University of Reading

NPT as an antifragile system: how contestation improves the nonproliferation regime

Article

Published Version

Creative Commons: Attribution-Noncommercial-No Derivative Works 4.0

Open access

Smetana, M. and O'Mahoney, J. ORCID: https://orcid.org/0000-0002-6316-1771 (2022) NPT as an antifragile system: how contestation improves the nonproliferation regime. Contemporary Security Policy, 43 (1). pp. 24-49. ISSN 1352-3260 doi: 10.1080/13523260.2021.1978761 Available at https://centaur.reading.ac.uk/100398/

It is advisable to refer to the publisher's version if you intend to cite from the work. See Guidance on citing.

To link to this article DOI: http://dx.doi.org/10.1080/13523260.2021.1978761

Publisher: Routledge

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the End User Agreement.

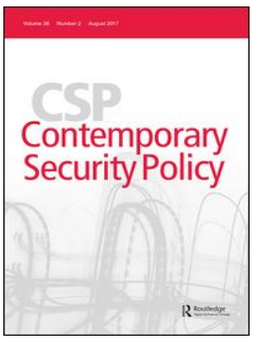
www.reading.ac.uk/centaur

University of Reading

CentAUR

Central Archive at the University of Reading

Reading's research outputs online



Routledge
Taylor & Francis Group

Contemporary Security Policy

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/fcsp20

NPT as an antifragile system: How contestation improves the nonproliferation regime

Michal Smetana & Joseph O'Mahoney

To cite this article: Michal Smetana & Joseph O'Mahoney (2021): NPT as an antifragile system: How contestation improves the nonproliferation regime, Contemporary Security Policy, DOI: 10.1080/13523260.2021.1978761

To link to this article: https://doi.org/10.1080/13523260.2021.1978761

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

Published online: 16 Sep 2021.

Submit your article to this journal

Article views: 200

View related articles

View Crossmark data

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=fcsp20

CONTEMPORARY SECURITY POLICY
https://doi.org/10.1080/13523260.2021.1978761

Routledge
Taylor & Francis Group

OPEN ACCESS Check for updates

NPT as an antifragile system: How contestation improves the nonproliferation regime

Michal Smetana [a] and Joseph O'Mahoney [b]

[a]Faculty of Social Sciences, Peace Research Center Prague, Charles University, Prague, Czech Republic; [b]University of Reading, Reading, UK

ABSTRACT

We introduce "antifragility" as a conceptual framework to understand the impact of occasional violations of regime norms on the health of respective regimes. Contrary to the prevailing understanding of norm violation as a strictly negative phenomenon that leaves regimes damaged, we show that normative deviance is, under certain conditions, a stressor that helps predominantly antifragile systems learn, improve, and adapt to changes in both internal and external environments. We apply this conceptual framework to the case of the NPT regime and the prominent violations of its nonproliferation norms by India in the 1970s (as a "contestation from outside") and Iraq in the 1990s (as a "contestation from within"). Our findings question the prevailing catastrophizing narrative about the strictly negative impact of norm violations on regime stability and contribute to contemporary scholarly debates about norm dynamics within the NPT.

KEYWORDS Nuclear weapons; nonproliferation; norms; deviance; international regimes; contestation

The international regime revolving around the nuclear Non-Proliferation Treaty (NPT) has been rightfully hailed as one of the most successful multilateral security arrangements in world politics. Except for five outliers, all countries are parties to the treaty. There is little doubt that the NPT has been instrumental in curbing the spread of nuclear weapons: Out of 31 states with the capability to build nuclear weapons, only ten countries have acquired them and only four of those did so after the signing of the treaty (Fuhrmann & Tkach, 2015). This pattern of restraint has held despite the widespread perception of nuclear weapons as the "currency of power" (Biswas, 2014; Harrington, 2009; Ritchie, 2019) and despite the fact that many countries have received sophisticated technology, know-how, and other sensitive assistance for their

CONTACT Michal Smetana smetana@fsv.cuni.cz, smetana.michal@gmail.com Faculty of Social Sciences, Peace Research Center Prague, Charles University, Smetanovo nabr. 6, Prague 110 00, Czech Republic

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (http://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

civilian nuclear programs that they could have potentially converted to military capability (Fuhrmann, 2009). And while nuclear-armed countries have fought wars, no nuclear weapon has exploded in anger since 1945 and nuclear strikes have been virtually unthinkable even during the most serious crises (Tannenwald, 2007)—in line with the NPT preamble that calls upon mankind to prevent the devastating nuclear war.

Despite these overwhelmingly positive patterns, the image of the NPT in the scholarly literature gives a strong impression of a regime that finds itself in a perpetual existential crisis (see Allison, 2010; Asculai, 2004; Doyle, 2017; Kittrie, 2007; Meyer, 2009; Miller, 2012; Müller, 2017; Pilat, 2007; Sauer, 2006; Thakur, 2011; and also Pretorius & Sauer, 2022; Noda, 2022; and Knopf, 2022 in this issue).[1] More often than not, the causal linkage behind the (almost) collapsing regime is tied to norms underpinning the NPT that are (once again) violated by the regime members and non-members; under this logic, every such violation represents a serious blow to the norm and consequently weakens the regime as such (e.g., Carranza, 2007; Goldschmidt, 2009; Huntley, 2006; Thakur, 2011; Walker, 2007). Whether it is a discovery of a clandestine nuclear program in Iran or a new nuclear test conducted by North Korea, it has been commonplace to claim that such a breach of a nonproliferation norm had seriously "damaged" the NPT and the next such act would likely be the final nail in its coffin.[2]

Why are we seeing these claims on repeat, yet the NPT regime still stands, in fact losing only one member (North Korea) from its ranks during the fifty years of its existence? We argue that the aforementioned portrayal of the regime dynamics rests on two problematic assumptions. First, that there is some quasi-automatic process in which a norm violation leads to the erosion or weakening of the norm in question. Second, that international regimes are systems that are inherently *fragile*—meaning that we can take steps to protect them using positive incentives, diplomacy, economic sanctions, deterrence, or even military force, yet once the norm violation occurs, the regime becomes a damaged good. Then, it would be just a matter of time before the regime collapses, as a result of being damaged too many times.

We propose that these two problematic assumptions have led to an inaccurate understanding of international regimes in general and the NPT regime in particular. Rather than conceptualizing the NPT as a fragile object undergoing continuous attrition, we argue that the regime is, to a large extent, an *antifragile* system. Taleb (2012) has developed the concept of "antifragility" as a quality of complex systems that "benefit from shocks [and] grow when exposed to volatility, randomness, disorder, and stressors." In his view, the challenges, stressors, and problems these systems face represent an important opportunity for learning, adaptation, and general improvement; they do not just survive these challenges, they, in fact, *need* them to get *better*.

Moreover, we build on the work of sociologists such as Émile Durkheim and Kai Erikson to show why the NPT, in the face of occasional violations of nonproliferation norms, remains an antifragile system that effectively adapts to new realities. We demonstrate that deviance from norms is not a strictly negative phenomenon but maintains an important function in society. Whereas a norm violation always represents a normative contestation, the outcome of such contestation does not necessarily make these norms weaker; it can also help society to reaffirm shared values, clarify (un)acceptable boundaries, consolidate mutual ties, and encourage social change (Macionis, 2012, p. 197). In world politics, these dynamics frequently clarify the meaning of international norms, reaffirm their validity and mutual hierarchy, and open a window of opportunity to promote and establish new rules and practices that make international regimes better adapted to internal and external developments (Smetana, 2020b, pp. 74–88; Smetana & Onderco, 2018).

We apply this conceptual framework to two empirical cases of nonproliferation norm violations that differ in the "deviant actor's" position vis-à-vis the NPT (non-member vs. member) and the stage of the regime's development (the 1970s, which is the decade when the NPT entered into force, and the 1990s, more than two decades after the regime's inception). Our first study analyzes the aftermath of India's 1974 "peaceful nuclear explosion" as a case of the "contestation from outside"; whereas India was (and still is) a non-signatory to the NPT, its actions were widely condemned and interpreted as a breach of supposedly universal nonproliferation norms and as a direct contestation to the NPT regime. The second case study concerns the discovery of Iraq's clandestine nuclear program in the 1990s, as a "contestation from within" (Iraq was at the time, and remains to be, an NPT signatory). In both cases, what was found a serious violation of shared norms led to an adoption of new initiatives, rules, and standards in nuclear nonproliferation, a reaffirmation of shared principles, and a clarification of what constitutes an (in-)appropriate behavior in nuclear politics. Both these cases are also sufficiently "historical" to allow for a comprehensive analysis of the full scope of the regime's adaptation.[3]

We proceed as follows. First, we introduce the concept of antifragility. Second, we present the theoretical framework of this article. In the two sections that follow, we apply our conceptual framework to the India and Iraq cases. We conclude by summarizing our findings and recommending avenues for further research.

