The Treaty is Out of the Bottle: The Power and Logic of Nuclear Disarmament

Merav Datan\textsuperscript{a} and Jürgen Scheffran\textsuperscript{b}

\textsuperscript{a}International Lawyer, Pardes Hannah, Israel; \textsuperscript{b}Institute of Geography, CEN, University of Hamburg, Germany

ABSTRACT

The nuclear genie is out of the bottle, manifesting as nuclear proliferation. Efforts to contain it have generated another genie whose agenda is to establish a verifiable nuclear disarmament regime. Despite several achievements and remarkable stability, the limits of the nuclear arms control and non-proliferation regime have become evident. In the mid-1990s, therefore, civil society, in cooperation with governments and international organizations, launched a concerted effort to promote nuclear abolition. Immediate results included the 1996 International Court of Justice advisory opinion on the legality of nuclear weapons and the 1997 Model Nuclear Weapons Convention (Model NWC). Two decades later the 2017 Treaty on the Prohibition of Nuclear Weapons (Ban Treaty) creates a legal framework and provides a platform to develop a negotiating process and norm-building instruments for a nuclear-weapon-free world. Drawing on international legal theory and international relations theory (and their critiques of each other), this article examines the normative value, logic and power of nuclear disarmament. Taking the existing regime as a reference point, we compare the elements and implications of the Ban Treaty and Model NWC, and draw conclusions across various dimensions, including elements of the treaties and their approaches to elimination, verification, compliance and organization.

ARTICLE HISTORY

Received 18 July 2018
Accepted 7 February 2019

KEYWORDS

Treaty on the prohibition of nuclear weapons; nuclear weapons convention; international law; international relations; norms; nuclear disarmament

Introduction

We live in a nuclear age. The genie is out of the bottle – the proverbial nuclear genie of knowledge and technology that cannot be unlearned or undone, and the physical nuclear materials in various forms, some with half-lives stretching far longer than recorded human history. Future generations will have to address these problems even in the best of all possible scenarios given the alternatives the nuclear age poses. Unforeseeable as the future of nuclear non-proliferation and disarmament is, there is one certainty: the human know-how and physical means to destroy the world, portions of it, or various life forms exist. The vast applications of this know-how and technology cannot be un-invented, and their political role in international relations cannot be denied. They embody physical and political powers that have preoccupied research and discourse in a range of disciplines for more than seven decades.
The nuclear era – from the bombings of Hiroshima and Nagasaki, the creation of the United Nations (with its very first General Assembly resolution calling for the elimination of nuclear weapons), the subsequent Cold War of half a century or so and its conclusion nearly three decades ago, to today – has seen developments in both directions, towards both proliferation and disarmament. It has seen developments that can be explained by realpolitik and utilitarian interests as well as developments that can be explained by proactive norm building and the organized pursuit of ideals. The nuclear era has put facts on the ground at a rate exceeding the human capacity to cope with political problems posed by the inherent physical and political power of nuclear materials, knowledge and technology. Thus we live in a nuclear age and there is no going back. Moreover, the potential physical power of nuclear material and technology has translated into political power and shaped international relations, challenging international law at every level – the law of peace and security, based on the UN Charter, and the nuclear non-proliferation regime, based on the Non-Proliferation Treaty (NPT). The goal of nuclear disarmament, also a stated element of the NPT, appears impossible in face of the nuclear genie, who, according to cynics as well as self-proclaimed realists, has escaped the bottle. In their view, disarmament is idealistic or impossible, proliferation is irreversible or at best somewhat containable, and there will always be States that seek the political power inherent in having a nuclear capability, we are told.

This article posits that there is another genie of the nuclear age, one with an alternative agenda. Its powers are of a different nature because it has reflected on the lessons of the nuclear age. The disarmament genie has observed the structures of power and dynamics of change of the nuclear age, and has cultivated its own powers for affecting the international system. The Treaty on the Prohibition of Nuclear Weapons (TPNW or Ban Treaty\(^1\)) is one product of this power. This treaty, often dismissed as purely symbolic or solely normative at best, provides an opportunity to look at the forces that brought it about and examine its value precisely as a norm-building instrument. The treaty starkly highlights the question of normative value itself – that is, the very value of international legal instruments and norms. Among the critics of international law and international legal theorists are political realists and international relations theorists. This article therefore draws on international legal (IL) theory as well as international relations (IR) theory, and the correlation between them, to address the question of normative value in general and as applied to the Ban Treaty specifically, with the aim of better understanding the implications of the latter for the non-proliferation regime as it exists and for future proliferation or for disarmament as represented by a Nuclear Weapons Convention (NWC).

The next two sections describe the background, context and process of the evolving regime and present a theoretical framework that seeks to identify indicators by which IR and IL theories can be applied to the developments and players that have shaped the nuclear disarmament regime of the past two decades: normativity, compliance and effectiveness. We then look at differences between a proposed comprehensive regime and the actual regime adopted. Finally we apply the indicators from the theoretical framework to the process described and the elements examined in the other sections.

\(^1\)https://www.un.org/disarmament/wmd/nuclear/tpnw/.
Challenges to the Current Nuclear Disarmament Regime

The current regime for nuclear disarmament is framed by the Non-Proliferation Treaty, signed in 1968 and ratified in 1970. The NPT limits the number of Nuclear Weapon States (NWS) to the United States, Russia, the United Kingdom, France and China, which are also the five permanent (P5) members of the UN Security Council. All other State parties relinquished the nuclear weapons option and in return received two commitments: the “inalienable right” to use nuclear energy (Art. IV) and an obligation on the part of the NWS to end the arms race and dismantle their arsenals (Art. VI). The effectiveness of the NPT is restricted by the double standard applied to nuclear “haves” and “have-nots” and by the spread of “peaceful” nuclear energy, which has contributed to the proliferation of nuclear weapons because of its dual use applications – civil and military – despite controls by the International Atomic Energy Agency (IAEA). The NPT did not prevent a nuclear arms race, nor have the NWS disarmed (INESAP 1995).

These deficiencies have challenged the effectiveness of the NPT regime from the outset. Some States were able to pursue nuclear weapons activities outside the regime (Israel, India, Pakistan) and others by exploiting it (Iraq, North Korea, Iran), concealing their activities behind nuclear power programs. Five years after the Cold War ended, at the Review and Extension Conference in May 1995, the international community affirmed the NPT as the cornerstone of the universal regime to address the challenges of the nuclear age, with conditions, terms and negotiations over which debates continue. The 1995 indefinite extension of the NPT marked the consolidation of the non-proliferation regime, with the renewed promise of disarmament (Art. VI) in exchange for permanence of the regime (indefinite extension).

The NPT complements other elements of nuclear arms control and disarmament, including the Nuclear-Weapon-Free Zones (NWFZs), the Comprehensive Test Ban Treaty (CTBT), the Intermediate-Range Nuclear Forces (INF) Treaty, the Strategic Arms Reduction Treaty (START) and the Strategic Offensive Reductions Treaty (SORT) or Moscow Treaty, as well as international law to control other weapons of mass destruction, the Chemical Weapons Convention (CWC) and the Biological Weapons Convention (BWC). Although the existing non-proliferation and disarmament regime slowed down the spread and development of nuclear weapons and made first cuts into nuclear arsenals possible, it does not provide a practical path towards a nuclear-weapon-free world and, in fact, perpetuates the nuclear threat as long as it can be used to claim that the possession of nuclear weapons is legitimate.

