliferation efforts becomes available. These strategies may induce perverse informational dynamics as well. Deterrent strategies

incline states to be even more secretive about their nuclear programs than security concerns alone would dictate. Remunerative and generative strategies may lead states to overstate their incentives and capacities to “go nuclear” in an effort to extort economic or technical assistance from those offering it.<sup>56</sup>

In contrast, preventive, cognitive, and normative strategies do not require that regime members respond differentially to potential proliferants based on past behavior, and therefore need fewer and weaker transparency mechanisms. These strategies may respond to different states differently based on their perceived likelihood of proliferation. But they do not require timely, accurate information about their behavior because changes in behavior do not require rapid changes in response. For example, preventive policies of technology denial that embargo any state posing even a minimal proliferation hazard, or cognitive and normative efforts to inform or engage in dialogue with states to shape their perceived interests, are probably most effective when they maintain a stable policy regardless of short-term changes in behavior.

*Proposition 5: Forecast implementation failures when predicting compliance.* Strategies to forestall proliferation are subject to two types of factors that can cause failure: “inherent” limitations and “implementation” limitations. The former arise from the inability of a strategy to induce a state to forego nuclear weapons even if regime supporters implement the strategy perfectly. The latter arise because regime supporters often do not implement the strategy they have negotiated. For example, a deterrent strategy might

fail to forestall proliferation efforts because states did not threaten credible and potent sanctions (implementation limitations). Such a failure might also arise, on the other hand, because even credible and potent sanctions induced a reactive resistance in the targeted state, reinforcing rather than undermining proliferation ambitions (inherent limitations).

The six strategies vary not only in their inherent limitations, but also in their implementation limitations. Choosing among strategies requires assessing not how potential proliferants will respond if each strategy were implemented perfectly, but how they will respond to each strategy given the likely level and form of implementation. None of the six strategies will be implemented perfectly, but the typical degree and form of imperfection will vary across regime strategies. Political, economic, and other costs create a gap between paper and practice that depends in “systematic” ways on the implementation requirements placed on regime supporters. Some strategies are simply more difficult to implement than others. The implementation gap is considerably smaller in preventive and cognitive strategies than with deterrent, remunerative, generative, and normative strategies. For example, states demonstrate a consistent reluctance to follow through on deterrent strategies that they negotiated because of the costs and collective action problems posed by international sanction efforts.<sup>57</sup> Inducing regime supporters to provide the resources needed for remunerative, generative, and normative strategies pose similar, if less severe, collective action problems. In contrast, we should expect member states to

implement preventive and cognitive strategies more fully, since they require fewer resources, pose fewer collective action problems, and evoke fewer specters of infringing sovereignty.

## CAVEATS AND FUTURE RESEARCH

Several caveats are in order. Though these strategies are conceptually distinct in terms of how they induce behavioral change, regimes usually will (and should) combine these strategies in efforts to maximize success. For example, linking deterrent threats and remunerative promises creates a double-edged reciprocity (or “tit-for-tat” strategy) that rewards desirable behavior and punishes undesirable behavior more effectively than either policy alone.<sup>58</sup> Although it runs counter to the international norm of sovereign equality, regime effectiveness might be increased by a carefully differentiated policy that responded to any particular proliferant with the strategy most likely to influence it. Indeed, the taxonomy developed here clarifies that “one size may not fit all,” and that true success requires an optimal set of strategies based on understanding systematically the range of potential strategies and their effectiveness under different circumstances and against different proliferants. Even if research could identify the “optimal” strategy (or combination of strategies) to forestall proliferation (an unlikely event in any case), such guidance would be unlikely to dictate policy. Many criteria other than “effectiveness at altering behavior”—alliance relationships, costs, likely retaliation—can and should determine what strategies are adopted.