Antifragility of complex systems

Taleb (2012) coined the term "antifragility" as a direct opposite of fragility. In his view, antifragility goes beyond mere resilience, an issue that has received an ample amount of attention in IR and related fields (e.g., Aradau, 2014;

Chandler, 2020; Tocci, 2020). Whereas resilient objects can withstand shocks and remain unaffected in the face of disorder, antifragile objects do not just remain the same: They improve. In fact, complex systems *need* stressors and challenges to prevent gradual weakening and to survive in the long run. This has been true for complex organic systems (as opposed to inorganic and mechanical objects) such as muscles, immune system, or species within evolution, yet this logic also applies to socially constructed objects such as norms, institutions, and organizations.

The reason why complex systems require some degree of regular stress and why antifragility is a necessary aspect of their functioning is that it is impossible to *a priori* predict and detect all possible threats coming from the constantly changing external environment. At the same time, the inherent interdependency of individual parts in complex systems necessarily leads to nonlinear responses with outcomes that cannot be fully anticipated beforehand (Taleb, 2012, pp. 21–23). As such, since they cannot be made fully resilient in advance, complex systems need stressors to get cues from their environment, learn, adapt, and improve. In the long haul, this is also the best way to protect them from extreme events that are rare but threaten the existence of these systems (Johnson & Gheorghe, 2013).

In complex systems, antifragility should be treated as a nonexclusive quality or an attribute rather than a general characteristic. In other words, complex objects are usually both fragile and antifragile, albeit to a different extent or to a varying degree on a spectrum (Aven, 2015; Taleb, 2012, p. 37). A system can be antifragile with respect to a certain type of stressor and fragile with respect to another. A system can also be relatively more (or less) antifragile than another system, whether vertically (the same kind of stressor better optimizes its performance) or horizontally (more sources of stress optimize its performance). Finally, individual (predominantly) fragile units can jointly compose a (predominantly) antifragile system, as we can see in business competition in market economies (Taleb, 2012, p. 90).

However, two conditions apply to all antifragile systems. First, the system can only absorb a limited amount of stressors at once. As Taleb (2012) notes, "things are antifragile up to a certain level of stress. Your body benefits from some amount of mishandling, but up to a point—it would not benefit too much from being thrown down from the top of the Tower of Babel" (p. 39). Second, frequency matters. As a general rule, regular exposure to stressors, challenges, and shocks is not just better than none but also better than constant or chronic exposure that does not allow the system to absorb information, recover, and properly adapt (Johnson & Gheorghe, 2013, p. 161; Taleb, 2012, p. 80).

Functional deviance and antifragile institutions

While conceptually sound, Taleb's work provides little specific advice on how to systematically explore antifragility in socially constructed institutions such as international regimes. Nevertheless, we found that the functionalist understanding of the linkage between deviance and norm dynamics in interactionist sociology provides an established theoretical framework that fits well with the logic of antifragility and the systemic adaptation to stress and disorder.

As we discussed earlier, norm violation—or the "deviance" in interactionist sociology—is mostly considered the key threat to the effectiveness and indeed the continued existence of international regimes. This is particularly due to the conceptual understanding of norms as necessary building blocks of these regimes; already in the original international regime theory, norms represented the key to the study of regime dynamics (Krasner, 1982).

If we approach deviance as a societal pathology that leads to norm erosion or collapse, it makes sense why every single norm violation should have a direct (and strictly negative) impact on the regime guided by the given norm. Interactionist sociology, however, departed from this "objectivist" understanding of deviance and theorized it as a power-laden, socially constructed phenomenon that has been a part of the healthy functioning of social orders (Becker, 1963; Dotter & Roebuck, 1988). This functionalist understanding of deviance was first elaborated by Durkheim (1895, pp. 98–101), who proposed that deviance was an integrative element in society and an integral part of the development of morality, norms, and rules. Macionis (2012, p. 197) suggests that deviance has four important societal functions: affirms shared values and norms, clarifies what is right and wrong, binds those who respond to deviance together, and promotes social change. Erikson (1966) similarly proposed that every condemnation of deviant behavior "sharpens the authority of the violated norm and restates where the boundaries of the group are located" (p. 13). As such, transgressions and the process through which society reacts to them do not necessarily lead to erosion or disappearance of violated norms. Rather, these dynamics frequently help to (re)affirm common norms and values, or (re)define the boundaries of appropriate behavior, effectively adapting the social order to new developments (Ben-Yehuda, 1990; Dentler & Erikson, 1959).

In world politics, deviance and the response to it by relevant actors similarly contribute to norm dynamics in international order—as well as individual components of this order, such as international regimes. As theorized by Smetana and Onderco (2018), social construction of deviance in international politics allows for (re)constructing the meaning of norms, challenging and (re)affirming the validity and legitimacy of norms, and repositioning and (re)affirming the relative position and value of a norm

vis-à-vis other norms.[4] As a consequence, "(re)constructions of deviance produce both stability and change in the normative structure of world politics" (Smetana & Onderco, 2018, p. 517; see also Smetana, 2020b, Chapter 3).

If we look at the functionalist understanding of deviance and its IR application through the lenses of antifragility, a deviant event (a "stressor") represents a cue from the environment towards a complex system (here, the NPT regime) that requires a response and possibly a subsequent adaptation. The way that the system responds to the stressor—that is, the way the regime members react to a transgression—is instructive for the impact of the stressor on the system as such. If structured according to the four aforementioned "functions" of deviance, the regime's adaption to a deviant event can follow some of these pathways. First, the joint condemnation and punishment of the deviant act can reaffirm the validity and legitimacy of the norm. Second, since international norms are often vaguely formulated, ambiguous, and generally open to different interpretations (Krook & True, 2012; O'Mahoney, 2014; Wiener, 2009), the deviant act provides an opportunity to clarify the meaning of the norm with respect to a specific real-world situation. Third, deviance can bind the group that jointly denounces the transgression more closely together and sharpen the distinction between the in-group ("us") and the out-group ("them"). Fourth, a deviant act opens a window of opportunity to promote new initiatives, establish new rules, agree on new procedures, and create new institutions to improve the regime's performance, prevent future transgressions, and generally adapt the regime to better withhold future shocks (cf. Martínková & Smetana, 2020; Müller et al., 2013).

Figure 1 illustrates these dynamics. Within the international regime, a deviant event is followed by (1) a joint condemnation and/or punishment of the "deviant", as an act that reaffirms norm's validity and legitimacy

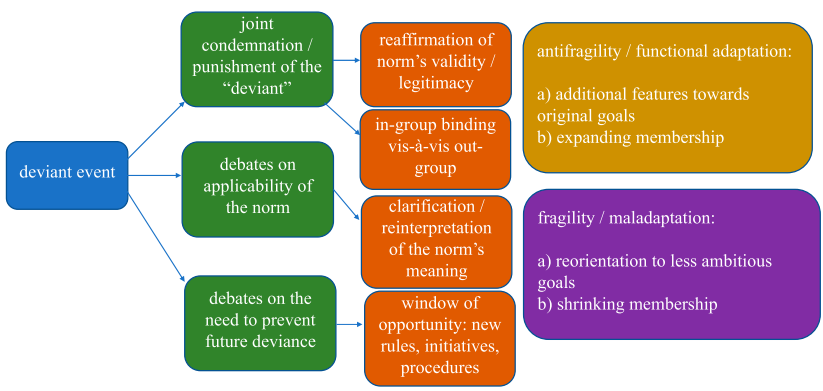


Figure 1. A regime's adaptation to a deviant event.

and binds the in-group vis-à-vis out-group; (2) debates on the real-world applicability of the norm, which clarify and/or (re)interpret the norm's meaning; (3) debates on the need to prevent future deviance, which opens a window of opportunity to establish new rules, initiatives, and procedures. Analytically, we should be able to observe a functional adaptation that corresponds to the logic of antifragility if the process results in the production of new features oriented towards pursuing the original goals of the regime, or in increasing the number of its adherents. Conversely, the stressor produces a negative change, such as decline or weakening, if the regime re-orientates to pursue less ambitious goals or ends up with fewer adherents than before (which we can see as maladaptation that corresponds to the logic of fragility).