What has happened in the nuclear disarmament regime since the indefinite extension of the NPT? What are the lessons of the past two decades regarding the existing nuclear regime from a current vantage point, following the adoption of the Ban Treaty?

Besides developments in the governmental sphere, the mid-1990s marked important milestones in the history of nuclear disarmament in the sphere of civil society, which acted as a driving force, operating through official channels and learning the language of legal instruments, political negotiations and diplomatic exchange. The 1995 NPT Review Conference became a catalyst, bringing together a critical mass of non-governmental organizations (NGOs), which established the global network Abolition 2000, calling for negotiations on a Nuclear Weapons Convention to prohibit and eliminate all nuclear weapons. Such a treaty would ban the final category of weapons of mass destruction,
following the bans on biological and chemical weapons. Thus began a political chain reaction towards the abolition of nuclear weapons, which included protests against nuclear testing, the fiftieth anniversaries of Hiroshima and Nagasaki, the 1995 Nobel Peace Prize awarded to Joseph Rotblat and the Pugwash movement, the Canberra Commission on the Elimination of Nuclear Weapons, and the Middle Powers Initiative and the New Agenda Coalition in 1997, among other developments.

Two activities deserve particular emphasis. First, driven by worldwide civil society activities – research, campaigning, advocacy, letter writing and faxing, evidence gathering, networking and lobbying at domestic and international levels, and at the request of the World Health Organization and UN General Assembly – the International Court of Justice (ICJ) issued an advisory opinion in July 1996: “The threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law”. The ICJ also affirmed the “obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control” (ICJ 1996).

Second, building on the ICJ advisory opinion, in December 1996 a large majority of States voted in favour of a UN General Assembly resolution calling for negotiations on a Nuclear Weapons Convention to ban and eliminate all nuclear weapons. In the same year, a consortium of lawyers, scientists and disarmament experts convened to draft a model NWC, which was released at the NPT Preparatory Committee Conference (PrepCom) on 7 April 1997, and subsequently submitted by Costa Rica to the United Nations as a UN discussion document (Datan et al. 1999; Scheffran and Datan 1997).

Despite these opportunities, the NWS and their allies continued to resist the elimination of nuclear weapons, and the political conditions for nuclear disarmament deteriorated after 1997. Nuclear testing by India and Pakistan in 1998 (and by North Korea in 2006) as well as missile testing by Iran and North Korea played into the hands of those who shifted the coordinates towards military strength, including missile defence, space weaponization and new strategic doctrines. The Bush administration pushed ahead with research on new nuclear weapons, including mini-nukes and bunker busters. In this environment the terrorist attacks of 11 September 2001 and the WMD pretext of the war in Iraq triggered a chain of violent events with fading prospects for nuclear disarmament. Further indications include the stalemate since 1997 at the Geneva Conference on Disarmament (CD) and lack of progress on a Fissile Material Cutoff Treaty (FMCT) and on nuclear arms reductions between the United States and Russia, symbolized by abandonment of the Anti-Ballistic Missiles Treaty in 2002.

After a decade of lost opportunities for disarmament, new initiatives began to emerge at the governmental and non-governmental levels, notably the Weapons of Mass Destruction Commission, chaired by Hans Blix, the 2007 Gang-of-Four statement by Henry Kissinger, Sam Nunn, George Shultz and William Perry, which was replicated in several countries, speeches by UK Foreign Secretary Margaret Beckett and newly elected US President Barack Obama, and the Global Zero initiative, to mention a few. In this environment a revised Model NWC, prepared by a new drafting committee (Datan et al. 2007) was released on 30 April 2007, at the NPT PrepCom in Vienna by the International Campaign to Abolish Nuclear Weapons (ICAN) on the occasion of its own international launch. In October 2008, UN Secretary-General Ban Ki-moon presented a five-point plan for nuclear disarmament that includes “a framework of separate, mutually reinforcing
instruments” or “negotiating a nuclear-weapons convention” (UNODA 2008). New momentum has built since 2010 through increased cooperation between governments and civil society on the humanitarian dimensions of nuclear weapons, and in a resolution of 23 December 2016, the UN General Assembly decided to hold a conference to negotiate a Ban Treaty. Led by Costa Rica, the Treaty on the Prohibition of Nuclear Weapons was finalized in New York on 7 July 2017, and adopted by 122 States, not including the nuclear-armed States and their allies. The Ban Treaty, opened for signature on 20 September 2017, will enter into force after ratification by 50 countries. That same year, ICAN was awarded the Nobel Peace Prize, highlighting both the role and drive of civil society in promoting nuclear disarmament, as well as the imperative and perceived importance of this goal at the global level.

The abovementioned milestones built on international law and, in turn, contribute to its development. The evolution of a legal regime and the discourse relating to nuclear non-proliferation and disarmament over the past two decades reveal changes in substance (new and proposed instruments) as well as form (greater inclusion of civil society). At the same time, resistance to nuclear disarmament appears entrenched among States that possess nuclear weapons or insist on maintaining the option, which naturally hold the key to nuclear disarmament as a matter of both policy and practice. These developments reflect conflicting trends and competing interests, which this paper aims to explore through a framework that borrows selectively from both international relations theory and international legal theory, drawing on the former mainly for its authoritative descriptive scholarship, and on the latter for its normative analysis and guidance. In so doing, we consider where they are congruent and where they depart in ascribing value to a treaty on nuclear disarmament and the Ban Treaty specifically.

Theoretical Framework: The Real and the Ideal

International Relations theory, which is centred on national interests, helps explain the resistance to nuclear disarmament (nuclear-armed States perceive it as running counter to their national security policy). It focuses on utilitarian interests, including political power, as drivers of policy. The realist school, in particular, is useful as a descriptive tool, highlighting the obstacles and resistance to regime change – in this case the global regime for nuclear disarmament – and it explains the absence of political will by focusing on perceived national interests, including in the area of nuclear disarmament (Datan 2003). International Legal theory is centred on collective interests and global survival. It is, for our purposes, mainly a normative tool used to identify actors and processes that aim to protect and promote universal human interests through the law. Borrowing elements of IR and IL theories to represent the tension between the real and the ideal, we propose an analytical framework that recognizes the dominance of IR theory in describing the current state of affairs – namely, the existence of nuclear weapons and the threat of proliferation – while relying on IL theory, including its response to IR critiques, to assess the value of norm-based remedies to this state of affairs – namely, nuclear disarmament efforts based on legal instruments.

Although we refer to IR or IL theory, each is actually a range of theories or schools of thought. Within IR, the realist approach would offer a critique based on perceptions of power and the national interest, and we rely on it here for its authority as representative of critical perspectives and scholarship against disarmament centred on legal instruments.
The constructivist approach, in contrast, is concerned with the process of norm building and is presumably compatible with the normative approach proposed here. A constructivist analysis of nuclear weapons would require a separate exploration of States’ commitment to their constructed social purposes of identity and interests in maintaining power, prestige and dominance (Van Wyk et al. 2007). IL theory, likewise, is not uniform: the positivists of IL, along with various other observers among the occasionally overlapping, occasionally conflicting schools of IL and IR theories, would dismiss the value of the Ban Treaty even after entry into force as long as it has no nuclear-armed State parties.

