Complex Deterrence Theory and the Post-Cold War Security Environment*

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Abstract

After the Cold War, traditional deterrence theory has come under criticism from a number of perspectives, including the reduced value of deterrence accompanying the disappearance of conflicts between major powers, and the ineffectiveness of deterrence in dealing with regional adversaries and radical international terrorist organizations. Complex deterrence theory considers not only the nuclear weapons-based dyadic deterrence of the Cold War era but also the complicated deterrence relationships that encompass countries suspected of developing nuclear weapons such as North Korea and Iran, as well as non-state actors such as international terrorist organizations. This theory also examines the use of various military technologies other than nuclear weapons, as well as nonmilitary means, in deterrence. Although the theory has yet to be systemized to the same extent as Cold War nuclear deterrence theory, it nonetheless incorporates beneficial perspectives from which to analyze the post-Cold War security environment.

Introduction

The applicability of the concept of deterrence that occupied the dominant position in security theories and policy frameworks during the Cold War to the various international events that have occurred since the Cold War ended has been called into question and been the target of criticism. Successive arguments have been put forward claiming that the value of deterrence has decreased considerably as conflicts between major powers have disappeared, or raising doubts about the usefulness of deterrence in dealing with regional adversaries intent on developing and owning weapons of mass destruction (nuclear, chemical and biological weapons) and radical international terrorist groups. Above all, the debate surrounding how nuclear weapons should be treated in America's deterrence policy stands out as an example that symbolizes the current skepticism concerning deterrence.[1]

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1 T. V. Paul, "Complex Deterrence: An Introduction," T. V. Paul, Patrick M. Morgan, and James J. Wirtz, eds., *Complex Deterrence: Strategy in the Global Age* (Chicago: University of Chicago Press, 2009), p.1. For example, the Cold War deterrence concept has been criticized as invalid because the leaders of post-Cold War regional adversaries do not necessarily judge potential gains or losses rationally, meaning not only that nuclear weapons cannot be counted on as a certain deterrent, but that there is even the danger that if those adversaries gain possession of nuclear weapons themselves, America will conversely be held in check, despite being superior militarily. Keith B. Payne, "The Fallacies of Cold War Deterrence and a New Direction," *Comparative Strategy*, vol.22, no.5 (December 2003), pp.421-422; Avery Goldstein, *Deterrence and Security in the 21st Century:*

The deterrence concept during the Cold War was formed around the nuclear weapons-based deterrence dyad of America and the Soviet Union. If America and Russia undertook significant nuclear disarmament following the Cold War, the relative importance of the number of nuclear weapons held by other nuclear weapon states would increase, and deterrence would become a complicated, multinational activity.[2] Furthermore, if the deterrence implications of conventional weapons increase as a result of advances in weapons technologies, it will not be possible to apply the nuclear-centric Cold War deterrence concept as it stands. Moreover, it is being pointed out that from the outset deterrence may prove ineffective in dealing with threats such as terrorist attacks by non-state actors that do not have territories or citizens to protect like sovereign states do, or cyber-attacks, where identifying the attackers is difficult. On the other hand, some argue that nuclear deterrence remains important in the post-Cold War era.[3] Attempts to explore new, post-Cold War deterrence concepts based on these debates continue today, and one such initiative is the complex deterrence theory discussed in this article.

Complex deterrence theory considers not only the nuclear weapons-based dyadic deterrence of the Cold War era but also the complicated deterrence relationships that encompass countries suspected of developing nuclear weapons such as North Korea and Iran, as well as non-state actors such as international terrorist organizations. It also examines the use of various military technologies other than nuclear weapons, as well as nonmilitary means, in deterrence. Although this complex deterrence theory is of course not systemized to the same extent as Cold War nuclear deterrence theory, it conceivably incorporates beneficial perspectives from which to analyze the post-Cold War security environment.

This article begins by explaining the concept of complex deterrence and its history. Next, it considers the positioning of nuclear weapons in complex deterrence by compartmentalizing that positioning as basic deterrence and extended deterrence. Lastly, it explores what kinds of implications complex deterrence has for deterrence relationships in the Asia-Pacific region.