To summarize, if a regime responds according to the logic of antifragility, we should be able to see the four dynamics of joint condemnation, in-group binding, meaning clarification, and institutional production of new rules, initiatives, and procedures in response to a deviant event. Moreover, a functional adaptation to a deviant event would require adding new features towards original regime goals or expanding membership, as opposed to maladaptation that would reorient the regime to less ambitious goals or result in a shrinkage of the regime's member base. In the two sections that follow, we show how these dynamics play out in two cases of contestation in the nonproliferation regime: India's 1974 "peaceful nuclear explosion" and the discovery of Iraq's secret nuclear program in the 1990s.

Contestation from outside: India's 1974 "peaceful nuclear explosion"

On May 18, 1974, the Indian government detonated a nuclear explosive device under the ground in the Rajasthan desert. Why was this a deviant event? The general expectation at this time was that the world was moving toward a new order in which new states would not acquire nuclear weapons. In the 1960s, after the Cuban Missile Crisis and China's nuclear testing, the international community had negotiated the NPT. Articles I and II of the treaty prohibited the transfer, manufacturing, or acquisition of nuclear explosive devices. By May 1974, there were 78 states parties to the treaty, and the NPT had established a norm or "an increasingly powerful consensus against proliferation" (Gavin, 2012, p. 102). In other words, after the NPT adoption, "there were clear formal normative transmittals that designated nuclear weapons acquisitions as unacceptable" (Rublee, 2014, p. 93).

While India was not a party to the NPT, its explosion of a nuclear device was widely perceived to be in violation of this normative consensus. There was a concerted effort by the Indian government to argue that India had

broken no laws or treaties and that the test was not a violation of the incipient norm. They used rhetoric from the Atoms for Peace era and Operation Plowshares, as well as the NPT, which relied on a distinction between peaceful and nonpeaceful explosions (Joshi, 2018). On the day of the test, the Atomic Energy Commission of India claimed that it was a "peaceful nuclear explosion experiment," and that New Delhi "had no intention of producing nuclear weapons" (Simons, 1974). These claims were so unsuccessful that India's Ambassador to United Nations published an article in *International Security*, responding to "the current over-reaction to the Indian explosion" and arguing that "India's policy is what might frankly be regarded as normal" (Jaipal, 1977). The pains taken to try to frame the test as peaceful rather than military, and hence within the existing legal and normative framework, show that India believed that there was already an international norm in place governing the use of nuclear technology.

Joint condemnation and punishment

The NPT community did not welcome India's test, nor treat it as normal and unproblematic. At the same time, however, there was no instant, costly enforcement action against India. What we do see increasingly in 1974 and continuing through the rest of the decade was a clear sense that what India had done was against the new normative framework, and action was taken to communicate this both to India and to other states.

Initially, the world was taken by surprise and the rhetoric seemed contradictory at times. The Administrator-General of the French Atomic Energy Commission sent a congratulatory telegram to India's Department of Atomic Energy, although this was later officially withdrawn (Sarkar, 2021, pp. 1–3). Yugoslavia also congratulated India (Epstein, 1976, p. 228). Many countries said nothing publicly or were noncommittal. A small group of countries were outspokenly critical; among them, the United Kingdom, Canada, Japan, Sweden, the Netherlands, Australia, and Pakistan (Epstein, 1976, pp. 226–227). The U.S. response was actively muted as Henry Kissinger directed the State Department to "not issue a strong statement on the Indian nuclear test" (U.S. Department of State, 1974). Some authors have characterized this response as weak and low-key (Burr, 2014, p. 254) or relaxed (Nye, 1981, p. 19). The Indian government, however, was unpleasantly surprised by the harsh and negative responses to the test (Rabinowitz, 2014, p. 178).

Perhaps the most immediate and far-reaching punishment directed at India came from Canada. The plutonium that India diverted into its weapons program was generated from the fuel in a research reactor that Canada had agreed to build in Trombay, India, in 1955. A common rhetoric at the time was that Canada was to blame for not keeping track of the

activities at this reactor, with opposition parties strongly criticizing the government for irresponsibly providing nuclear reactors too readily (Morrison, 1978, p. 62). In response, Canada immediately cut off all nuclear assistance to India, including the suspension of all planned shipments of nuclear equipment and technology worth three million USD. Ottawa also suspended all other nonfood bilateral assistance and did not resume nuclear cooperation until 2010.

The United States also raised the threat of punishing India by adding new terms to their agreement on the delivery of fuel for Tarapur nuclear plant. Against the original deal, Washington started demanding full-scope safeguards for any mutual nuclear cooperation. What had originally been a routine process became a highly politicized issue, with hearings on export licenses involving extensive coverage by both U.S. and Indian media. In 1978, after President Carter personally approved an export license for Tarapur fuel, a bill in the House of Representatives aiming to disallow the shipment to India was only defeated 227 to 181. In 1980, after the passage of the U.S. Nuclear Non-Proliferation Act, there was a fight between the Nuclear Regulatory Commission, which denied a license, President Carter, who allowed it, the House, which vetoed Carter's decision, and the Senate, which approved the shipment 48 to 46 (Walker, 2001).

Opponents argued that India "misused American and Canadian materials to explode a nuclear device" and that "the United States would encourage the spread of nuclear weapons and the prospect of a nuclear war" if the shipment were allowed (Tolchin, 1980). The Carter administration used the desire of "Congress and the general public" to be "punitive" towards India because of the PNE as a bargaining tactic over India's nuclear activities (Department of State, 1977). The fact of conflict over the provision of civilian nuclear fuel served to indicate that nuclear tests, even supposedly peaceful explosions, would be considered a deviant behavior notwithstanding the country's NPT membership status.

Meaning clarification

India's nuclear test led to a changed shared meaning of nonproliferation norms. First, there was a practical specification of what was allowed and what was not. Second, there was an attenuation of the dichotomy between civilian (or "peaceful") and military uses of nuclear technology, with particular reference to "peaceful nuclear explosions" (PNEs). And third, there was securitization of enrichment and reprocessing.

Before 1974, enrichment and reprocessing "remained under the category of peaceful nuclear activities that, subject to safeguards, were the right of every party to the NPT" (Anstey, 2018, p. 14). The NPT provides for an "inalienable right" to "develop research, production and use of nuclear

energy for peaceful purposes" and signatories agree to "the fullest possible exchange of equipment, materials and scientific and technological information" (NPT Article IV, para 1). What the actual meaning of this NPT article was in practice was not widely agreed upon. For example, during the negotiations leading to the drafting of the NPT, the United States and the United Kingdom disagreed about whether gas centrifuge technology, or other processes for the separation of uranium isotopes, were, or should be, inhibited under the treaty (Krige, 2012, p. 222).

However, the applicatory contestation after India's test led to a more concrete understanding of the meaning of these norms. For example, the assessment of the U.S. National Intelligence Council in 1985 was that "during the last 10 years or so […] the consensus has developed among supplier governments that it is legitimate to restrict the transfer of sensitive nuclear technologies and materials abroad," while this consensus has "developed primarily in response to India's 'peaceful' nuclear test in 1974" (National Intelligence Council, 1985). The extent of great power consensus on this issues was such that the USSR was fully supportive of these efforts. Just one example is in a deal to supply India with Heavy Water, the USSR purposefully elided the distinction between weapons and peaceful explosives (Joshi, 2018, p. 1079).

Ingroup vs outgroup

The Indian test led to a creation of a more distinct boundary between NPT members and non-members. This resulted from certain states not only prioritizing NPT membership in bilateral and multilateral diplomacy, but also from a re-evaluation of what NPT membership meant. States like the United States and Canada pushed the narrative that NPT parties constituted an in-group whose members could get access to transfers of nuclear material and technology more easily. By contrast, non-members became an outgroup who were likely going to be frozen out of nuclear cooperation. Previously, states acceding to the NPT were putting themselves under more restrictions than those outside the treaty.