**Utilitarianism vs. Normativity**

The main criticism of the TPNW (and the Model NWC) is that it is not “realistic” and, indeed, of little or no value absent the participation of nuclear-armed States because they hold the key to nuclear disarmament. Moreover, according to this view, States are driven by utilitarian interests and thus nuclear-armed States will not bind themselves to a treaty for the prohibition and eventual elimination of nuclear weapons until and unless they perceive it to be in their interests. Because they perceive nuclear weapons as a central element of their national security doctrines, they will not commit to a disarmament treaty, and because they are not party to such a treaty, they cannot be compelled to disarm.

Law is centred on norms rather than utilitarian interests – that is, on defining and defending authoritative standards set by society in order to serve society. Norms may or may not be codified in law. Normativity refers to the sense that a particular standard, or norm, is desirable or even obligatory and that violating that standard is undesirable or even illegal. In the case of international law, norms might evolve through practice and thus become customary international law. The Law of the Sea, for example, emerged as a body of customary law that was eventually codified by the Convention on the Law of the Sea. Alternatively, norms might be adopted directly, through negotiations, as elements of legally binding instruments, that is, treaties. When a norm has the status of a peremptory norm, it is considered to be binding even on parties that have not specifically committed to that norm. The prohibition on the threat or use of force is an example of a peremptory norm in international law. This does not mean that violations do not occur but, rather, that it is incumbent upon the law to remedy them.

International legal theorists recognize that the rules of international law are not always obeyed. Non-compliance has long been a salient theme in international legal scholarship (Brownlie 1963; Franck 1970). Nor are IL theorists unaware of the criticism of IR theorists. As long ago as 1984, Oscar Schachter, a leading international legal scholar and a legal counsellor at the United Nations at the time of its inception, observed, “When the UN Charter was adopted, it was generally considered to have outlawed war. States accepted the obligation to settle all disputes by peaceful means and to refrain from the use or threat of use of force in their international relations. . . . These provisions were seen by most observers as the heart of the Charter and the most important principles of contemporary international law. . . . Yet as we are all acutely aware, there is widespread cynicism about their effect. Reality seems to mock them” (Schachter 1984, 1620). His observations apply to nuclear weapons as well, and his description of critiques of the UN Charter recall critiques of legally based disarmament efforts: “Threats of force, open or implicit, pervade the relations of States. The menace
of a nuclear holocaust hangs over all nations, great or small. . . . It is no wonder that the obligations of the Charter are widely seen as mere rhetoric, at best idealistic aspirations, or worse as providing a pretext or ‘cover’ for aggression” (1620).

**Compliance vs. Effectiveness**

IR conceptualizations of international law-making and legal interpretation have several shortcomings (Dunoff and Pollack 2012, 2): they focus “almost exclusively” on treaties and institutions as law-making fora, overlooking the role of non-state actors, and on courts as the bodies that interpret and apply international law, overlooking other agencies such as committees, councils and subsidiary treaty bodies, political agencies and NGOs (2, 33), all of which might play a part in the interpretation and implementation of international law. Moreover, “IR studies of compliance typically assume that legal texts are unambiguous and that international law’s effects are most relevantly measured in terms of state behavior that is (or is not) consistent with the terms of international agreements” (2).

International lawyers, in contrast, conceptualize law more broadly, as a pluralistic process that incorporates a range of institutions, actors and social discourses (Dunoff and Pollack 2012, 21). State compliance is not the only measure of law’s effectiveness (36). Howse and Teitel (2010) have identified several other indicators of the effects of IL, including its potential to influence how policymakers view international problems (130). IL norms can also influence bargaining or negotiations among States as well as non-state actors, even if not directly bound by specific rules, because parties “bargain in light of” these norms (132). Thus, “different conceptions of law direct attention to different effects that law has on both States and non-state actors, which a narrow focus on compliance is likely to miss” (Dunoff and Pollack 2012, 34).

International law does not ignore the harsh realities of politics. In fact, it is pre-occupied with them, as its entire raison d’etre is to ensure society’s survival. It seeks to understand why the law is violated or ignored in order to remedy the situation. The descriptive value of IR serves the normative aim of IL: the point of understanding why things do not work, why laws are broken, is to devise better laws. The remedy lies not only in implementation through enforcement but in developing a deeper and more expansive concept of compliance, assessing the value of the law in terms of effectiveness in addition to compliance, and developing a better understanding of the role of normativity in international dynamics and the development of legal regimes. The developments outlined above, culminating in adoption of the TPNW, embody and reflect these concepts, as the following two sections aim to demonstrate.

**The Real and the Ideal: From Non-Proliferation and Disarmament to Prohibition and Elimination of Nuclear Weapons**

In the aftermath of the adoption of the Ban Treaty, we are well positioned to take a retrospective view of the nuclear non-proliferation and disarmament regime over the past two decades and evaluate this evolving regime. Here we examine the elements, significance and value, as well as political circumstances, of the Ban Treaty as it compares with the current non-proliferation and disarmament regime and with a potential future NWC regime.
The framework proposed here, if systematically applied, would require that a comparison across different regimes over time examine not only the elements of the NPT, TPNW and NWC but also the processes and participants behind the advancement, adoption or implementation of each, as the case may be. A review along these dimensions should shed light on the conditions and challenges for nuclear non-proliferation and disarmament (what worked and what did not) and highlight the commonalities and differences between non-proliferation and disarmament as ultimate goals. Because a thorough comparison would be a complex multidimensional exercise, beyond the scope of this article, we will focus on selected elements and aspects.

The Ban Treaty is first and foremost a statement of political will, extending the NPT regime towards prohibition and laying the foundation for a comprehensive nuclear-disarmament regime that combines prohibition with verified elimination. The Model NWC in effect isolated and set aside the question of political will in order to explore the legal and technical requirements of complete nuclear disarmament. In combination, the actual treaty and the model treaty provide the foundation for an effective and verifiable regime for the prohibition and elimination of nuclear weapons. The complementarity of these agreements is discussed below in relation to specific elements.

**Prohibited Activities**

The prohibition norm of Article 1 of the TPNW is quite comprehensive, banning most activities related to a nuclear weapons capability: develop, test, produce, manufacture, otherwise acquire, possess or stockpile; transfer, receive and control; use or threaten to use; assist, encourage or induce to engage; seek or receive assistance; allow stationing, installation or deployment of any nuclear weapons or other nuclear explosive devices (NWED) in its territory or at any place under its jurisdiction or control. Some activities are not prohibited (knowledge, research, design, finance). Differences with respect to the existing regime as well as the Model NWC are discussed next.