Developing a taxonomy of strategies for influencing behavior is only a first step. This taxonomy and these propositions seek to identify available options and to think systematically about factors that influence their success. The taxonomy takes account of recent theoretical developments that draw attention to the variety of available levers for influencing behavior that go beyond carrots and sticks. Will options such as removing opportunities for proliferation, providing opportunities for non-nuclear security, providing information that convinces a state that nuclear weapons will not further its security goals, or building a norm through words and action that makes nuclear weapons increasingly illegitimate actually work? Do they perform better or worse than the usual menu of sanctions or rewards? In what ways does the influence of contextual factors—strength and type of nuclear ambition and capabilities, transparency, likely degree of implementation—vary across the available strategies? This article seeks to encourage a broad and creative debate regarding the strategies we can adopt to meet the new challenges of proliferation in the years ahead. Beginning to answer these questions through rigorous empirical analysis of both past nonproliferation experience and similar experience in other realms of international relations constitutes the task ahead.

## CONCLUSION

States can address proliferation threats through six ideal-type strategies: deterrent, remunerative, generative, preventive, cognitive, and normative. Although extant theoretical frameworks have often led us to interpret strategies as merely alter-

ing the costs and benefits of the proliferation/nonproliferation decision through deterrent sticks and remunerative carrots, nonproliferation strategies that have been and could be adopted prove far more diverse. Opportunities for proliferation can be closed off (preventive) and opportunities to achieve security goals without nuclear weapons can be created (generative). A potential proliferant can be given intelligence and technical information that reduces threat misperceptions and otherwise clarifies that proliferation involves greater risks and fewer benefits than it might have thought (cognitive). Over the long term, dialogue and action may even alter the underlying values and levels of concern that motivate proliferation (normative). These six categories provide the foundation for evaluating systematically the relative effectiveness of different strategies at altering behavior. This article has delineated the different paths by which these strategies influence behavior and generated tentative propositions regarding the factors that influence when they will be most effective at doing so. The strategies vary in the degree to which their effectiveness depends on the strength of the potential proliferant's nuclear ambitions, their capacity to "go nuclear," the transparency regarding proliferation activity, and implementation difficulties. A debate that goes beyond carrots and sticks when developing options and that evaluates the relative effectiveness of these policies will be crucial to successful efforts to combat nuclear proliferation threats in the decades ahead.

<sup>1</sup> An earlier version of this article was presented at the Workshop on Science and Modern Technology in Safeguards held in Arona,

Italy, from October 28-31, 1996, and sponsored by the European Safeguards Research and Development Association, the Joint Research Centre of the European Commission, and the Institute of Nuclear Materials Management. The article benefited greatly from comments received from Clay Moltz and two anonymous reviewers. Research support was provided through a Summer Research Award from the University of Oregon.

<sup>2</sup> Bates Gill, Kensuke Ebata, and Matthew Stephenson, "Japan's Export Control Initiatives: Meeting New Proliferation Challenges," *The Nonproliferation Review* 4 (Fall 1996), p. 30.

<sup>3</sup> Tanya Ogilvie-White, "Is There a Theory of Nuclear Proliferation? An Analysis of the Contemporary Debate," *The Nonproliferation Review* 4 (Fall 1996), p. 56.

<sup>4</sup> For a critical view of recent nonproliferation policy approaches, see Henry Sokolski, "Viewpoint: Next Century Nonproliferation: Victory is Possible," *The Nonproliferation Review* 4 (Fall 1996). For a more general critique of policies that are not based on sanctions, see George W. Downs, David M. Roche, and Peter N. Barsoom, "Is The Good News About Compliance Good News About Cooperation?," *International Organization* 50 (Summer 1996).

<sup>5</sup> Thomas Bernauer and Dieter Ruloff, "Analytical Framework," in Thomas Bernauer, Jozef Goldblat, and Dieter Ruloff, eds., *Soliciting Cooperation From Critical States: The Politics Of Positive Incentives In Arms Control* (Columbia: University of South Carolina Press, forthcoming), pp. 39-40; and Leonard Spector and Mark G. McDonough, *Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1995* (Washington, D.C.: Carnegie Endowment for International Peace, 1995).