Five days after India's test, the United States approved National Security Study Memorandum 202, in which President Nixon "directed a review of U.S. policy concerning the [NPT]" (U.S. National Security Council, 1974). The goal of this review was to produce a study that would "review present U.S. policy concerning non-proliferation and the NPT […] in particular, in light of India's announcement of its underground nuclear test." The study should "consider specifically whether the U.S. should press for renewed support for the treaty by those now party to it and accession to the treaty by those not yet signators" (U.S. National Security Council, 1974). Washington subsequently changed its nonproliferation policy to prioritize adherence to the NPT and to limit nuclear exports to those

recipient states who were NPT members or who had stricter IAEA safeguards (Miller, 2018).

Following the Indian nuclear test, nonproliferation became almost immediately the dominant criterion in Canada's nuclear export policy, and has remained so, although the government has always maintained that such exports must continue. Debate about nuclear exports, previously couched almost entirely in economic terms, was subsequently charged with strategic considerations (Morrison, 1978, p. 60). Canada announced a new safeguards policy on nuclear exports in December 1974. This was far more stringent than it had been and included lifetime safeguards on all facilities, equipment, and fissile material, as well as a binding assurance would be required of recipients that no Canadian nuclear material, equipment, or technology would be used to produce an explosive device for whatever purpose. Then in December 1976, Canada announced that only those non-nuclear weapon states who were NPT parties or who had full-scope safeguards on their entire nuclear program would receive any Canadian nuclear exports (Hunt, 1977). This included insisting "that no nuclear deals will be made with any nation which has not ratified the non-proliferation treaty" (Central Intelligence Agency, 1975). For example, Argentina had to renegotiate the terms of the agreement regarding the export of a nuclear power plant and technological knowhow, which both countries had agreed to in 1973 (Patti & Mallea, 2018, p. 1004). This drew a clear line between a favored in-group and a deviant outgroup.

In the two years following India's nuclear test, several countries that had been notable holdouts on NPT were pressured into ratification by the United States and Canada. For the United States, this involved making the Italians and Japanese believe that their continued access to nuclear fuel, enriched uranium, and other nuclear materials and technology as well as financing for nuclear projects, was dependent upon NPT ratification. The Canadian government was much more directly coercive, making the supply of uranium (to Italy) and nuclear reactors (to Korea) explicitly conditional upon ratification (O'Mahoney, 2020). Italy and South Korea ratified in 1975, with Japan following in 1976.

A particularly good example of how the distinction between in-group and out-group became relevant is U.S. policy towards South Africa. In 1973, the United States signed a contract to supply fuel (enriched uranium) to two of South Africa's reactors. However, as part of the nuclear export policy review resulting from India's test, President Gerald Ford decided in 1976 to threaten to withhold export licenses for enriched uranium from South Africa unless it signed the NPT and put all of its nuclear facilities and equipment under IAEA safeguards. Then, in 1977, when Carter came into office, he immediately put this policy into practice and suspended the export licenses (Van Wyk, 2007).

New initiatives, rules, and procedures

Perhaps the most easily visible result of the deviant event was the created of new rules, initiatives, and institutions. There were new rules about what nuclear materials and technology could be exported from supplier states, manifested in the creation of the Nuclear Suppliers Group (NSG), which served to co-ordinate the nuclear export policies of major states. There was also an updated so-called "trigger list" by the Zangger committee, as well as the U.S. Nuclear Non-Proliferation Act. Moreover, there was a new effort to prevent the spread and acquisition of nuclear technology, especially elements of the fuel cycle, resulting in the canceling of numerous pledges of nuclear assistance and nuclear export deals.

As part of the development of the NPT, in 1970, a group of exporter members got together on the so-called Zangger Committee to seek agreement on export control policies, including an agreed interpretation of the NPT Article III.2 obligation not to export fissile material and equipment that could process it or use it unless safeguards were applied. The Zangger Committee developed a "minimum trigger list" which would require safeguards (Burr, 2014, p. 255). However, after the Indian test, the U.S. government sought to create a nuclear supplier's conference, initially called the London Club, to make proliferation more difficult by promulgating standards to help prevent the diversion of nuclear exports into military programs. This developed into the NSG. During the discussions over the NSG, the United States has tried to recategorize enrichment and reprocessing from peaceful assistance to the prohibited "assistance in the manufacture of nuclear weapons" in Articles I and II (Anstey, 2018).

In the United States, there was a raft of new legislation resulting from the reaction to India's test in Congress and elsewhere. The Symington Amendment in 1976, prohibited all U.S. economic and military aid to any country exporting or importing reprocessing and enrichment facilities and related materials and technology without full-scope safeguards. The Glenn Amendment in 1977 required the cut-off of U.S. economic and military aid to any country that imported or exported reprocessing equipment, materials, or technology whether or not the country complied with IAEA safeguards. Then, in 1978, the Nuclear Non-Proliferation Act required recipient states to accept full-scope IAEA safeguards in order to receive U.S. nuclear assistance, and it required U.S. consent for retransferring and storage of any U.S.-origin materials, even when provided by another supplier (Rabinowitz & Sarkar, 2018).

In addition to new rules and institutions, numerous agreements and deals over nuclear exports were challenged, postponed, and canceled. This was often due to US diplomatic pressure, but also "the emergence of opposing domestic factions on the nuclear front in the supplier states" (Rabinowitz

& Sarkar, 2018, p. 277). France had deals with South Korea and Pakistan that were canceled and France declared a halt to the export of reprocessing facilities in 1976 (Tzeng, 2013). West Germany followed suit in 1977. The United States changed the terms of deals with South Korea, Iran, Egypt, Israel, South Africa, and Taiwan (Miller, 2014; Rabinowitz & Miller, 2015; Rabinowitz & Sarkar, 2018; Romberg, 2018). Canada renegotiated safeguards with South Korea and Argentina, canceled nuclear assistance to Pakistan, and renegotiated export of uranium contracts with a variety of countries including the EU states, Japan, and even the United States. When negotiations did not go as far as Canada wanted, uranium shipments were suspended (Morrison, 1978).

In summary, the deviant event of India's test in 1974, while putting the nonproliferation regime and the NPT under stress, actually led to the reaffirmation of the validity and legitimacy of the norm and improved the regime's performance. We can see the antifragility of the NPT in the way in which the stress of India's test made the regime better able to deal with future transgressions. Since India's PNE led to increased restrictions on the transfer of enrichment and reprocessing technologies, any future weaponization event was less of a threat to the regime as the general latency was significantly lower than it might have been. Imagine if there had been no Indian explosion in 1974 and the transfer of enrichment and reprocessing technology had continued unabated. If in the 1980s, say, another country had exploded a device, then the number of states able to indigenously detonate a device in response would have been larger.

Contestation from within: Iraq's secret nuclear program in the 1990s

After the defeat of Iraq in the Gulf War, the United Nations Security Council (UNSC) asked Baghdad to submit a report on its nuclear program to the Secretary General and the IAEA. In UNSC Resolution 687, the IAEA was directed "to carry out immediate on-site inspection of Iraq's nuclear capabilities" and make "an inventory of all nuclear materials in Iraq." Over the next year, the world discovered that Iraq, a member of the NPT, had had a clandestine nuclear weapons program, which included multiple methods of uranium enrichment. The inspectors found a "multi-billion dollar, Manhattan Project-style atomic bomb program […] aimed at establishing the knowledge and infrastructure to build several nuclear bombs a year" (Albright & Hibbs, 1992, p. 3).

Importantly, these revelations did not come as a result of the normal functioning of IAEA inspections. In the chaotic post-war situation, inspectors specially tasked by the UNSC took unusual steps to seek out evidence. In June 1991, Chief Inspector David Kay and his team, while pursuing trucks

seemingly running away from the site, identified them as carrying spectrometers for uranium enrichment when they were shot at by Iraqi staff. This led to Iraq admitting to the UNSC on July 7 that it had secretly engaged in enrichment activities. In September, Kay's IAEA team found documents that "proved conclusively" that Iraq was pursuing a weapons program (Blix, 2004, p. 25). Iraq's weapons program was a clear violation of both the black letter law of the NPT regime and the more general expectations around what was possible in terms of clandestine nuclear activity.