Threat of use: The prohibition on the threat of nuclear weapons strengthens the stigmatization of nuclear weapons, delegitimizes nuclear deterrence and reinforces international humanitarian law (IHL), the UN Charter prohibition on the threat of force, Protocol I to the Geneva Conventions and the ICJ advisory opinion. During TPNW negotiations a few States found the UN Charter sufficient, while several States supported inclusion of a prohibition against threat so as to challenge nuclear deterrence and reinforce the illegality of threat under existing law. The Preamble of the Ban Treaty, as eventually adopted, refers to the UN Charter prohibition on the threat of force, emphasizes the danger of nuclear weapons and expresses deep concern about the “catastrophic humanitarian consequences” of any use of nuclear weapons, including the “unacceptable suffering of and harm caused to the victims of the use of nuclear weapons (hibakusha)”. All States “share the responsibility to prevent any use of nuclear weapons” which would be “contrary to the rules of international law applicable in armed conflict, in particular the principles and rules of international humanitarian law” and the “rules for the protection of the natural environment”. In Article 4d each State Party undertakes never under any circumstances to: “use or threaten to use nuclear weapons or other nuclear explosive devices”. The Model NWC proposes prohibiting “engage[ment] in any military or other preparations to use nuclear weapons” and it
takes “the threat of use of nuclear weapons” to mean any act that creates a perception that a nuclear weapon may or will be used.

Research, development, testing and design: Preparing for a nuclear weapons capability requires research, design, development and testing. Knowledge of nuclear weapons development is driven by scientific-technical progress in many different areas, including laboratory testing, laser enrichment and computer simulations. Since the beginning of the nuclear age there have been efforts to restrain nuclear testing, culminating with the 1996 Comprehensive Nuclear-Test-Ban Treaty (CTBT). The TPNW preamble recognizes the vital importance of the CTBT and its monitoring system, and Article 1 confirms the prohibition of any nuclear weapon test explosion or any other nuclear explosion. More ambitious than the TPNW, the Model NWC takes nuclear weapons testing to mean nuclear explosions, computer simulations, hydrodynamic and hydronuclear tests to simulate behaviour of nuclear materials, warheads and other nuclear weapons components under nuclear explosive conditions, and sub-critical testing (Model NWC). These activities may contribute to the knowledge and design of particular warheads, but the control of nuclear weapons R&D has been largely neglected in existing control regimes. While R&D is prohibited in recent NWFZ treaties (Pelindaba and Semei), the TPNW prohibits development but not research, expert knowledge or design of nuclear weapons. The Model NWC prohibits state funding of nuclear weapons research (with the exception of nuclear disarmament research), although for pragmatic and ethical reasons it does not explicitly prohibit such research, which is defined as “experimental or theoretical work undertaken principally to acquire new knowledge going beyond publicly available information of phenomena and observable facts directed toward understanding, development, improvement, testing, production, deployment, or use of nuclear weapons” (Model NWC Art. II(F)). Development includes engineering leading to production, while design is related to the creation of a warhead. To “contain” the genie of nuclear weapons knowledge, scientists and technicians commit to not transfer their expertise and to abide by criteria for peaceful purposes. Not prohibited is research on disarmament verification, or research on non-nuclear military matters such as hardening conventional weapons systems against nuclear weapons effects. The question is whether a verifiable nuclear firewall in R&D can be drawn and dual-use technology can be controlled without banning civilian activities (Dalton et al. 2017, 6).

Production, acquisition and manufacture are rarely included in existing treaties. The NPT only expressly prohibits manufacture of nuclear weapons. The Ban Treaty prohibits any activity to “produce, manufacture, otherwise acquire” NWED (Art. 1a). The Model NWC (Art. 1) explicitly mentions facilities that can produce nuclear materials, facilities that can handle or fabricate nuclear components or can transform components back into fissile materials, civil facilities that can fabricate fissile materials into fuel, and facilities where nuclear warhead components are assembled or disassembled. A nuclear weapons production facility would include facilities for the production of non-nuclear. There is also a requirement to cease production of proscribed nuclear material (with the exception of “exemption quantities” as defined), nuclear weapon components and equipment in the Annex.

Possession, deployment and stockpiling: To move beyond nuclear deterrence, a prohibition on possession is essential, as in the NWFZ treaties. The TPNW prohibits the possession or stockpiling (Art. 1a) as well as “any stationing, installation or deployment” (Art. 1g) of NWED in its territory or at any place under its jurisdiction.
or control. In addition, any State Party must declare “whether it owned, possessed or controlled” NWED (Art. 2a), which is an important precondition for nuclear-armed States to dismantle their arsenals. The Model NWC provides more specification in its definition of deployment, which includes the preparation or maintenance of a nuclear weapon for possible use by placing it on, in or near a delivery system, or moving it to or maintaining it at a location suitable for delivery to a target (MNWC 2007, Art. II.46).

Transit, finance and assistance: States are obligated by UN Security Council Resolution 1540 to adopt measures, including controls on transit and financing, to prevent non-state actors from trafficking in nuclear, biological and chemical weapons and their means of delivery, including related materials. During the TPNW negotiations, seeking to contain reliance on nuclear weapons by States outside the treaty, civil society supported a prohibition on transit and financing, beyond the requirements of the NWFZ treaties (Burroughs 2017). A number of States opposed the inclusion of such a prohibition, which would necessitate resolution of difficult practical issues such as demarcation of maritime and air space. A transit prohibition would need assurance that nuclear weapons or their components do not traverse the territory of a member State and its air and water, and might raise issues with respect to activities of nuclear-armed States (Burroughs 2017, 9). During TPNW negotiations there was widespread support, following the model of the CWC and the Treaty of Tlatelolco, for a prohibition on assistance, requiring members to refrain from cooperation on nuclear weapons with States outside the treaty, which would be particularly relevant to a State in a military alliance with nuclear-armed States (10). A prohibition on finance was seen as too complex and demanding if it requires States to regulate actions of persons under their jurisdiction (11). The TPNW prohibits directly or indirectly “transfer[ing] to any recipient” or “receiv[ing] the transfer of or control over” NWED (Art. 1b/c). Thus, treaty members may not transfer or host nuclear weapons, as certain members of NATO do under nuclear-sharing arrangements.

Nuclear weapon materials: Any agreement to prohibit nuclear weapons should constrain and reverse access to nuclear-weapons-usable fissile material, such as highly enriched uranium (HEU with a fraction of U-235 defined as weapons-grade) and plutonium (with a specified fraction of Pu-239), building a barrier to the acquisition of a “significant quantity” of weapons-usable material required for nuclear weapons production. The TPNW does not explicitly prohibit nuclear weapons materials, which are implicitly included as part of nuclear weapons. Articles 4.1 and 4.3 require States “to conclude a safeguards agreement with the International Atomic Energy Agency sufficient to provide credible assurance of the non-diversion of declared nuclear material from peaceful nuclear activities and of the absence of undeclared nuclear material or activities”.