1. The concept of complex deterrence

(1) The transformation of deterrence relationships and "general deterrence"

Deterrence is considered to be the role that military force plays in displaying a stance of taking a military response and inflicting damage in the event that the other party should attack, and in doing so, forcing the other party to desist from carrying out the attack itself. Of the deterrence concept categories, deterrence by punishment (or retaliation) involves issuing the threat of a retaliatory strike that cannot be endured, and on that basis, urging the other party to calculate the costs, thus making it renounce an attack. Deterrence by denial meanwhile involves having the capacity

China, Britain, France, and the Enduring Legacy of the Nuclear Revolution (Stanford: Stanford University Press, 2000), pp.52-54. In addition, a 1995 RAND Corporation report also pointed out that these Third World leaders show a strong tendency for tolerating risks in their external activities, and that this may make nuclear deterrence difficult for America. Dean Wilkening and Kenneth Watman, *Nuclear Deterrence in a Regional Context* (Santa Monica: RAND, 1995), pp.11-12, http://www.rand.org/content/dam/rand/pubs/monograph_reports/2006/MR500.pdf. This and subsequent URLs were all accessed on July 29, 2016.

2 James M. Acton, *Deterrence During Disarmament: Deep Nuclear Reductions and International Security* (Abington: Routledge for the International Institute for Strategic Studies, 2011), pp.83-84.

3 Giorgio Bertolin, "To What Extent is Nuclear Deterrence Important in the Post-Cold War World?" *E-International Relations*, June 4, 2013, http://www.e-ir.info/2013/06/04/to-what-extent-is-nuclear-deterrence-important-in-the-post-cold-war-world/.

to physically thwart a specific aggressive behavior, and on that basis, urging the other party to calculate its ability to achieve its goals, thus making it renounce an attack.[4]

In deterrence, the employment of military force is essentially a threat, and the goal is to not reach the point of actually exercising that force.[5] Patrick M. Morgan states that deterrence is a concept that had been practiced in international politics from long ago, but interest in it increased rapidly from the onset of the Cold War. According to Morgan, the Cold War deterrence theory that centered on the bilateral relationship between America and the Soviet Union was premised on the following six elements.[6]

(1) Severe conflict
Both the deterring country and the other party maintain immediate attack preparedness at all times and both have a clear motivation to launch a preemptive strike (=start a war) if there is a chance of success
(2) Rationality
Preservation of rational judgment, whereby both countries in the hostile relationship undertake a comparative calculation of the costs and benefits of the attack option, and abandon launching an attack if the costs are higher
(3) Retaliatory threat
Awareness that the country launching an attack will itself be forced to pay costs as a result of retaliation (the effectiveness of this threat is to a large extent attributable to nuclear weapons)
(4) Unacceptable damage
Awareness that the destruction wrought by nuclear weapons will cause a level of damage that will make it impossible to exist as a state
(5) Credibility
Maintaining a deterrence posture in order to make the other party believe the feasibility of the threat being carried out, and effectively communicating this to the other party
(6) Stability
Steps to prevent one's retaliatory deterrence posture from destabilizing deterrence by inciting the other party to a preemptive strike

In a work Morgan wrote in 1977, he utilized the concept of immediate deterrence to analyze deterrence between America and the Soviet Union in times of crises. Immediate deterrence refers to a case in which at least one of two adversarial countries is seriously considering using military force against the other, and the other party attempts to deter that by threatening to use military force to defend itself or to retaliate. Morgan also proposed the idea of general deterrence as a contrasting concept to immediate deterrence. He defined general deterrence as the deterrence relationship that exists in a situation when either or both the deterring country and the opposing country would consider using military force if the opportunity arose, but an attack is not yet a serious, near-term

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4 Commentary in Ministry of Defense, *Defense of Japan 2010* (Tokyo: Gyōsei, 2010), p.263.

5 Kosaburo Nakashima, "Anzenhoshō ni okeru Kyōi Ninshiki no Sōi: Dorama Riron ni yoru Aratana Kokusai Taiō Koarishon" [Difference of Threat Recognition in National Security: Coalition for New International Response by Drama Theory], Yokohama National University Depository, vol.15, no.3 (September 2010), p.67, http://kamome.lib.ynu.ac.jp/dspace/bitstream/10131/7317/1/5-Nakashima.pdf.

6 Patrick M. Morgan, *Deterrence Now* (Cambridge: Cambridge University Press, 2003), pp.1-22.

possibility.[7]

In post-Cold War security research, there has been less interest in deterrence among academics compared to the Cold War period.[8] Morgan argues this is because relationships between or among major powers in the post-Cold War era are no longer based on severe conflicts such as the one that existed between America and the Soviet Union during the Cold War. Even in the relationship between America and China, which is currently regarded as having the highest possibility of causing a severe conflict, there is not much possibility of war breaking out in the foreseeable future. In international relations such as this, deterrence recedes into the background and no longer occupies the central position in international security that it did in the Cold War era.[9] This is precisely the type of deterrence relationship that Morgan referred to as general deterrence, and it represents a characteristic concept that explains the deterrence relationships between or among major powers in the complex deterrence discussed in the next section.