Joint condemnation and punishment

There was considerable explicit public condemnation of Iraq. After the initial set of revelations from the special inspections, the IAEA Board of Governors voted on July 18, 1991 to condemn Iraq for violating the NPT and Iraq's safeguards agreement (Albright & Hibbs, 1991, p. 15). In August, the UNSC unanimously adopted Resolution 707, in which it "condemns non-compliance by the Government of Iraq with its obligations under its safeguards agreement […] which constitutes a violation of its commitments as a party to [NPT]" (UNSC, 1991).

These formal condemnations were accompanied by the imposition of an unprecedentedly intrusive monitoring and sanctions regime on Iraq. Subsequently, a U.S.-led coalition threatened Iraq with military force (e.g., Operation Desert Thunder) and even used military force (e.g., Operation Desert Fox) in pursuit of enforcing the new inspections that were applied as a result of the deviant event.

Meaning clarification

The Iraqi violation led to a rethinking of what it meant to be under safeguards. Before, there had been an assumption that monitoring was only feasible for *voluntarily declared* safeguarded materials. Afterwards, this was seen as inadequate, and that safeguards should apply even to *undeclared* nuclear activities.

There was a difference between the IAEA's powers on paper and in reality. The IAEA defined how safeguards would work under the NPT in INFCIRC/153, with arguably sweeping powers given to the Board to determine what access inspectors should be given to verify non-diversion of fissionable materials (Sloss, 1995, pp. 858–589). However, in practice, inspections would only concern declared nuclear material, under the assumption that states would declare all of their material to the IAEA. Two things changed (Scheinman, 1993). First, Iraq's violation suggested that existing safeguards could not stop a state operating clandestinely without any safeguarded material. For example, excluding facilities from safeguards meant that a

state could acquire or construct facilities and not be required to inform the IAEA about them. Second, safeguards coverage went from verifying only declared nuclear material to expecting that the IAEA should verify the absence of any, even undeclared, material or facilities. This was a major expansion of the idea of the "completeness" standard. Previously, completeness had only applied to fissionable materials that were part of the official quantity.

Ingroup vs outgroup

There are two ways to think about the effect of the discovery of Iraq's clandestine program on the ingroup-outgroup dynamics of the nonproliferation regime. On the one hand, Keeley (1994, p. 127) argues that the Iraqi case broke down the distinction between NPT members and "a set of 'outside', 'deviant', or at least marginal states" because Iraq was both a member *and* a deviant. This was exacerbated by the strong suspicion that North Korea also had a clandestine program before announcing its intention to withdraw from the NPT in 1993.

On the other hand, there was also a new dividing line, which was between those states in compliance with their NPT obligations and those not. Because of the discovery of Iraq's noncompliance, adherence to safeguards agreements (including the enhanced Additional Protocol, which we discuss below) became a new and important marker of who counted as a "rogue" state. Anthony Lake, Clinton's National Security Adviser, declared that a group of "recalcitrant and outlaw […] 'backlash' states" were "outside the family" partly because they clandestinely pursued weapons of mass destruction (Lake, 1994).

New initiatives, rules, and institutions

Before Iraq, the IAEA determined the size of its safeguards effort by the size and complexity of the nuclear industry of the country concerned (Fischer, 1992, p. 82). It focused on diversions from facilities where safeguards are applied and specifically on diversion of safeguarded nuclear material (Keeley, 1994, p. 134). Institutional changes in response to Iraq's violations included a significant overhaul of the types of safeguards applied by the IAEA, such as more and better information being given to the IAEA, and better access to sites, including so-called "no notice" inspections (Smetana, 2020b, pp. 122–123).

The IAEA Department of Safeguards initiated "Program 93 + 2" in response to the Iraq revelations, which led to the adoption of several measures designed to strengthen the implementation of safeguards, especially aimed at undeclared activities. In 1997, the agency adopted a

Model Additional Protocol, INFCIRC/540c, that laid out the types of changes that parties were expected to make to their safeguards agreements. These included the provision of information about states' entire nuclear fuel cycle, including facilities like uranium mines that had not previously been safeguarded, as well as research and development activity that does not involve nuclear material. States now also had to provide information on all buildings on a particular site and the manufacture and export of sensitive nuclear-related equipment. IAEA inspectors should have access to all of these locations on a potentially very short notice, facilitated by the issuing of multiple entry/exit visas. In addition, environmental sampling and analysis can be conducted anywhere, not just in declared locations. These measures included using cotton swipes inside and around process buildings, to detect nuclear signatures which might reveal undeclared activities (Donohue, 1998). As of 31 December 2020, Additional Protocols are in force with 136 states and Euratom and another 14 states have signed an Additional Protocol but have yet to bring it into force.

In response to the discovery of Iraq's clandestine nuclear pursuit, the NSG also expanded the existing trigger list to include various types of dual-use items (Wan, 2014, p. 223). Moreover, the NSG agreed that any future supplies to non-nuclear weapon states will be conditional upon the acceptance of the IAEA full-scope safeguards (NSG, 1993).

In summary, Iraq's deviant behavior with respect to nonproliferation norms certainly came as a shock to the NPT community but it hardly "damaged" it in a way that would impede the regime's ability to pursue its original goals. Instead, the regime membership has significantly expanded during the 1990s and in 1995, the NPT members agreed on an indefinite extension of the treaty. New standards in the area of safeguards and monitoring that were set in the wake of Iraqi's noncompliance arguably made the regime more capable of discovering breaches of the nonproliferation norm among its member states. The Additional Protocol, while not yet adopted universally, has also proved to be an important instrument for verification and confidence building in another prominent case of ingroup deviance: the discovery of Iran's clandestine nuclear program in the 2000s (Smetana, 2020b, pp. 141–161).

Conclusions and avenues for further research

In this article, we introduced "antifragility" as a conceptual framework to understand the impact of occasional violations of regime norms on the health of respective international regimes. Contrary to the prevailing understanding of norm violation as a strictly negative phenomenon that leaves the violated norm (and therefore also the regime) damaged in consequence, we showed that normative deviance is, under certain conditions, a stressor that

helps predominantly antifragile systems such as international regimes learn, improve, and generally adapt to changes in their environment. We applied this conceptual framework to the case of NPT and the prominent violations of its nonproliferation norms by India in the 1970s and Iraq in the 1990s. In both cases, the transgressions resulted in the reaffirmation of shared norms, clarification of the meanings of such norms in practice, reestablishment of ingroup-outgroup boundaries, and promotion of new initiatives, rules, and procedures. Rather than being damaged beyond repair, our findings suggest that the NPT regime actually *improved*, growing in membership and being able to pursue its original goals more effectively than before.[5]

This is not to say that there are no relevant differences between the two cases. One such is that India's deviation from the spirit of the norm was not a violation of the *formal* rules, whereas Iraq's violations were. In a sense, Iraq was exploiting a loophole in the rules and the regime was able to close that loophole. This was not the case with India, which not only broke no international treaties but also had a somewhat plausible claim to "peaceful nuclear activities" similar to those of other states. One possible way of accommodating this difference into the antifragile model could be to differentiate between stages of norm development. Stressors of an incipient and relatively inchoate norm, as the nonproliferation norm still was in 1974, likely produce more fundamental changes, such as in the basic conceptual categories making up the norms. By contrast, in 1991, Iraq's violations were stressors of a more mature and institutionalized regime, and therefore mainly produced a tightening of enforcement procedures. Another useful analytical distinction would be Wiener's (2014, pp. 75–76) vertical typology of fundamental norms, organizing principles, and standardized procedures, which allow for a different level of analysis on different levels of norms' formalization. More research is needed into these processes.

Another difference between the two cases is the domain of meanings clarification or the locus of contestation. The case of India challenged understandings of the nature of the technology and the extent of permissible trade, whereas Iraq forced a reevaluation of the efficacy of the inspections' regime. One implication of this is that the antifragile model and its application on the NPT is potentially domain-independent—in other words, the model is able to account for different types of nonproliferation deviance.

Admittedly, some features of these two cases somewhat limit the broader applicability of our findings. Perhaps most importantly, they both involve violations by states that have not been core, pro-system members of the regime. India was not an NPT member and it was known for its hostile rhetoric towards the NPT's two-tier system of rights over nuclear technology. Iraq had just been the target of unprecedented backlash from the international community for its invasion of Kuwait. Contestation by these actors would less likely lead to rupture than might similar norm violations by the

core states—like any of the five official nuclear weapon states. Thus, it is plausible that the findings would primarily extend to violations by low-status or outsider states who skirted the edges of the rules, but perhaps not to violations by core members who would suddenly reject the entire purpose of the institution. Indeed, the power of relevant actors seems to be a critically important factor in all stages of the process of the regime's reaction to a norm violation (cf. Hanson, 2022). This argument is in line with literature that highlights the role of power and social stratification in the social construction of deviance in world order (Adler-Nissen, 2014; Smetana, 2020a; Wagner et al., 2014).