Specifying the prohibition on the production, stockpiling and use of nuclear-weapons-usable materials in a Fissile Material Cutoff could be an important supplement, either within the TPNW framework or as a separate treaty to prohibit the production of materials for NWED, while the production of nuclear material for non-weapons purposes is not prohibited. The Model NWC offers ideas regarding special nuclear materials (the most crucial elements of nuclear weapons and usable in creating nuclear explosions), including any fissionable material (i.e., isotopes that may undergo either spontaneous or induced fission) or fusible material (i.e., isotopes capable of undergoing nuclear fusion under sufficient conditions of pressure, temperature and inclusion time). The proposed Model NWC obligation to place special nuclear materials under international control aims to
protect against diversion of such materials, with the transfer of prohibited material restrained for the efficient or safe disposal of this material. Controlling the infrastructure to produce nuclear weapons includes reprocessing and uranium enrichment. All nuclear facilities and special nuclear material would be placed under “preventive controls”, which are more comprehensive than IAEA safeguards.

Nuclear energy and phase-out: The NPT recognizes an “inalienable right” to develop and use nuclear power, at the cost of a comprehensive safeguards system and ever-increasing quantities of nuclear materials. The recognition of this right does not preclude the prohibition and elimination of nuclear weapons through the TPNW and a future NWC, which can coexist with the use of nuclear energy. However, constraints on or even a phase-out of nuclear power could stop the spread of nuclear materials, diminish latent capabilities and facilitate the verification task of “unmaking the bomb” (Feiveson et al. 2014, 17), which might be acceptable to some States (like Germany) but is at present unacceptable to others. Towards this end, the Model NWC proposes an optional protocol offering assistance in sustainable, non-nuclear energy for States that forego the nuclear power option.

**Affirmative Obligations**

Disarmament and elimination: Several US-Russian treaties explicitly deal with the disarmament of nuclear weapons (INF, START). The BWC and CWC offer models for elimination of weapons of mass destruction. The elimination of nuclear weapons was identified as a goal in the UN resolution calling for the Ban Treaty, which stressed that “the irreversible, verifiable and transparent destruction of nuclear weapons would be needed in order to achieve and maintain a world without nuclear weapons” (UNGA 2017). During the Ban Treaty negotiations, some States, including Ireland, the Philippines and Sweden, called for specific disarmament and monitoring requirements of nuclear weapon possessors as part of the treaty or a separate protocol; others, including Egypt and Malaysia, suggested timeframes and procedures for complete, irreversible and verifiable elimination of nuclear weapons (Meier, Cordes, and Suh 2017).

The TPNW includes general commitments to the elimination of nuclear weapons, following the logic that a prohibition requires elimination, which in turn strengthens the prohibition. Article 2 requires each party to declare whether it had possessed or controlled and then eliminated nuclear weapons, or had eliminated or converted related facilities. Article 4.2 provides that a State Party that “owns, possesses or controls nuclear weapons or other nuclear explosive devices shall immediately remove them from operational status, and destroy them … in accordance with a legally binding, time-bound plan for the verified and irreversible elimination of its nuclear-weapon programme, including the elimination or irreversible conversion of all nuclear-weapons-related facilities”. Nuclear-armed states may disarm prior to joining the treaty, subject to verification of their disarmed status, or may join the treaty and disarm by agreed plan and subject to verification, leaving no single nuclear warhead and no significant quantity of nuclear-weapons-usable material. Once nuclear-armed States are disarmed, their latent capabilities need to be contained and controlled to prevent breakout, which is particularly challenging for the most advanced nuclear powers (Scheffran 2018, 5).

Some guidance on the legal framework for the transition from prohibition to elimination of nuclear weapons is offered by the Model NWC in Article I.2, whereby each State Party
would undertake to destroy all nuclear weapons it owns or possesses, or that are located in any place under its jurisdiction or control (a); all nuclear weapons it has abandoned on the territory of another State (b); all nuclear weapons facilities it owns or possesses, or that are located in any place under its jurisdiction or control, or to convert facilities to weapons destruction facilities or other facilities not prohibited by this Convention (d). Preventive controls are applied to all nuclear facilities (c) and all special nuclear material (g).

Delivery systems and command and control: To promote the elimination of nuclear weapons and provide greater confidence against breakout, the narrow approach of controlling only nuclear warheads could be expanded to the entire system of nuclear weapons, including delivery vehicles and command and control systems. Considerable experience has been acquired for the control of US–Soviet/Russian delivery systems under arms control agreements, notably the INF and START treaties. The NPT preamble refers to “the elimination from national arsenals of nuclear weapons and the means of their delivery”. The Missile Technology Control Regime (MTCR) primarily restrains the export of advanced missile technology. During Ban Treaty negotiations, the issue of delivery systems was seen as too complicated and received little attention. The TPNW therefore circumvents this issue, leaving it to future negotiations after nuclear-armed States have joined the treaty.

The Model NWC proposes an obligation to “destroy or convert for purposes not prohibited under this Convention all nuclear weapons delivery vehicles and nuclear weapon components” (Art. I.2.f). This applies to delivery vehicles designed for or capable of delivering a nuclear weapon, which with the warhead forms the entire weapon system, for example a complete Intercontinental Ballistic Missile (ICBM). This obligation does not prohibit or require conversion of (commercial) dual-use delivery vehicles that can be reconverted to a non-nuclear capability with little effort, notably space launch vehicles (SLVs). Accordingly, the Model NWC also proposes an additional optional protocol prohibiting destabilizing dual-use delivery vehicles. One of the main problems to be addressed is the availability of technology for delivery systems in commercial dual-use items and conventional arms, which can be converted to nuclear-capable ballistic missiles.

Similarly, command and control systems for nuclear weapons raise difficult issues and are not considered in the TPNW. In the Model NWC, the obligation to disable or destroy these systems, or convert them to purposes not prohibited, is offered as an optional provision in Article I.2.e. The dual (conventional-nuclear) function and military sensitivity of these facilities might make verifiable implementation of this provision challenging. Short-term stabilizing measures could include (Art. XI.8): (a) rescinding alert status on all nuclear weapons; (b) removing targeting coordinates from all command and control systems; and (c) removing navigational information for all nuclear-armed missiles from the navigational systems. The Model NWC provides that each State Party shall “destroy any facility, system or sub-system designed or used solely for the purpose of launching, targeting, directing or detonating a nuclear weapon or its delivery vehicle, or for aiding or assisting in any of these purposes” (Model Nuclear Weapons Convention 2007, Art. XI.9).

Phases of implementation: While the TPNW does not specify an implementation process for prohibiting and eliminating nuclear weapons, the Model NWC, in Art. IV, proposes a flexible series of five coordinated phases for implementation over three decades, beginning with short-term stability measures: taking nuclear weapons off alert; removing weapons from deployment and nuclear warheads from their delivery vehicles; disabling the warheads;
removing and disfiguring the “pits” and placing the fissile material under international control; and closing or converting production, research and testing facilities. Medium-term measures include proportional deep cuts by nuclear-armed States, followed by the closure or conversion of facilities for production of HEU or plutonium, and placing these under strict, effective and exclusive international control, ultimately eliminating all nuclear weapon capabilities. The suggested deadlines are recommendations to be negotiated, based on evaluations of technical feasibility.

Other affirmative obligations: The negotiations on the Ban Treaty emerged from conferences on the humanitarian consequences of nuclear explosions, the recognition that the nuclear-armed States are responsible for harm to individuals and the environment, and the widespread support for the rights of and assistance to victims, following the precedents in the treaties on landmines and cluster munitions. Consequently, the treaty includes provisions on assistance to these victims. Other affirmative obligations concern environmental remediation, international cooperation and reporting on and assistance in treaty implementation while additional provisions (e.g., disarmament education and raising awareness of risks) are referenced in the preamble.