In research on deterrence theory up to now, empirically clarifying if general deterrence is actually functioning has been viewed as extremely difficult compared to immediate deterrence. Lawrence Freedman cited two reasons for that: (1) general deterrence lasts for a relatively long period of time; and (2) it is difficult to separate and analyze the moments of deterrence from their wider political and historical contexts. Where (1) is concerned, to investigate the causes and effects of general deterrence it is necessary to broadly understand the independent factors at work on both the deterring country and the deterred country over a long period. Furthermore, the interaction of the two countries must also be taken into consideration. Where (2) is concerned, although the moments of deterrence conceivably equate to the duration where the military threat the deterring country is issuing prevents the deterred country from attacking, it is not obvious at which point there is a clear distinction between the deterring country and the deterred country within the flow of political and historical events, and neither is it obvious whether the political leaders of the two sides even recognize which position their own country occupies.[10]

General deterrence is thus a complicated and vague concept, and difficult to analyze using Cold War era deterrence theory where the principal subject of analysis was an immediate deterrence situation. The reason for this is that general deterrence, by definition, does not envision its actors as entities posing a military threat with the clear intent or capacity to attack like the Soviet Union in the Cold War era, so conceivably in the context of general deterrence, the threats used for deterrence will also be issued vaguely and suggestively. The coverage of general deterrence is not limited to one actor, and it also includes actors that may not necessarily make rational judgments.[11] As a result, Keith Payne suggests that a deterrence policy should be tailored to each specific case of deterrence depending on the targeted actors.[12]

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7 Patrick M. Morgan, *Deterrence: A Conceptual Analysis* (Beverly Hills: Sage Publications, 1977), pp.28, 31-43.

8 Terence Roehrig, *From Deterrence to Engagement: The U.S. Defense Commitment to South Korea* (Lanham: Lexington Books, 2007), p.2.

9 Morgan, *Deterrence Now*, p.242.

10 Lawrence Freedman, *Deterrence* (Cambridge: Polity Press, 2004), pp.40-46.

11 Morgan, *Deterrence Now*, p.80.

12 Keith B. Payne, *Deterrence in the Second Nuclear Age* (Lexington: University Press of Kentucky, 1996), pp.121-127.

(2) The diversification of threats, and complex deterrence

In the wake of the simultaneous terrorist attacks in America on September 11, 2001 (9/11), the threat posed by non-state actors in international security came to be emphasized. Accompanying this, debate relating to deterrence began to look mainly at its usefulness. Since 9/11, it has frequently been argued that deterrence is no longer useful.[13] Others are conversely of the view that deterrence is indeed still useful.[14] Additionally, given the catastrophic impact should the nuclear deterrent fail and trigger a nuclear war, it has also been argued that it is not enough for the nuclear deterrent to simply be useful – it has to provide deterrence at an almost "complete" level.[15]

Accompanying this diversification of threats to international security triggered by 9/11, interest in deterrence increased once again. Jeffrey W. Knopf points out that the ability to deter asymmetric threats such as terrorism by non-state actors has become the point at issue in debate surrounding deterrence since 9/11, and traditional deterrence concepts and methods have come to be perceived more broadly.[16] However, it is also being said that although a great deal of Cold War deterrence research and policy research exists, not enough progress is being made with theoretical studies on post-Cold War deterrence.[17] On the other hand, in 2007 former United States Secretary of State George Shultz and others published a collaborative article titled "A World Free of Nuclear Weapons" in which they raised questions about the traditional approach to deterrence, with its reliance on nuclear weapons.[18] The complex deterrence theory that is the theme of this article was proposed amid this increasingly active debate surrounding post-Cold War deterrence.

T.V. Paul, one of the editors of *Complex Deterrence*, which was published in 2009, defined the concept of complex deterrence in the following way:

> "An ambiguous deterrence relationship, which is caused by fluid structural elements of the international system to the extent that the nature and type of actors, their power relationships, and their motives become unclear, making it difficult to mount and signal credible deterrence threats in accordance with the established precepts of deterrence theory."[19]

In other words, the issue that complex deterrence theory recognizes is that the credibility of the deterrence threat has been increasingly compromised due to the ambiguity and fluidity of

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13 A R. Knott, "Does 9/11 Mark the End of Deterrence and the Birth of 'Detercion'?" *Defence Studies*, vol.4, no.1 (Spring 2004), pp.40-63. It was also argued that terrorism had brought about the demise of nuclear deterrence. Sharif Shuja, "Nuclear weapons: Terrorism marks the end of deterrence," *News Weekly*, July 17, 2004, http://newsweekly.com.au/article.php?id=1735.