<sup>6</sup> For recent discussions of "causes for optimism" regarding the unexpected reversal of some states' nuclear programs and the contrary-to-prediction slowness of nuclear proliferation by others, see Richard Kokoski, *Technology And The Proliferation Of Nuclear Weapons* (New York: Oxford University Press, 1995), p. 3; Mitchell Reiss, *Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities* (Washington, D.C.: Woodrow Wilson Center Press, 1995), p. 1; and Richard K. Betts, "Paranooids, Pygmies, Pariahs And Nonproliferation Revisited," in Zachary S. Davis and Benjamin Frankel, eds., *The Proliferation Puzzle: Why Nuclear Weapons Spread And What Results* (London: Frank Cass and Co., 1993), p. 111.

<sup>7</sup> See, for example, the papers presented in David Cortright and George Lopez, *Bombs, Carrots, and Sticks: The Use of Economic Sanctions and Incentives as a Means of Halting the Proliferation of Nuclear Weapons* (Goshen, IN: The Fourth Freedom Forum and The Joan B. Kroc Institute for International Peace Studies, 1993); as well as William J. Long, "Trade And Technology Incentives And Bilateral Cooperation," *International Studies Quarterly* 40

(March 1996); and A. Walter Dorn and Andrew Fulton, "Securing Compliance With Disarmament Treaties: Carrots, Sticks, And The Case Of North Korea," *Global Governance* 3 (January 1997).

<sup>8</sup> For recent works on the role of norms in defining national interests and international relations, see Martha Finnemore, *National Interests In International Society* (Ithaca, N.Y.: Cornell University Press, 1996); Alexander Wendt, "Anarchy Is What States Make Of It," *International Organization* 46 (Spring 1992); Richard Price, "The Genealogy Of The Chemical Weapons Taboo," *International Organization* 49 (Winter 1995); Audie Klotz, "Norms Reconstituting Interests: Global Racial Equality And U.S. Sanctions Against South Africa," *International Organization* 49 (Summer 1995); and Jeffrey W. Legro, "Which Norms Matter?," *International Organization* 51 (Winter 1997). On the influence of ideas and information, see Peter M. Haas, "Epistemic Communities And International Policy Coordination," *International Organization* 46 (Winter 1992); and Judith Goldstein and Robert O. Keohane, eds., *Ideas and Foreign Policy: Beliefs, Institutions, And Political Change*, (Ithaca, NY: Cornell University Press, 1993).

<sup>9</sup> Finnemore, *National Interests In International Society*, pp. 28-31.

<sup>10</sup> Models in the rational choice/game theoretic tradition tend to take both the preferences of the relevant actor and the structure of the choices available to an actor as "the givens of a situation, and, for purposes of analysis, we assume that they don't change much in the short run. In short, we take people as we find them" (Kenneth A. Shepsle and Mark S. Bonchek, *Analyzing Politics: Rationality, Behavior, and Institutions* (New York: W.W. Norton and Co., 1997)), pp. 16-17.

<sup>11</sup> This framework has been developed within a larger research project examining policy strategies across a range of international issue areas. See Ronald B. Mitchell, "Strategies of International Social Control: Changing Incentives, Opportunities, Or Values," paper presented at International Studies Association Conference held at San Diego, CA, 18-20 April, 1996.

<sup>12</sup> Gary S. Becker, "Crime and Punishment: An Economic Approach," *Journal of Political Economy* 76 (March/April 1968); Amitai Etzioni, *A Comparative Analysis Of Complex Organizations: On Power, Involvement, And Their Correlates* (New York: The Free Press of Glencoe, Inc., 1961); Keith Hawkins, *Environement and Enforcement: Regulation And The Social Definition Of Pollution* (Oxford, England: Clarendon Press, 1984); and Albert J. Reiss, Jr., "Selecting Strategies of Social Control Over Organizational Life," in Keith Hawkins and J.M. Thomas, eds., *Enforcing Regulation* (Boston: Kluwer-Nijhoff, 1984).

<sup>13</sup> Downs, Rocke, and Barsoom, "Is The Good News About Compliance...."

<sup>14</sup> Robert Axelrod and Robert O. Keohane,

"Achieving Cooperation Under Anarchy: Strategies And Institutions," in Kenneth Oye, ed., *Cooperation Under Anarchy* (Princeton, N.J.: Princeton University Press, 1986); and Gary Clyde Hufbauer, Jeffrey J. Schott, and Kimberly Ann Elliott, *Economic Sanctions Reconsidered: History And Current Policy* (Washington, D.C.: Institute for International Economics, 1990).