Verification and Compliance

To provide timely warning of non-compliance and build confidence in treaty effectiveness, it is necessary to verify the prohibition and elimination of nuclear weapons across the various stages of the nuclear weapon lifecycle. The main aspects of this complex and challenging task are the detection of breakout leading to the development or manufacturing of nuclear weapons, and the monitoring of nuclear weapons non-acquisition and elimination. The Ban Treaty follows an adaptive approach and focuses on those aspects of the monitoring and verification of compliance that are most feasible, leaving the complex details to future negotiations when nuclear-armed States join the Treaty (Scheffran 2018). The TPNW largely relies on the safeguards system of the NPT and the NWFZ treaties for verification. The Model NWC, in contrast, proposes a comprehensive and iterative verification system, including the phases of declaration, monitoring, inspection and enforcement. Specific elements include a registry and monitoring system; on-site inspections and techniques; nuclear safeguards in combination with preventive controls; transparency, confidence-building and dispute settlement; societal verification; organizational verification and an implementing agency. Among these interlocking mechanisms, technical instruments serve specific tasks of verification (Kalinowski, Liebert, and Scheffran 2000; Mian, Patton, and Glaser 2017; Scheffran 2018), including remote sensing in the visible, infrared and radar range of the electromagnetic spectrum; seismological, radiological, hydroacoustic and infrasound detectors; sensors for close-up observation; cooperative verification (exchange of information, inspections, preventive controls, joint overflights). There is a role for technical barriers to the diversion and illegal acquisition of nuclear-weapon-usable material from stocks and flows for the construction of nuclear weapons and for procedures to ensure they are not used for prohibited activities.

Implementation, organization and enforcement: The TPNW offers implementation mechanisms to further develop the regime, including meetings of States parties, protocols, civil society involvement, timeframes and organization. Essentially it provides a framework agreement, requiring action by States parties to designate an authority (Art. 4.6) – or have the Secretary-General convene an extraordinary meeting if States do not designate one – and
formulate and implement plans for nuclear disarmament. Potential models are the Organisation for the Prohibition of Chemical Weapons (OPCW), the Comprehensive Test Ban Treaty Organisation (CTBTO) and the International Atomic Energy Agency (IAEA). The Model NWC proposes an International Agency similar but not identical in structure to the OPCW, aiming for containment and surveillance of all materials, equipment or facilities that could contribute to the development, production or maintenance of nuclear weapons. In addition to the Conference of States Parties, which would meet annually and in special sessions as necessary, suggested elements are an Executive Council to oversee implementation and operation and a Technical Secretariat to carry out the tasks of implementation and verification.

Membership: The respective memberships of the NPT, TPNW and NWC would appear to support a realist, and discouraging, view of disarmament: the NPT (with its unfulfilled promise of disarmament) is nearly universal, the Ban Treaty (prohibiting nuclear weapons) only has non-nuclear weapon States as signatories at this point, and the Nuclear Weapons Convention (prohibiting and eliminating nuclear weapons) has no member States, despite annual UN General Assembly resolutions calling for such a treaty. In recent years the NPT has faced challenges of compliance and breakout. The Ban Treaty is still awaiting implementation, which is key to future disarmament and will entail complex negotiations. And the NWC by comparison remains a model – an ideal that some see as science fiction.

The Ban Treaty: Transition to a Future Nuclear Disarmament Regime

The TPNW uses IL to promote a future nuclear disarmament regime. Accordingly, the comparison above, between elements of the Model NWC and the TPNW, is more than an exercise in the study of disarmament. It reflects an evolutionary legal and norm-building process that took place over the past two decades – from the concept of a treaty prohibiting and eliminating nuclear weapons (1997) to the reality of a treaty prohibiting nuclear weapons (2017). During the 20 intervening years the political landscape changed in terms of actors, political stances and the relevant regime: civil society initiated both the MNWC and the TPNW, and in the latter case contributed to negotiations; the initially controversial concept of a disarmament treaty became more acceptable, and a treaty actually emerged.

The elements of the treaty that was eventually adopted became conceivable over time to a critical mass of relevant actors, corresponding with one of Howse and Teitel’s measures of the law’s effectiveness, namely, its potential to influence how policymakers view international problems (Howse and Teitel 2010, 130). In retrospect the Model Nuclear Weapons Convention (1997 and 2007 versions) was far more ambitious in many aspects; in fact this was part of its purpose. Moreover, although the TPNW, unsurprisingly, is far more modest, it has many innovations that reflect normative changes and citizen engagement during the past decades: building on IHL to secure the ICJ advisory opinion and launch the process leading to the TPNW, research on disarmament verification, promotion of disarmament education and increased awareness of risks related to nuclear weapons (TPNW Preamble), and the inclusion of incentives for compliance (victim assistance and environmental remediation). The adoption of the TPNW is therefore a manifestation of normativity in action, through a process in which civil society was an increasingly active and influential participant – corresponding with IL’s conception of law as a pluralistic process that incorporates a range of actors and social discourse (Dunoff and Pollack 2012, 21).
The Model NWC, as a UN discussion document, became part of the political and normative landscape before TPNW negotiations commenced, thereby informing the bargaining process as described by Howse and Teitel (2010) and contributing to normativity as described by Dunoff and Pollack (2012). Normativity is also inherent in the TPNW’s reliance on and emergence from IHL. The prevention of potential nuclear devastation accords with the principles and prohibitions of humanitarian law, and unsurprisingly, therefore, this body of law served as both a foundation and a point of departure for a transnational network of individuals, groups, governments and international organizations. Both the NWC and the TPNW derive their legitimacy from international law and particularly humanitarian law, among other sources, and both originated as initiatives that drew deliberately and directly from this body of law.

One means of fostering compliance is to build directly on collective interests, or trade-offs based on competing interests, including through innovative incentives related to the subject matter of a treaty. International legal instruments developed over the past two decades, including the TPNW, reflect this overall development in international law by placing greater emphasis on assistance and cooperation. The TPNW specifically devotes two articles to assistance (to victims and states) and cooperation: Article 6 (Victim assistance and environmental remediation) and Article 7 (International cooperation and assistance), thus offering incentives and mechanisms for compliance.

Like the positivist IL stream, IR depictions of international law-making focus almost exclusively on treaties and formal institutions rather than the process of law-making. The Model NWC, by identifying and exploring the elements of a disarmament regime, challenged resisters and informed supporters during the pre-negotiation and negotiation phases leading to adoption of the TPNW. Likewise, IR analyses tend to overlook the vast range of law-making fora besides official dialogue, as well as the role of non-state actors. Both the Model NWC and TPNW, driven and informed by civil society efforts, incorporated these varied fora and roles, thus also lending credibility to IL perspectives on law-making. On matters of legal interpretation, civil society actors used the 1996 ICJ opinion not only to urge treaty negotiations but also at the domestic level, to delegitimize the reliance on nuclear weapons and reinforce the norm of nuclear disarmament. These are examples of law-making as a pluralistic process, as described by Dunoff and Pollack (2012, 21). Constructivist IL and IR (and overlapping) perspectives offer tools to evaluate the impact over time of the deliberate norm-building effort that yielded the TPNW.