14 Norton A. Schwartz, General, "The Air Force's Enduring Legacy of Nuclear Deterrence," *Air Power History*, vol.56, no.1 (Spring 2009), pp.4-19.

15 Ward Wilson, "Part II: Continuing to Question the Reliability of Nuclear Deterrence," *The Nonproliferation Review*, vol.19, no.1 (March 2012), pp.69-74.

16 Jeffrey W. Knopf, "The Fourth Wave in Deterrence Research," *Contemporary Security Policy*, vol.31, no.1 (April 2010), pp.1-3.

17 Peter Hayes and Richard Tanter, "Beyond the Nuclear Umbrella: Re-thinking the Theory and Practice of Extended Nuclear Deterrence in East Asia and the Pacific," *Nautilus Peace and Security (NAPSNet) Special Report*, May 3, 2011, http://nautilus.org/napsnet/napsnet-special-reports/beyond-the-nuclear-umbrella-re-thinking-the-theory-and-practice-of-nuclear-extended-deterrence-in-east-asia-and-the-pacific/.

18 George P. Schultz, William J. Perry, Henry A. Kissinger and Sam Nunn, "A World Free of Nuclear Weapons," *The Wall Street Journal*, January 4, 2007, http://www.wsj.com/articles/SB116787515251566636.

19 Paul, "Complex Deterrence," p.8.

the international system.[20] As a similar perspective to this, it is being pointed out that the growing complexity of international nuclear order has played a part in exacerbating the uncertainty of nuclear deterrence.[21]

Paul presents five ideal types of relationship between the actors in a complex deterrence situation: (1) deterrence among great powers; (2) deterrence among new nuclear states; (3) basic and extended deterrence involving nuclear great powers and regional powers armed with nuclear, chemical and biological weapons; (4) deterrence between nuclear weapon states and non-state actors; and (5) deterrence by collective actors. (1) is the deterrence relationship of the five nuclear weapon states (America, the United Kingdom (U.K.), France, China and Russia) plus India, and this is viewed as a stable general deterrence arrangement here. (2) is chiefly considered to be the deterrence relationship that exists between India and Pakistan, where nuclear deterrence is functioning although unstable. (3) represents relationships such as America's relationships with Iraq and Iran, and the relationship between Israel and the Arab states, where deterrence is considered to be made complicated due to asymmetric power relationships. (4) argues that the relationships between America and international terrorist organization Al Qaeda and between Russia and Chechen armed insurgents, for example, are fueling greater deterrence complexity. (5) considers the complexity of the deterrence arising from the United Nations, alliances (NATO etc.) or groups of states such as Coalition of the Willing. Issues such as self-deterrence by nuclear weapon states as well as the diversification of deterrence methods resulting from the advancement of military technologies are also said to have contributed to the promotion of the complex deterrence situation.[22]

The next section sorts through the impacts that changes in the international system following the Cold War have had on deterrence, based on the arguments put forward by James J. Wirtz.[23]

(3) The international system after the Cold War and complex deterrence

i) The asymmetry of power and the complexity of deterrence

In the international system that followed the Cold War, America remained as the sole superpower in possession of overwhelming power, resulting in a striking asymmetry of power with other nations. On the other hand, this power asymmetry made deterrence more complicated. Theoretically, threats issued by America, with its massive nuclear capabilities and conventional military force, should be highly credible in terms of restraining regional adversaries that only possess small quantities of weapons of mass destruction. However, since the end of the Cold War militarily-weak adversaries have again and again been successful in deterring America.[24]

Emanuel Adler reasons that the asymmetrical power relationship between or among actors in the international political arena following the Cold War has given rise to the so-called deterrence

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20 Hayes and Tanter, "Beyond the Nuclear Umbrella."

21 House of Commons Defence Committee, *Deterrence in the twenty-first century: Eleventh Report of Session 2013-14, Volume II* (London: Stationery Office, 2014), p.Ev w32, http://www.publications.parliament.uk/pa/cm201314/cmselect/cmdfence/1066/1066vw.pdf.