We hope that our article will contribute to the debate about the past and future of the NPT and offer some balance against the prevailing catastrophizing accounts of the regime's imminent collapse, which have been a regular part of nuclear weapons scholarship for decades. In this special issue, Gibbons and Herzog (2022) suggest that the emerging multipolarity in world order makes further regime adaptations very difficult if not impossible. Similarly, Knopf (2022) argues that the nonproliferation regime was able to adapt to new challenges in the past but it has lost the ability to do so in the past couple of years. Yet, the regime has not remained static in the face of the recent norm violations. Major contestations of the past years, including the discovery of Iran's clandestine facilities, North Korea's nuclear breakout, or the U.S.–India nuclear cooperation agreement, did not cause the regime to disintegrate or result in an unstoppable proliferation cascade. Rather, there is evidence of a gradual normative adaptation to these events, that is possibly long, arduous, and non-linear, yet still within the scope of the regime's ability to respond to new challenges (cf. Smetana, 2020b, chapters 5–7; Wunderlich, 2020). The fact that such deviant events provoke strong reactions of policymakers and diplomats is an expected and, indeed, a necessary aspect of the regime's healthy functioning. From an analytical standpoint, however, we see little evidence that these developments will dramatically influence the regime's core functions or even threaten its future existence.

That being said, we caution against misinterpreting our argument as promoting nonproliferation norm violations or even suggesting that all such violations necessarily improve the regime. As we discussed in the theoretical part, antifragility requires stressors but only in a certain amount and frequency. Chronic and frequent norm violations would certainly threaten the regime's effective functioning and lead to maladaptive outcomes with respect to the original goals of the regime. Similarly, regime members need to be both able and willing to condemn and punish deviant behavior, as violations that do not meet with disapproval can trigger non-compliance cascades, possibly leading to norm degeneration or disappearance (Panke & Petersohn, 2012). Future scholarship should explore other cases of norm violations and identify the conditions under which international regimes do not

properly adapt to norm violations or adapt in a suboptimal way. We believe that the concept of antifragility represents an interesting avenue for research of international regimes and institutions that may be worth pursuing by other scholars in our field.

Notes

1. For rare but persuasive accounts that contest this catastrophizing narrative see Horovitz (2015) or Barnum and Lo (2020).
2. In contradiction to the historical record, such images of a collapsing regime are often tied to the idea of an unstoppable "proliferation cascade" that would ensue in the aftermath of a serious norm violation (e.g., Doyle, 2017, p. 15). For a discussion of a biased reading of the (non-)proliferation history, see Pelopidas (2011).
3. Arguably, this would not be the case in more recent Iran's and North Korea's transgressions where the NPT regime is still in the process of adaptation. We, nevertheless, briefly comment on these more recent developments in the concluding section of this article.
4. For IR literature on norm contestation, see Wiener (2004), Sandholtz (2008), Müller and Wunderlich (2013), O'Mahoney (2014, 2018), and Deitelhoff and Zimmermann (2020).
5. We certainly do not want to claim that *without* these particular episodes, the NPT regime would subsequently be seriously struggling or even collapse. Indeed, as Horovitz (2015) persuasively claims, the regime is built on solid foundations and strong mutual interests of its members that make the scenario of a regime's demise highly unlikely in the foreseeable future. Our findings rather suggest that these specific cases of deviance led to the improvement of the regime's performance, making it *better* adapted to future shocks, notwithstanding their outcome. We are thankful to one of the reviewers of this paper for the comments that led to this clarification.

Acknowledgements

We are grateful to Maria Rost Rublee, Carmen Wunderlich, Hylke Dijkstra, and two anonymous reviewers for their valuable comments on earlier versions of this article.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

We thankfully acknowledge funding by the Charles University Center of Excellence program UNCE/HUM/28 (Faculty of Social Sciences/Peace Research Center Prague) and PROGRES Q18.

Notes on contributors

Michal Smetana is a Researcher and Lecturer at the Faculty of Social Sciences, Charles University, and Coordinator of the Peace Research Center Prague. He was previously a Fulbright Scholar at Stanford University, and a Visiting Research Fellow at the Stockholm International Peace Research Institute and Peace Research Institute Frankfurt. His main research interests lie at the intersection of security studies, international relations, and political psychology, with a focus on issues related to nuclear weapons in world politics, arms control and disarmament, and norms and deviance in international affairs. His articles have been published in *International Affairs, Journal of Peace Research, International Studies Review, Journal of International Relations and Development, International Relations, Politics, International Interactions, Cambridge Review of International Affairs,* and many other scholarly journals. He is the author of *Nuclear Deviance: Stigma Politics and the Rules of the Nonproliferation Game* (Palgrave Macmillan, 2020).

Joseph O'Mahoney is a Lecturer in Politics and International Relations at the University of Reading. He was previously a Stanton Nuclear Faculty Fellow at MIT and has taught at Brown University, Seton Hall University, and George Washington University. O'Mahoney works on topics surrounding the issue of norms and violations in the areas of nuclear politics, international security, and human rights. He is the author of *Denying the Spoils of War: The Politics of Invasion and Nonrecognition* (Edinburgh University Press, 2018) and articles in journals such as *International Organization*, *European Journal of International Relations*, *The Nonproliferation Review*, *International Theory*, and the *Journal of Global Security Studies*.

ORCID

Michal Smetana http://orcid.org/0000-0002-1901-9428
Joseph O'Mahoney http://orcid.org/0000-0002-6316-1771

Reference list

Adler-Nissen, R. (2014). Stigma management in international relations: Transgressive identities, norms, and order in international society. *International Organization*, *68*(01), 143–176. https://doi.org/10.1017/S0020818313000337

Albright, D., & Hibbs, M. (1991). Iraq's nuclear hide-and-seek. *Bulletin of the Atomic Scientists*, *47*(7), 14–23. https://doi.org/10.1080/00963402.1991.11460006

Albright, D., & Hibbs, M. (1992). Iraq's quest for the nuclear grail: What can we learn? *Arms Control Today*, *22*(July/August).

Allison, G. T. (2010). Nuclear disorder: Surveying atomic threats. *Foreign Affairs*, *89* (1), 74–85. https://doi.org/10.2307/20699784

Anstey, I. (2018). Negotiating nuclear control: The Zangger committee and the nuclear suppliers' group in the 1970s. *International History Review*, *40*(5), 975–995. https://doi.org/10.1080/07075332.2018.1449764

Aradau, C. (2014). The promise of security: Resilience, surprise and epistemic politics. *Resilience*, *2*(2), 73–87. https://doi.org/10.1080/21693293.2014.914765

Asculai, E. (2004). The nuclear nonproliferation regime: A rethink? In E. B. Landau & A. Bermant (Eds.), *The nuclear nonproliferation regime at a crossroads* (pp. 75–84). Jaffee Center for Strategic Studies, Tel Aviv University.

Aven, T. (2015). The concept of antifragility and its implications for the practice of risk analysis. *Risk Analysis*, *35*(3), 476–483. https://doi.org/10.1111/risa.12279

Barnum, M., & Lo, J. (2020). Is the NPT unraveling? Evidence from text analysis of review conference statements. *Journal of Peace Research*, *57*(6), 740–751. https://doi.org/10.1177/0022343320960523

Becker, H. S. (1963). *Outsiders: Studies in the sociology of deviance*. Free Press Glencoe.

Ben-Yehuda, N. (1990). *The politics and morality of deviance: Moral panics, drug abuse, deviant science, and reversed stigmatization*. State University of New York Press.

Biswas, S. (2014). *Nuclear desire: Power and the postcolonial nuclear order*. University of Minnesota Press.

Blix, H. (2004). *Disarming Iraq: The search for weapons of mass destruction*. Bloosmbury.