In parallel, the scientific infrastructure for verification has expanded and improved, making the foundation for verification even more solid than it was at the time the Model NWC was launched. Its proposed verification elements have seen progress during the past two decades in terms of research and development, new areas and means of verification, implementation, testing and refinement (for further details see above, Verification and compliance). Thus, although the MNWC is more detailed and technical regarding verification, the TPNW is actually better positioned for verifiable implementation. Both the TPNW and the MNWC complement other existing and proposed legal instruments, including the BWC, CWC, CTBT, NWFZ treaties and a future FMCT, reinforcing the concept of law as an iterative and interactive norm-building process.

As Dunoff and Pollack (2012) observe, both IL and IR are preoccupied with “the causes and consequences of international cooperation” yet they were “estranged for most of the 20th century, and developed along parallel but rarely intersecting paths” (1). After the end of the
Cold War, however, a “vibrant IL/IR literature” began to emerge – but a very asymmetrical one: “Specifically, most IL/IR writings involve the application of IR theories and methods to the study of international legal phenomena, with little or no attention to the potential contribution of international legal scholarship” (1). It is not surprising, therefore, that while efforts to promote disarmament begin with the facts on the ground – that is, “the real world” – the reverse is not true: self-defined realists often dismiss rather than explore the potential contribution of international legal instruments and processes. Our examination of the TPNW and the evolution of the concepts that led to the treaty’s adoption and informed its elements aims to dispel the notion that this treaty – the product of decades of multi-fora norm-building efforts based on a century-old body of law – is merely symbolic. A groundswell of transnational support for disarmament manifested as an international legal instrument, despite the refusal to participate on the part of those who actually hold the “key”. Individuals and entities who prioritize universal over (perceived) national interests achieved concrete results through the very mechanisms and processes of States, governments and international organizations subject to national influence and international political power dynamics.

The Gang of Four and other former military and political leaders (Shultz et al. 2007) who have reassessed the value of nuclear weapons for national security mostly represent a realist perspective. A realist critique of the logic of nuclear deterrence would inevitably expose the fallibility of assuming rationality among nuclear-armed decision makers, and critiques of deterrence theory (or Mutually Assured Destruction) using IR concepts do in fact abound. It is also worth noting that deterrence theory, in turn, reveals a point of weakness in international law, as reflected in the ICJ advisory opinion, which pointedly identified deterrence as an unresolved issue. The court found, however, that the law demands resolution: the remedy to this uncertainty is to negotiate nuclear disarmament. In other words, disarmament under effective verification is the legal answer – the normative remedy – where the law is indeterminate in relation to nuclear weapons.

IL’s focus on law as a normative process corresponds with the emergence over the past two decades of new forms of transnational cooperation and policymaking, including in the area of nuclear disarmament. The new forces at work are often self-driven and self-reflective (they learn from the past; they question their motives and test their tactics) and crosscutting – across nationalities and governmental and private entities and individuals not easily categorized and perhaps unclassifiable. Developments in the area of international law generally over the past two decades, in terms of treaties, process, players and theory, mirror developments in the non-proliferation and disarmament regime specifically, as exemplified most starkly by the adoption of a treaty prohibiting nuclear weapons and laying the foundation for a future regime to eliminate them. The elements of this treaty, as well as the conditions, dynamics and efforts that led to its adoption, reflect trends and changes in the area of international law in response to political reality. In this sense, the dominant academic scholarship has yet to catch up with reality.

The effectiveness of the TPNW in prohibiting nuclear weapons and laying a foundation for a comprehensive disarmament regime is yet to be determined; among other factors it depends on the treaty’s normative impact, particularly among nuclear-armed States, and on future compliance. Towards this end the means of transition from the TPNW to a possible NWC deserve attention. One option would be to negotiate a comprehensive agreement (with prior preparation) after nuclear-armed States join the TPNW, which allows them to join individually without excluding the possibility of some joining at the same time.
Alternatively, such an agreement could be reached and (partially) implemented prior to their joining the TPNW, or negotiated as an additional protocol (Art. 8b of TPNW). Nuclear-armed States party to such a protocol would not necessarily have to be parties to the TPNW, at least not immediately; it could be negotiated independently, with the TPNW serving as a normative framework before they join. Although the complexities of transitioning from the TPNW to a comprehensive disarmament regime are beyond the scope of this paper, we identify these options as potential avenues of exploration.

Conclusions

If the areas of division between IL and IR represent gaps between the ideal and the real, then the NWC could be said to embody the ideal while the NPT represents the real. The Ban Treaty embodies both: it represents the ideal, as it has no nuclear weapon State signatories yet; and it represents the real because it exists – the realistic version of a civil-society driven, state-adopted legal instrument. This is the treaty that is possible in today’s reality, either praised or dismissed as essentially normative in value, depending on the observer. Assessing its value therefore means assessing the value of norms and norm-making processes, as well as the factors and dynamics that led to adoption of the treaty.

Opposing trends and resistance to disarmament are also a reality, but they do not negate the evolution and value of norms. The law can and does coexist in parallel with violations. At the domestic level the argument is trivial: murder is illegal, but it happens; no one would argue that laws against murder therefore have no value. If pursuit of the ideal clashes with the real and adapts its aims, new norms emerge. These norms do not depend only on enforcement as a means of implementation if they are informed by elements such as innovative incentives and collective interests, and they can be evaluated in terms of effectiveness and normativity in addition to compliance.

International law in all its manifestations – instruments, agents, processes and theory – has evolved over the past two decades; within this context, so too has the global non-proliferation and disarmament regime, notwithstanding – indeed, directly in spite of – lack of progress and visible instances of regression in the political sphere. IR theory’s insights about self-interest and power are as relevant for their descriptive value as they were at the end of the Cold War. But since that time two decades have passed during which international legal theory and legal instruments have adapted to changing realities, while realpolitik and other realist perspectives have yet to offer new insights designed to help the international community overcome global threats such as the threat or use of force, including nuclear weapons, in the post-Cold War era. Perhaps the proliferation we have seen in recent years is due, in part, to this shortcoming in the dominant and most influential body of scholarship on which policymakers tend to rely.

The indefinite extension of the NPT was followed immediately by the ICJ advisory opinion and shortly thereafter by calls for an NWC, followed by a first model NWC, which intentionally isolated the question of political will in order to explore the legal and technical aspects of nuclear disarmament. The MNWC helped identify the conditions for nuclear disarmament, as well as the main players and their positions. Its elements were used to provoke discussion and make the concept of a disarmament treaty acceptable. The TPNW, in contrast, highlights the element of political will because it is an actual treaty, with identifiable signatories and non-signatories. In combination, they provide a foundation for a comprehensive and verifiable future nuclear disarmament regime.
The challenges to nuclear disarmament are both direct – proliferation, breakout, non-compliance – and indirect, in the form of lack of progress and lack of political will on the part of key players. The obstacles to disarmament can be at least partially explained in terms of utilitarian state interests and the search for power, but IR theories also tell us to examine perceptions of the national interest. And these are subject to change, as evidenced by the Gang-of-Four statement and comparable declarations by former military and political leaders denouncing the value of nuclear weapons in terms of security at the national and international levels. This shift in conceptualizing and measuring the national interest reflects a normative transition within a largely realist, as opposed to idealist, group.