22 Paul, "Complex Deterrence," pp.9-23.

23 James J. Wirtz, "Conclusions," *Complex Deterrence*, pp.322-328.

24 Ibid., pp.322-323. The outbreak of the Bosnia-Herzegovina conflict in 1992 and the Rwanda genocide of 1994 can be cited as examples of this. Ivan Arreguin-Toft, "Unconventional Deterrence: How the Weak Deter the Strong," ibid., p.214.

trap. A deterrence trap refers to a situation in which a major power is unable to deter the actions of a relatively weaker actor no matter whether the major power threatens the weaker actor with retaliation or abstains from threatening and appeases the weaker actor. For example, even if America threatens to use force in order to deter Iran from nuclear development, there is a possibility Iran will turn America's threat against it in order to fortify its position on its nuclear development plan. And Adler points out that if America restrains itself from threatening Iran and permits Iran to have nuclear weapons, America will then have to deal with the more troublesome problem of how to deter the nuclear-capable Iran from using those nuclear weapons.[25]

ii) Non-traditional actors and the difficulties of deterrence

As it is widely known, after the Cold War the actors making up the international system came to include non-traditional actors such as international NGOs and international and domestic terrorist organizations, not just traditional sovereign states. Furthermore, the domestic and foreign "audiences" for these actors' activities are themselves becoming actors too. The advance of globalization and the development of information technology such as the Internet have made it possible for people to directly express their opinions on international events, giving rise to a situation that policy-decision makers cannot ignore either. Along with this development, the relationship between traditional states and these non-traditional actors is making deterrence difficult to enforce.[26]

Taking deterrence on states as an analogy, in order to deter attacks by a terrorist organization it is necessary to issue a credible threat that sufficiently threatens its survival. As the assets that a terrorist organization relies on for its survival, Yair Naveh of the Israel Defense Forces cites (1) the organization's leadership strata and commander; (2) its military capability for carrying out terrorist attacks; (3) its economic and financial support base; and (4) the network of alliances with other organizations and states that provide support in the form of arms and financing. It is possible to achieve deterrence by demonstrating the will to use military force to inflict damage on these assets, Naveh says.[27] Of the assets, it has been pointed out for some time that (3) and (4) are made possible by states that support terrorism. More recently, however, it is probably necessary to take a wider definition of "support" into account, including the support provided by the audiences mentioned above. These audiences include the citizens of the deterring countries.

Citing Israel's retaliatory attack against Hezbollah in 2006 as an example, Adler argues that although Israel's use of military force was aimed at deterring any further terrorist attacks from Hezbollah, it instead resulted in a bolstering of Hezbollah's international standing, thus putting Israel in a deterrence trap.[28] The presence of an audience for the activities of the non-traditional actor (in this case Hezbollah) is believed to have played a part in this development.

Furthermore, in some instances, terrorist organizations utilize the Internet to threaten

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25 Emanuel Adler, "Complex Deterrence in the Asymmetric-Warfare Era," *Complex Deterrence*, pp.99-101. Refer to the following with regard to deterrence in a case where Iran attained nuclear capability. Peter Jones, "Learning to Live with a Nuclear Iran," *The Nonproliferation Review*, vol.19, no.2 (June 2012), pp.197-217.

26 Wirtz, "Conclusions," p.324.

27 Yair Naveh, "Deterrence against Non-State Actors: Thoughts following Operation Protective Edge," *The Institute for National Security Studies (INSS) Insight*, no. 663, February 11, 2015, http://www.inss.org.il/index.aspx?id=4538&articleid=8720.

28 Adler, "Complex Deterrence in the Asymmetric-Warfare Era," p.100.

deterring countries through these audiences. So-called Islamic State (IS) issues large volumes of threatening statements and images online that are directed at America. It is aiming to make Americans feel terrified and war-weary, and in doing so deter America from intervening in the territories IS controls in Iraq.[29]

iii) The recession into the background of deterrence in relationships between or among major powers

The changed nature of the international system that arose following the Cold War and the advance of globalization in the international political economy arena resulted in major countries avoiding political and military confrontations. A consequence of this was that deterrence receded into the background. Much of America and Russia's strategic nuclear arsenals was taken off alert, and the two countries have substantially reduced their nuclear capacities as a result of the various arms control and disarmament talks held between them. The U.K. and France have also voluntarily moved to curtail their nuclear warheads, and are refraining from developing and producing new nuclear weapons. Morgan and Paul describe this deterrence relationship between or among major powers as "recessed general deterrence."[30]

This situation is beneficial to improving the international security environment on the one hand, but it has also played a part in undermining the credibility of America's extended deterrence. Russia's annexation of Ukraine's Autonomous Republic of Crimea in March 2014 sparked a debate that raised questions about America's determination toward extended deterrence.[31] Some were of the opinion that America's reluctance to make a military response to this problem suggested it might even hesitate to use military force to protect its allies in the future.[32]