Burr, W. (2014). A scheme of 'control': The United States and the origins of the nuclear suppliers' group, 1974–1976*. *International History Review*, *36*(2), 252–276. https://doi.org/10.1080/07075332.2013.864690

Carranza, M. E. (2007). Can the NPT survive? The theory and practice of US nuclear non-proliferation policy after September 11. *Contemporary Security Policy*, *27*(3), 489–525. https://doi.org/10.1080/13523260601060537

Central Intelligence Agency. (1975, March 18). *CIA staff notes: Western Europe, Canada, International Organizations, CREST CIA-RDP79T00865A000600040001-2*.

Chandler, D. (2020). Security through societal resilience: Contemporary challenges in the anthropocene. *Contemporary Security Policy*, *41*(2), 195–214. https://doi.org/10.1080/13523260.2019.1659574

Deitelhoff, N., & Zimmermann, L. (2020). Things we lost in the fire: How different types of contestation affect the robustness of international norms. *International Studies Review*, *22*(1), 51–76. https://doi.org/10.1093/isr/viy080

Dentler, R. A., & Erikson, K. T. (1959). The functions of deviance in groups. *Social Problems*, *7*(2), 98–107. https://doi.org/10.2307/799160

Donohue, D. (1998). Strengthening IAEA safeguards through environmental sampling and analysis. *Journal of Alloys and Compounds*, *271–273*, 11–18. https://doi.org/10.1016/S0925-8388(98)00015-2

Dotter, D. L., & Roebuck, J. B. (1988). The labeling approach re-examined: Interactionism and the components of deviance. *Deviant Behavior*, *9*(1), 19–32. https://doi.org/10.1080/01639625.1988.9967765

Doyle, T. (2017). A moral argument for the mass defection of non-nuclear-weapon states from the nuclear nonproliferation treaty regime. *Global Governance: A Review of Multilateralism and International Organizations*, *23*(1), 15–26. https://doi.org/10.1163/19426720-02301002

Durkheim, E. (1895). *The rules of sociological method*. The Free Press.

Epstein, W. (1976). *The last chance: Nuclear proliferation and arms control*. The Free Press.

Erikson, K. (1966). *Wayward Puritans: A study in the sociology of deviance*. John Wiley & Sons.

Fischer, D. (1992). Innovations in IAEA safeguards to meet the challenges of the 1990s. In D. Fischer et al. (Eds.), *A new nuclear triad: The non-proliferation of nuclear weapons, International Verification and the International Atomic energy agency* (pp. 31–38). Mountbatten Centre for International Studies.

Fuhrmann, M. (2009). Spreading temptation: Proliferation and peaceful nuclear cooperation agreements. *International Security*, *34*(1), 7–41. https://doi.org/10.1162/isec.2009.34.1.7

Fuhrmann, M., & Tkach, B. (2015). Almost nuclear: Introducing the nuclear latency dataset. *Conflict Management and Peace Science*, *32*(4), 443–461. https://doi.org/10.1177/0738894214559672

Gavin, F. J. (2012). *Nuclear statecraft: History and strategy in America's atomic age*. Cornell University Press.

Gibbons, R. D., & Herzog, S. (2022). Can the NPT and the nuclear nonproliferation regime survive emerging multipolarity? *Contemporary Security Policy*, Forthcoming.

Goldschmidt, P. (2009). Exposing nuclear non-compliance. *Survival*, *51*(1), 143–164. https://doi.org/10.1080/00396330902749764

Hanson, M. (2022). The NPT: The limits of a treaty based on a 'power over' model. *Contemporary Security Policy*, Forthcoming.

Harrington, A. (2009). Nuclear weapons as the currency of power. *The Nonproliferation Review*, *16*(3), 325–345. https://doi.org/10.1080/10736700903255029

Horovitz, L. (2015). Beyond Pessimism: Why the treaty on the non-proliferation of nuclear weapons will not collapse. *Journal of Strategic Studies*, *38*(1–2), 126–158. https://doi.org/10.1080/01402390.2014.917971

Hunt, C. D. (1977). Canadian policy and the export of nuclear energy. *The University of Toronto Law Journal*, *27*(1), 69–104. https://doi.org/10.2307/825559

Huntley, W. L. (2006). Rebels without a cause: North Korea, Iran and the NPT. *International Affairs*, *82*(4), 723–742. https://doi.org/10.1111/j.1468-2346.2006.00565.x

Jaipal, R. (1977). The Indian nuclear explosion. *International Security*, *1*(4), 44–51. https://doi.org/10.2307/2538621

Johnson, J., & Gheorghe, A. V. (2013). Antifragility analysis and measurement framework for systems of systems. *International Journal of Disaster Risk Science*, *4*(4), 159–168. https://doi.org/10.1007/s13753-013-0017-7

Joshi, Y. (2018). Between principles and pragmatism: India and the nuclear non-proliferation regime in the post-PNE era. *The International History Review*, *40*(5), 1073–1093. https://doi.org/10.1080/07075332.2017.1417322

Keeley, J. F. (1994). Weapons of mass destruction as mature technologies. In D. Mutimer (Ed.), *Control but verify: Verification and the new non-proliferation agenda* (pp. 171–179). York University.

Kittrie, O. F. (2007). Averting catastrophe: Why the nuclear nonproliferation treaty is losing its deterrence capacity and how to restore it. *University of Michigan Journal of International Law*, *28*, 337–430.

Knopf, J. W. (2022). Not by NPT alone: The future of the global nuclear order. *Contemporary Security Policy*, Forthcoming.

Krasner, S. D. (1982). Structural causes and regime consequences: Regimes as intervening variables. *International Organization*, *36*(2), 185–205. https://doi.org/10.1017/S0020818300018920

Krige, J. (2012). The proliferation risks of gas centrifuge enrichment at the dawn of the NPT. *The Nonproliferation Review*, *19*(2), 219–227. https://doi.org/10.1080/10736700.2012.690961

Krook, M. L., & True, J. (2012). Rethinking the life cycles of international norms: The United Nations and the global promotion of gender equality. *European Journal of*

International Relations, *18*(1), 103–127. https://doi.org/10.1177/1354066110380963
Lake, A. (1994). Confronting Backlash states. *Foreign Affairs*, *73*(2), 45–55. https://doi.org/10.2307/20045918
Macionis, J. J. (2012). *Sociology* (14th ed.). Pearson.
Martínková, H., & Smetana, M. (2020). Dynamics of norm contestation in the chemical weapons convention: The case of 'non-lethal agents'. *Politics*, *40*(4), 428–443. https://doi.org/10.1177/0263395720904605
Meyer, P. (2009). Saving the NPT. *The Nonproliferation Review*, *16*(3), 463–472. https://doi.org/10.1080/10736700903255128
Miller, N. L. (2014). Nuclear dominoes: A self-defeating prophecy? *Security Studies*, *23*(1), 33–73. https://doi.org/10.1080/09636412.2014.874189
Miller, N. L. (2018). *Stopping the bomb: The sources and effectiveness of US nonproliferation policy*. Cornell University Press.
Miller, S. E. (2012). *Nuclear collisions: Discord, reform & the nuclear nonproliferation regime*. American Academy of Arts and Sciences.
Morrison, R. W. (1978). *Canada's nuclear export policy*. Carleton University.
Müller, H. (2017). The nuclear non-proliferation treaty in jeopardy? Internal divisions and the impact of world politics. *The International Spectator*, *52*(1), 12–27. https://doi.org/10.1080/03932729.2017.1270088
Müller, H., Fey, M., & Rauch, C. (2013). Winds of change: Exogenous events and trends as norm triggers (or norm killers). In H. Müller & C. Wunderlich (Eds.), *Norm dynamics in multilateral arms control: Interests, conflicts, and justice* (pp. 141–162). University of Georgia Press.
Müller, H., & Wunderlich, C. (Eds.). (2013). *Norm dynamics in multilateral arms control: Interests, conflicts, and justice*. University of Georgia Press.
National Intelligence Council. (1985). *The dynamics of nuclear proliferation: Balance of incentives and constraints. NIC M 85-10001. U.S. Intelligence assessments of potential nuclear powers, 1977–2001*. George Washington University.
Noda, O. (2022). A wolf in sheep's clothing? The NPT and symbolic proliferation. *Contemporary Security Policy*, Forthcoming.
NSG. (1993). *Press statement on the 1993 meeting of the "Nuclear Suppliers Group" (NSG) in Lucerne (Switzerland) from 30 March to 1 April 1993*. http://www.bits.de/ac-archive/6pr/on/nsg/1993-Press.pdf.
Nye, J. S. (1981). Maintaining a nonproliferation regime. *International Organization*, *35*(1), 15–38. https://doi.org/10.1017/S0020818300004069
O'Mahoney, J. (2014). Rule tensions and the dynamics of institutional change: From'to the victor go the spoils' to the Stimson doctrine. *European Journal of International Relations*, *20*(3), 834–857. https://doi.org/10.1177/1354066113483781
O'Mahoney, J. (2018). *Denying the Spoils of War*. Edinburgh University Press.
O'Mahoney, J. (2020). The smiling Buddha effect: Canadian and US policy after India's 1974 nuclear test. *Nonproliferation Review*, *27*(1), 1–19. https://doi.org/10.1080/10736700.2020.1803561
Panke, D., & Petersohn, U. (2012). Why international norms disappear sometimes. *European Journal of International Relations*, *18*(4), 719–742. https://doi.org/10.1177/1354066111407690
Patti, C., & Mallea, R. (2018). American seeds of ABACC? Findley's proposal to create a mutual nuclear inspections system between Brazil and Argentina.