Even though legal instruments constitute the cornerstone of the current (and proposed future) regime, and despite the use of international legal institutions and courts to pursue disarmament, IR analyses still dominate the literature in this area, at the expense of IL theories. The two are not incompatible, and in fact some IR and IL approaches correlate more closely with one another than with other approaches within the broad categories of the respective theories. Where they are congruent is also where they point to normative law-making based on confidence-building and verification as the way to advance nuclear disarmament, which is compatible with norm-building in constructivist approaches.

In an effort to broaden the scope for scholarly analyses of nuclear disarmament, we have presented a skeletal framework for assessing progress in the area, exploring selective elements of what is a much larger potential endeavour. Further study might use a matrix of regimes across elements and over time, and by cross-referencing perhaps reveal both positive and negative trends. Another set of dimensions might be the legal, technical and real-world developments over time, considering that legal and technological progress in the area of disarmament has responded to real-world developments during recent decades. Such a matrix could then help identify where the foundation and infrastructure for nuclear disarmament need reinforcement.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Notes on Contributors

Merav Datan is an international lawyer. Her former positions include consultant to the UN Department for Disarmament Affairs, adjunct professor at Rutgers Law School, and UN representative for various disarmament NGOs. She was the principal drafter of the Model Nuclear Weapons Convention.

Jürgen Scheffran is professor in geography at the University of Hamburg and head of the Research Group Climate Change and Security (CLISEC) at the Center for Earth System Research and Sustainability. He had positions at the University of Marburg, Technical University of Darmstadt, University of Illinois and the Potsdam Institute for Climate Impact Research. He was one of the drafters of the Model Nuclear Weapons Convention.

ORCID

Jürgen Scheffran http://orcid.org/0000-0002-7171-3062
References

Brownlie, I. 1963. *International Law and the Use of Force by States*. Oxford: Clarendon Press.

Burroughs, J. 2017. “Key Issues in Negotiations for a Nuclear Weapons Prohibition Treaty.” *Arms Control Today* 47 (5): 6–13.

Dalton, T., W. Hoffman, A. Levine, L. Bin, G. Perkovich, and T. Zhao. 2017. *Toward a Nuclear Firewall: Bridging the NPT’s Three Pillars*. Washington, DC: Carnegie Endowment for International Peace.

Datan, M. 2003. “Nuclear Norms: Prohibition, Positivism, and Realism.” In *Chap. 7 In Reframing the Agenda: The Impact of NGO and Middle Power Cooperation in International Security Policy*, edited by K. R. Rutherford, S. Brem, and R. A. Matthew, 143–174. Westport, CT: Praeger.

Datan, M., F. Hill, J. Scheffran, A. Ware, M. Kalinowski, and V. Sidel. 2007. *Securing Our Survival. The Case for a Nuclear Weapons Convention*. Cambridge, MA: IPPNW, IALANA, INESAP.

Datan, M., A. Ware, M. Kalinowski, J. Scheffran, V. Sidel, and J. Burroughs. 1999. *Security and Survival. The Case for a Nuclear Weapons Convention*. Cambridge, MA: IPPNW, IALANA, INESAP.

Dunoff, J. L., and M. A. Pollack. 2012. “What Can International Relations Learn from International Law?” *Legal Studies Research Paper No. 2012-14*, Temple University Beasley School of Law.

Feiveson, H., Z. Mian, A. Glaser, and F. von Hippel. 2014. *Unmaking the Bomb: A Fissile Material Approach to Nuclear Disarmament and Nonproliferation*. Cambridge, MA: MIT Press.

Franck, T. 1970. “Who Killed Article 2(4)? Or: Changing Norms Governing the Use of Force by States.” *American Journal of International Law* 64 (4): 809–837.

Howse, R., and R. Teitel. 2010. “Beyond Compliance: Why International Law Really Matters.” *Global Policy* 1 (2): 127–136.

INESAP. 1995. “Beyond the NPT – A Nuclear-Weapon-Free World.” Report prepared on the occasion of the 1995 NPT Review and Extension Conference, New York/Darmstadt: International Network of Engineers and Scientists Against Proliferation. International Court of Justice (ICJ). 1996. *Legality of the Threat or Use of Nuclear Weapons*. Advisory opinion, 8 July, The Hague: International Court of Justice.

Kalinowski, M. B., W. Liebert, and J. Scheffran. 2000. “Beyond Technical Verification: Transparency, Verification, and Preventive Control for the Nuclear Weapons Convention.” In *Global Elimination of Nuclear Weapons*, edited by M. B. Kalinowski, 61–68. Baden-Baden: Nomos.

Meier, O., S. Cordes, and E. Suh. 2017. “What Participants in a Nuclear Weapons Ban Treaty (Do Not) Want.” *Bulletin of the Atomic Scientists*, June 9. [https://thebulletin.org/2017/06/what-participants-in-a-nuclear-weapons-ban-treaty-do-not-want](https://thebulletin.org/2017/06/what-participants-in-a-nuclear-weapons-ban-treaty-do-not-want).

Mian, Z., T. Patton, and A. Glaser. 2017. “Addressing Verification in the Nuclear Ban Treaty.” *Arms Control Today* 47 (5): 14–22.

Model Nuclear Weapons Convention. 2007. Published in Datan et al., *Securing Our Survival*, and submitted by Costa Rica as a Working Paper to the UN. [https://daccess-ods.un.org/TMP/5818312.16812134.html](https://daccess-ods.un.org/TMP/5818312.16812134.html).

Schachter, O. 1984. “The Right of States to Use Armed Force.” *Michigan Law Review* 82 (5/6): 1620–1646.

Scheffran, J. 2018. “Verification and Security of Transformation to a Nuclear-Weapon-Free World: The Framework of the Treaty on the Prohibition of Nuclear Weapons.” *Global Change Peace & Security* 30 (2): 1–20.

Scheffran, J., and M. Datan. 1997. “Nuclear Weapons Convention – The Treaty is Out of the Bottle.” *AGNI* 3 (1): 47–63.

Shultz, G. P., W. J. Perry, H. A. Kissinger, and S. Nunn. 2007. “A World Free of Nuclear Weapons.” *The Wall Street Journal*, Jan 4.

UN General Assembly (UNGA). 2017. *Taking Forward Multilateral Nuclear Disarmament Negotiations*. (UNGA, A/RES/71/258, 11 January 2017), New York: United Nations.

United Nations Office for Disarmament Affairs (UNODA). 2008. *The Secretary-General’s Five Point Proposal on Nuclear Disarmament – “The United Nations and Security in a Nuclear-Weapon-Free World.”* October 24, New York: United Nations.

Van Wyk, J.-A., L. Kinghorn, H. Hepburn, C. Payne, and C. Sham. 2007. “The International Politics of Nuclear Weapons. A Constructivist Analysis.” *Scientia Militaria, South African Journal of Military Studies* 35 (1): 23–44.