2. The positioning of nuclear weapons in complex deterrence

(1) Basic deterrence

As stated in the previous section, because severe conflict disappeared as an undertone in relations between or among major powers following the Cold War, nuclear weapons ceased to be at the forefront of basic deterrence between major powers, and receded into the background. While this trend has not necessarily reached the point of coming together as a deterrence theory that does not rely on nuclear weapons at all, it can be said to be contributing to a reduction in the scale of the nuclear weapons required for deterrence. Vipin Narang points out that compared to Cold War deterrence, when the prevailing theory was that as many nuclear weapons as possible were needed to achieve deterrence, following the Cold War there was a shift in view, with the belief that deterrence is attainable with minimal nuclear weapons.[33]

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29 Rita Katz, "The Islamic State's Borderless War," August 11, 2014, http://news.siteintelgroup.com/blog/index.php/entry/224-the-islamic-state%E2%80%99s-borderless-war.

30 Morgan and Paul, "Deterrence among Great Powers in an Era of Globalization," *Complex Deterrence*, pp.259, 263-264.

31 "The decline of deterrence: America is no longer as alarming to its foes or reassuring to its friends," *The Economist*, May 3, 2014, pp.31-34.

32 Gary Sands, "Dragon v. Godzilla: How Far will the U.S. go to Reassure Japan?" *International Policy Digest*, April 26, 2014, http://www.internationalpolicydigest.org/2014/04/26/dragon-v-godzilla-far-will-u-s-go-reassure-japan/.

33 Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton: Princeton University Press, 2014), pp.5-7.

This line of thinking is clearly demonstrated in the U.K.'s basic deterrence posture. The U.K. possesses the minimum strategic nuclear weapons system, comprising four strategic nuclear submarines equipped with American-made Trident II SLBMs, and assigns one of the four submarines to maritime patrol duties at all times, a posture known as Continuous At-Sea Deterrent (CASD). In CASD the immediate response posture for launching missiles has been relaxed to a level requiring several days, and the missiles are not aimed at any specific targets. Incidentally, a decision on updating the Trident system was made in July 2016, and the debate on the update within the U.K. has reflected the complex deterrence situation. Namely, given the changed nature of the security environment after the Cold War, the point at issue in this debate is whether or not the U.K. still needs to maintain a nuclear deterrent force into the future.[34]

Both Russia and America continue to keep a considerable number of strategic nuclear weapons on high alert. The Nuclear Posture Review of 2010 (2010 NPR) states that America keeps nearly all its ICBMs on alert and maintains a significant number of SSBNs at sea at any given time.[35] Russia is understood to be adopting a similar readiness, and it is being pointed out that in order to make it possible to reduce the number of strategic nuclear weapons that America and Russia have on alert, the two countries' bilateral relationship will need to change in such a way that the role of nuclear weapons retreats further into the background.[36] America-Russia relations deteriorated as a result of the Ukraine crisis, however, Russia's new military doctrine, revised in December 2014, still positions strategic nuclear weapons as an "important factor" for deterring disputes.[37]

On the other hand, from the standpoint of complex deterrence, it is worth noting that in the abovementioned military doctrine Russia advocates the idea of a "non-nuclear deterrence system." Since this system of non-nuclear deterrence is defined as "a complex of foreign policy, military and military-technological measures aimed at preventing aggression against the Russian Federation through non-nuclear means" it is clearly positioned as basic deterrence that does not rely on nuclear weapons. Forming the backdrop to this concept is Russia's awareness in recent years of the threat of the West using high-tech military force to exert pressure externally while utilizing non-military means such as politics, economics, and information to stir up "citizens' potential for protest" and overturn the state regime. As this threat cannot be deterred with the traditional nuclear deterrence, Russia came

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34 Satomi Kyuko, "Eikoku no Kakuseisaku wo meguru Keii to Giron: Toraidento Kōshin wo Chūshin ni" [The Background and Discussion Surrounding the U.K.'s Nuclear policy: Centering on the Trident Upgrade], *Reference,* November 2011, pp.93-113, http://www.ndl.go.jp/jp/diet/publication/refer/pdf/073005.pdf. Ministry of Defence, "The UK decides to renew continuous at sea deterrent," July 19, 2016, https://www.gov.uk/government/news/the-uk-decides-to-renew-continuous-at-sea-deterrent.

35 U.S. Department of Defense (DoD), *Nuclear Posture Review Report*, April 2010, p.25, http://www.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf.