International History Review, *40*(5), 996–1013. https://doi.org/10.1080/07075332.2018.1441891
Pelopidas, B. (2011). The oracles of proliferation: How experts maintain a biased historical reading that limits policy innovation. *The Nonproliferation Review*, *18*(1), 297–314. https://doi.org/10.1080/10736700.2011.549185
Pilat, J. F. (2007). The end of the NPT regime? *International Affairs*, *83*(3), 469–482. https://doi.org/10.1111/j.1468-2346.2007.00632.x
Pretorius, J., & Sauer, T. (2022). When is it legitimate to abandon the NPT? Withdrawal as a political tool to move nuclear disarmament forward. *Contemporary Security Policy*, Forthcoming.
Rabinowitz, O. (2014). *Bargaining on nuclear tests: Washington and its Cold War deals*. Oxford University Press.
Rabinowitz, O., & Miller, N. L. (2015). Keeping the bombs in the basement: US nonproliferation policy toward Israel, South Africa, and Pakistan. *International Security*, *40*(1), 47–86. https://doi.org/10.1162/ISEC_a_00207
Rabinowitz, O., & Sarkar, J. (2018). 'It isn't over until the fuel cell sings': A reassessment of the US and French pledges of nuclear assistance in the 1970s. *Journal of Strategic Studies*, *41*(1–2), 275–300. https://doi.org/10.1080/01402390.2017.1328355
Ritchie, N. (2019). A hegemonic nuclear order: Understanding the Ban Treaty and the power politics of nuclear weapons. *Contemporary Security Policy*, *40*(4), 409–434. https://doi.org/10.1080/13523260.2019.1571852
Romberg, D. (2018). How to further develop the nonproliferation regime? West German nuclear exports to Brazil and Iran in context of US criticism. *International History Review*, *40*(5), 1094–1114. https://doi.org/10.1080/07075332.2018.1444665
Rublee, M. R. (2014). Construction of threat and nuclear nonproliferation measures: Considerations on theory and policy. In J. R. Fields (Ed.), *State behavior and the nuclear nonproliferation regime* (pp. 84–105). University of Georgia Press.
Sandholtz, W. (2008). Dynamics of international norm change: Rules against wartime plunder. *European Journal of International Relations*, *14*(1), 101–131. https://doi.org/10.1177/1354066107087766
Sarkar, J. (2021). From the dependable to the demanding partner: The renegotiation of French nuclear cooperation with India, 1974–80. *Cold War History*, *21*(3), 301–318. https://doi.org/10.1080/14682745.2019.1694908
Sauer, T. (2006). The nuclear nonproliferation regime in crisis. *Peace Review*, *18*(3), 333–340. https://doi.org/10.1080/10402650600848274
Scheinman, L. (1993). Lessons from post-war Iraq for the international full-scope safeguards regime. *Arms Control Today*, *23*, 3–3.
Simons, L. M. (1974, May 19). India explodes a-device, cites 'peaceful use'. *Washington Post*.
Sloss, D. (1995). It's not broken, so don't fix it: The international atomic energy agency safeguards system and the nuclear nonproliferation treaty. *Virginia Journal of International Law*, *35*, 841–894.
Smetana, M. (2020a). (De-)stigmatising the outsider: Nuclear-armed India, United States, and the global nonproliferation order. *Journal of International Relations and Development*, *23*(3), 535–558. https://doi.org/10.1057/s41268-018-0165-x
Smetana, M. (2020b). *Nuclear deviance: Stigma politics and the rules of the nonproliferation game*. Palgrave Macmillan.

Smetana, M., & Onderco, M. (2018). Bringing the outsiders in: An interactionist perspective on deviance and normative change in international politics. *Cambridge Review of International Affairs*, *31*(6), 516–536. https://doi.org/10.1080/09557571.2018.1549021

Taleb, N. N. (2012). *Antifragile: Things that gain from disorder*. Random House.

Tannenwald, N. (2007). *The nuclear taboo: The United States and the non-use of nuclear weapons since 1945*. Cambridge University Press.

Thakur, R. (2011). Nuclear nonproliferation and disarmament: Can the power of ideas tame the power of the state? *International Studies Review*, *13*(1), 34–45. https://doi.org/10.1111/j.1468-2486.2010.00996.x

Tocci, N. (2020). Resilience and the role of the European Union in the world. *Contemporary Security Policy*, *41*(2), 176–194. https://doi.org/10.1080/13523260.2019.1640342

Tolchin, M. (1980, September 19). House votes to block shipment of Uranium for India. *The New York Times*.

Tzeng, P. (2013). Nuclear leverage: US intervention in sensitive technology transfers in the 1970s. *Nonproliferation Review*, *20*(3), 473–492. https://doi.org/10.1080/10736700.2013.852783

UNSC. (1991, August 15). *United Nations Security Council Resolution 707*. https://www.un.org/Depts/unmovic/documents/707.pdf

U.S. Department of State. (1974, February 18). Telegram TOSEC 794/104621 from the department of state to the mission to the international atomic energy agency. *2238Z, Nixon-Ford Administrations, FRUS, 1969-1976, Vol. E-8, Doc. 162*.

U.S. Department of State. (1977, May 28). 75. Memorandum of conversation. Foreign relations of the United States, 1977–1980, Volume XIX, South Asia. Retrieved from https://history.state.gov/historicaldocuments/frus1977-80v19/d75

U.S. National Security Council. (1974, May 23). *National Security Study Memorandum [NSSM] 202, Nixon–Ford Administrations, FRUS, 1969–76, Vol. E-14, doc. 50*.

Van Wyk, M. S. (2007). Ally or critic? The United States' response to South African nuclear development, 1949–1980. *Cold War History*, *7*(2), 195–225. https://doi.org/10.1080/14682740701284124

Wagner, W., Werner, W., & Onderco, M. (2014). Rogues, pariahs, outlaws: Theorizing deviance in international relations. In W. Wagner, W. Werner, & M. Onderco (Eds.), *Deviance in international relations: "Rogue states" and international security* (pp. 1–14). Palgrave Macmillan.

Walker, J. S. (2001). Nuclear power and nonproliferation: The controversy over nuclear exports, 1974–1980. *Diplomatic History*, *25*(2), 215–249. https://doi.org/10.1111/0145-2096.00260

Walker, W. (2007). Nuclear enlightenment and counter-enlightenment. *International Affairs*, *83*(3), 431–453. https://doi.org/10.1111/j.1468-2346.2007.00630.x

Wan, W. (2014). Firewalling nuclear diffusion. *International Studies Review*, *16*(2), 217–228. https://doi.org/10.1111/misr.12133

Wiener, A. (2004). Contested compliance: Interventions on the normative structure of world politics. *European Journal of International Relations*, *10*(2), 189–234. https://doi.org/10.1177/1354066104042934

Wiener, A. (2009). Enacting meaning-in-use: Qualitative research on norms and international relations. *Review of International Studies*, *35*(1), 175–193. https://doi.org/10.1017/S0260210509008377

Wiener, A. (2014). *A theory of contestation*. Springer.

Wunderlich, C. (2020). *Rogue states as norm entrepreneurs: Black sheep or sheep in wolves' clothing?* Springer.