<sup>15</sup> Eugene Bardach and Robert A. Kagan, *Going By The Book: The Problem Of Regulatory Unreasonableness* (Philadelphia: Temple University Press, 1982), p. 100.

<sup>16</sup> Although Iraq may have been "undeterable," its experience may have deterred other states with weaker nuclear ambitions. See Les Aspin cited in David J. Karl, "Proliferation Pessimism and Emerging Nuclear Powers," *International Security* 21 (Winter 1996/1997), p. 88.

<sup>17</sup> For an excellent, in-depth analysis of remunerative strategies with a special focus on the North Korea and Ukraine cases, see the articles in Bernauer, Goldblat, and Ruloff, eds., *Soliciting Cooperation...*; also Long, "Trade and Technology Incentives...."

<sup>18</sup> John K. Stranlund, "Public Mechanisms To Support Compliance To An Environmental Norm," *Journal of Environmental Economics and Management* 28 (March 1995), p. 206.

<sup>19</sup> Of course, the potential proliferant may overstate the extent to which they were likely to proliferate.

<sup>20</sup> Ian Ayres and John Braithwaite, *Responsive Regulation: Transcending The Deregulation Debate* (New York: Oxford University Press, 1992), p. 111.

<sup>21</sup> Long, "Trade And Technology Incentives...."

<sup>22</sup> Steven E. Miller, "The Former Soviet Union," in Mitchell Reiss and Robert S. Litwak, eds., *Nuclear Proliferation after the Cold War* (Washington, D.C.: The Woodrow Wilson Center Press, 1994), p. 114.

<sup>23</sup> John M. Shields and William C. Potter, "Cooperative Assistance: Lessons Learned and Directions for the Future," in John M. Shields and William C. Potter, eds., *Dismantling the Cold War: U.S. and NIS Perspectives on the Nunn-Lugar Cooperative Threat Reduction Program* (Cambridge, MA: The MIT Press, 1997), p. 387; and Thomas Bernauer, Stefan Brem, and Roy Suter, "The Denuclearization of Ukraine," in Bernauer, Goldblat, and Ruloff, eds., *Soliciting Cooperation...*, pp. 116 and 134. Indeed, initial Belarusian expectations of large-scale compensation that would benefit indigenous enterprises "have now been muted" Vyachaslau E. Paznyak, "Nunn-Lugar Program Assessment: The Case of Belarus," in Shields and Potter, eds., *Dismantling the Cold War*, p. 170.

<sup>24</sup> Michael H. Newlin, "Export Controls and the CTR Program," in Shields and Potter, eds., *Dismantling the Cold War*, pp. 294 and 299; Thomas Bernauer, Jozef Goldblat, and Dieter Ruloff, "Conclusions," in Bernauer, Goldblat,

and Dieter, eds., *Soliciting Cooperation...*; and Bernauer, Brem, and Suter, "The Denuclearization of Ukraine," p. 116. Kazakhstan's decision to dismantle its inherited nuclear weapons was "reinforced," if not determined, by the compensation it received; see William C. Potter, "Project Sapphire: U.S.-Kazakstani Cooperation for Nonproliferation," in Shields and Potter, eds., *Dismantling the Cold War*, p. 361; Mikhail Ustiugov, "Kazakh Power Play: Rich In Oil And Gas, Kazakhstan Nonetheless Wants Nuclear Power And Prestige," *Bulletin of the Atomic Scientists* 52 (July-August 1996); John W.R. Lepingwell, "Kazakhstan and Nuclear Weapons," *RFE/RL Research Report* 2 (February 19 1993); and "Report: First FY 1995 Semi-Annual Report on Program Activities to Facilitate Weapons Destruction and Nonproliferation in the Former Soviet Union," *The Monitor: Nonproliferation, Demilitarization and Arms Control* 1 (Summer 1995), p. 21.