36 Hirofumi Tosaki, "Senryaku Kakuheiki Sakugen ni muketa Kadai: Keikai Taisei no Teigen, Misairu Bōei no Suishin" [Challenges to Reducing Strategic Nuclear Weapons: Reducing the Alert Level and Promoting Missile Defense], The Japan Institute of International Affairs (JIIA) Center for the Promotion of Disarmament and Non-Proliferation, *Shin START Go no Gunshuku Kadai: Nihon ni totte no Imiai no Kentō [The Challenges of Arms Reduction After the New START: The Implications of the Review for Japan]*, fiscal 2011 commissioned research, Ministry of Foreign Affairs of Japan (MOFA), March 2012, pp.34, 37, http://www.cpdnp.jp/pdf/003-01-012.pdf.

37 Yu Koizumi, "Roshia ga Gunji Dokutorin wo Kaitei: Haiburiddo Sensō to Kagekishugi Tero e no Shisen" [Russia Revises its Military Doctrine: Looking at Hybrid Wars and Extremist Terrorism], December 27, 2014, *World Security Intelligence (WSI) Commentary*, vol.1, no.6 (December 2014), http://wsintell.org/top/2014/12/russia-new-military-doctrine.

to think that it needs to possess a complex deterrent that includes not only military force but also non-military means. The annexation of the Crimean Peninsula in the Ukraine crisis or the dispute in Eastern Ukraine could also be described as cases of Russia itself personifying the very threat that it fears.[38] Where misgivings about Iran's nuclear development are concerned, there is research that claims Iran is pursuing basic deterrence through "nuclear hedging." Wyn Bowen and Matthew Moran argue that Iran's behavior should not be viewed in a conventional binary acquisition/restraint framework. Rather, it should be seen as an attempt by Iran to retain the latent ability to develop nuclear weapons, enabling it to become nuclear-capable in a relatively short time.[39] Bowen and Moran's assertion conceivably flows on from the virtual nuclear arsenals concept[40] that was advocated in the 1980s in the final stages of the Cold War, and it has important ramifications from the perspective of complex deterrence also. That is because if as they point out, Iran continues to maintain the minimum nuclear weapons development capacity such as uranium enrichment technology, then Saudi Arabia and other neighbors that harbor concerns about Iran will likely seek to obtain a similar capacity, triggering a nuclear hedging "cascade" and complicating deterrence relationships in the Middle East.[41]

Where cyber-attacks are concerned, the threat posed not only by states but also by non-state actors with cyber-attack capabilities has been growing in recent years, leading to debate about how to implement cyber deterrence. Achieving cyber deterrence based on traditional deterrence theories is difficult, and deterrence by retaliation, in particular, has been thought of as unworkable. However, recently cyber deterrent forces are being established, including ones that identify the sources of cyber-attacks and threaten to retaliate against such attacks. There is even talk that nuclear weapons should be used as a means of retaliation.[42] Elbridge Colby argues that for (retaliating against) grave cyber-attacks that directly threaten the lives of citizens, using nuclear weapons should not be ruled out as an option.[43] In response to this, some have suggested that threatening to use nuclear weapons to retaliate against cyber-attacks would lack credibility in adversaries' eyes, and so would not work as a deterrent.[44]

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38 Ibid.

39 Wyn Bowen and Matthew Moran, "Living with nuclear hedging: the implications of Iran's nuclear strategy," *International Affairs*, vol.91, no.4 (July 2015), pp.687-707, http://www.chathamhouse.org/sites/files/chathamhouse/field/field_document/INTA91_4_01_BowenMoran.pdf. Ariel E. Levite defines "nuclear hedging" as "a national strategy of maintaining, or at least appearing to maintain, a viable option for the relatively rapid acquisition of nuclear weapons, based on an indigenous technical capacity to produce them within a relatively short time frame ranging from several weeks to a few years." Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security*, vol.27, no.3 (Winter 2002/03), p.69.

40 Sukeyuki Ichimasa, "Kasōteki Kakusenryoku Gainen to 'Kakuheiki no nai Sekai'" [The Concept of Virtual Nuclear Arsenals and a World without Nuclear Weapons], *NIDS Journal of Defense and Security*, vol.14, no.1 (December 2011), pp.23-38.