<sup>25</sup> Amy E. Smithson, "North Korea," in Bernauer, Goldblat, and Ruloff, eds., *Soliciting Cooperation...*, p. 107; and Korean Peninsula Energy Development Organization, *Annual Report* (Korea: Korean Peninsula Energy Development Organization, 1995), p. 21. For an extensive chronology of the development of the Agreed Framework, see General Accounting Office, *Nuclear Nonproliferation: Implications of the U.S./North Korean Agreement on Nuclear Issues* (Washington, D.C.: U.S. Government Printing Office, 1996).

<sup>26</sup> Siegwart Lindenbergh and Bruno S. Frey, "Alternatives, Frames, and Relative Prices: A Broader View of Rational Choice Theory," *Acta Sociologica* 36 (Fall 1993), p. 197; and Shepsle and Bonchek, *Analyzing Politics*, p. 16-17.

<sup>27</sup> Michael Mastanduno, *Economic Containment: CoCom and the Politics of East-West Trade* (Ithaca, N.Y.: Cornell University Press, 1992).

<sup>28</sup> Reiss, "Selecting Strategies...."

<sup>29</sup> Mastanduno, *Economic Containment*, pp. 326-327.

<sup>30</sup> Arms Control and Disarmament Agency, *The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies* (Washington, D.C.: U.S. Arms Control and Disarmament Agency; <http://www.acda.gov/factsheet/cnwpan/wassenaar.htm>, 1997); Nuclear Energy Agency, *The Regulation Of Nuclear Trade: Non-Proliferation, Supply, Safety*, vol. 1 (Paris: OECD, 1988); and Gary K. Bertsch, Richard T. Cupitt, and Steven Elliott-Gower, "Multilateral Export Control Organizations," in Gary K. Bertsch, Richard T. Cupitt, and Steven Elliott-Gower, eds., *International Cooperation On Nonproliferation Export Controls: Prospects For The 1990s And Beyond* (Ann Arbor: The University of Michigan Press, 1994).

<sup>31</sup> Amy Sands, "The Impact Of New Technologies On Nuclear Weapons Proliferation," in Reiss and Litwak, eds., *Nuclear Proliferation...*, p. 260.

<sup>32</sup> David A. Schwarzbach, "Iran's Nuclear

Puzzle," *Scientific American* 276 (June 1997), p. 63.

<sup>33</sup> Betts, "Paranoids, Pygmies, Pariahs...", p. 114.

<sup>34</sup> Sands, "The Impact Of New Technologies...", p. 271; and Benjamin Frankel, "The Brooding Shadow: Systemic Incentives And Nuclear Weapons Proliferation," in Davis and Frankel, eds., *The Proliferation Puzzle*.

<sup>35</sup> Barbara Connolly and Martin List, "Nuclear Safety in Eastern Europe and the Former Soviet Union," in Robert O. Keohane and Marc A. Levy, eds., *Institutions for Environmental Aid: Pitfalls and Promise* (Cambridge, MA: MIT Press, 1996), p. 275.

<sup>36</sup> Bernauer, Brem, and Suter, "The Denuclearization of Ukraine," p. 139.

<sup>37</sup> U.S. Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, D.C.: U.S. Government Printing Office, 1996), p. 58; Miller, "The Former Soviet Union;" and Dorothy S. Zinberg, *The Missing Link? Nuclear Proliferation And The International Mobility Of Russian Nuclear Experts* (New York: United Nations, 1995).

<sup>38</sup> Miller, "The Former Soviet Union," p. 109. The U.S. government plans to spend over \$1 billion in its Cooperative Threat Reduction program, with approximately half of that going to Belarus, Kazakstan, and Ukraine (Defense Technology Information Center, *How CTR Works* (Washington, D.C.: U.S. Department of Defense; <http://www.dtic.mil/defense/links/pubs/ctr/how.html>, 1997)). On the CTR program more generally, see Shields and Potter, eds., *Dismantling the Cold War*.

<sup>39</sup> U.S. Office of the Secretary of Defense, *Proliferation: Threat And Response*.

<sup>40</sup> An excellent account of this policy is provided by Long, "Trade and Technology Incentives..."

<sup>41</sup> Bardach and Kagan, *Going By The Book*, p. 248.

<sup>42</sup> On assurance strategies, see Lisa L. Martin, *Coercive Cooperation: Explaining Multilateral Economic Sanctions* (Princeton: Princeton University Press, 1992).

<sup>43</sup> John J. Mearsheimer, "Back to the Future: Instability in Europe After the Cold War," *International Security* 15 (Summer 1990), p. 38.

<sup>44</sup> Paul Wapner, "Environmental Activism And World Civic Politics," *World Politics* 47 (April 1995), p. 337.

<sup>45</sup> Toni Makkai and John Braithwaite, "The Dialectics Of Corporate Deterrence," *Journal of Research in Crime and Delinquency* 31 (November 1994), pp. 360.

<sup>46</sup> For an excellent discussion of how normative forces have effectively eliminated the use of nuclear (and chemical) weapons as an American policy option, see Richard Price and Nina Tannenwald, "Norms and Deterrence: The Nuclear and Chemical Weapons Taboos," in Peter J. Katzenstein, ed., *The Culture of National Security: Norms and Identity in World Politics* (New York: Columbia University Press, 1996).

<sup>47</sup> Finnemore, *National Interests In International Society*, p. 29.

<sup>48</sup> Edmundo Fujita, *The Prevention Of Geographical Proliferation Of Nuclear Weapons: Nuclear-Weapon-Free Zones And Zones Of Peace In The Southern Hemisphere* (New York: United Nations, 1989); and Jozef Goldblat, "Nuclear-Weapon-Free Zones: A History And Assessment," *The Nonproliferation Review* 4 (Spring-Summer 1997).

<sup>49</sup> It is also worth noting that political exigencies will make the adoption of remunerative strategies unlikely in response to recalcitrant proliferants.

<sup>50</sup> Finnemore, *National Interests In International Society*, p. 29; and Price, "The Genealogy Of The Chemical Weapons Taboo."

<sup>51</sup> The effectiveness of such strategies will always, by definition, be difficult to determine: since normative strategies operate by leading states to redefine their interests, and since interests have theoretical primacy over regimes as determinants of state behavior, compliance will tend to be attributed to a happy coincidence of state interests with regime norms rather than the influence of regime policies.

<sup>52</sup> See, for example, Abram Chayes and Antonia Handler Chayes, *The New Sovereignty: Compliance With International Regulatory Agreements* (Cambridge, MA: Harvard University Press, 1995); Ronald B. Mitchell, *Intentional Oil Pollution At Sea: Environmental Policy And Treaty Compliance* (Cambridge, MA: The MIT Press, 1994); Peter Haas, Robert O. Keohane, and Marc A. Levy, *Institutions For The Earth: Sources Of Effective International Environmental Protection*, (Cambridge, MA: The MIT Press, 1993); and Keohane and Levy, *Institutions for Environmental Aid*.

<sup>53</sup> For a summary of arguments regarding the role of regime transparency and mechanisms for improving transparency, see Ronald B. Mitchell, "Sources of Transparency: Information Systems In International Regimes," *International Studies Quarterly* 42 (March 1998). For recent discussion of the virtues of transparency in the proliferation arena, see Charles W. Nakhleh, "Viewpoint: Addressing the Implications of the Japanese Fuel Cycle Through Transparency," *The Nonproliferation Review* 4 (Spring-Summer 1997).

<sup>54</sup> Downs, Rocke, and Barsoom, "Is the Good News About Compliance..."

<sup>55</sup> Fred C. Ikle, "After Detection—What?" *Foreign Affairs* 39 (January 1961), p. 208-220.

<sup>56</sup> Bernauer and Ruloff, "Analytical Framework," pp. 32-33.

<sup>57</sup> Axelrod and Keohane, "Achieving Cooperation..." and Martin, *Coercive Cooperation...*

<sup>58</sup> For the seminal work on "tit-for-tat" as a strategy for overcoming cooperation problems, see Robert Axelrod, *The Evolution Of Cooperation* (New York: Basic Books, 1984).