41 Bowen and Moran, "Living with nuclear hedging," pp.693-701.

42 Takahisa Kawaguchi, "Saibā Kūkan ni okeru Anzenhoshō no Genjō to Kadai: Saibā Kūkan no Yokushiryoku to Nichibei Dōmei" [The Current State of Security in Cyberspace, and the Challenges: Cyberspace deterrence and the Japan-U.S. Alliance], JIIA, *Rising Challenges for the Japan-U.S. Alliance in the Global Commons (Cyberspace, Outer Space, and the Arctic Ocean)*, Research Report on MOFA's fiscal 2013 Diplomacy / Security Investigation and Research Projects, March 2014, pp.11-26, http://www2.jiia.or.jp/pdf/resarch/H25_Global_Commons/10-Rising_Challenges_for_the_Japan-US_Alliance_in_the_Global_Commons.pdf.

43 Elbridge Colby, "Cyberwar and the Nuclear Option," *The National Interest*, June 24, 2013, http://nationalinterest.org/commentary/cyberwar-the-nuclear-option-8638.

44 Timothy Farnsworth, "Is There A Place For Nuclear Deterrence in Cyberspace?" *Arms Control Now*, May 30, 2013, http://armscontrolnow.org/2013/05/30/is-there-a-place-for-nuclear-deterrence-in-cyberspace/.

(2) Extended deterrence

As nuclear weapons have receded into the background in basic deterrence between or among major powers, a situation has emerged where America's extended deterrence has become less reliant on nuclear weapons, with a relative increase in the role that conventional weapons plays in deterrence. A 2008 RAND Corporation report points out that "at present and for the near term, U.S. conventional capabilities greatly reduce the need to rely on nuclear weapons for extended deterrence relative to the 1950s (when America retained a near-monopoly on nuclear weapons)."[45] Additionally, the 2010 NPR points out that reliance on conventional weapons is increasing even though nuclear weapons remain an important component of the reassurance that America provides to its allies.[46] George Perkovich argues that in the process of pursuing the long-term goal of "a nuclear-free world," the focus should shift onto capabilities other than nuclear weapons in order to maintain the credibility of America's extended deterrence.[47]

On the other hand, some also argue that in order to ensure a deterrence capability that includes extended deterrence, maintaining a nuclear capacity will be necessary.[48] Some allies are even concerned about the current path of Russian and American nuclear disarmament, and even in America, there is the view that a fair number of nuclear weapons are needed for extended deterrence. For example, *America's Strategic Posture* of 2009 displays awareness that in order for America to fulfill its assurance of extended deterrence to other countries, it is obligated to "retain numbers or types of nuclear capabilities that it might not deem necessary if it were concerned only with its own defense."[49] Furthermore, in the nuclear employment policy, it is necessary to leave a certain number of strategic nuclear weapons that possess a counter-force capacity on alert in order to maintain the credibility of extended deterrence.[50]

With regard to the positioning of tactical nuclear weapons in extended deterrence, even today forward-deployed tactical nuclear weapons are retained in Europe based on NATO's nuclear sharing arrangement, but this needs to be analyzed further from the standpoint of complex deterrence. Matthew Fuhrmann and Todd S. Sechser looked at the extended deterrence policies between a nuclear weapon state (America) and its allies and verified what the deterrence effects of nuclear weapons are when (1) there is a declaration of a commitment to defend allies; and 2) when tactical nuclear weapons are forward-deployed within the alliance's domain. According to their findings, in a general deterrence situation the deterrence effects are enhanced by (1) the declaration, but in contrast, there is almost no correlation between those deterrence effects and (2) nuclear weapons deployment. Where the effects of (1) are concerned, in many cases in a

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45 Austin Long, *Deterrence from Cold War to Long War: Lessons from Six Decades of RAND Research* (Santa Monica: RAND, 2008), p.63, http://www.rand.org/content/dam/rand/pubs/monographs/2008/RAND_MG636.pdf.

46 DoD, *Nuclear Posture Review Report*, p.xiii.

47 George Perkovich, "Extended Deterrence on the Way to a Nuclear-Free World," *Paper commissioned by the International Commission on Nuclear Non-proliferation and Disarmament*, May 2009, http://www.icnnd.org/Documents/Perkovich_Deterrence.pdf.

48 John J. Klein, "Towards A Better U.S. Nuclear Strategy," *Journal of Strategic Security*, vol.7, no.3 (Fall 2014), pp.84-94, http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1368&context=jss.

49 William J. Perry et al., *America's Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States* (Washington, D.C.: United States Institute of Peace Press, 2009), p.21, http://www.usip.org/sites/default/files/America's_Strategic_Posture_Auth_Ed.pdf.

50 Tosaki, "Senryaku Kakuheiki Sakugen ni muketa Kadai," p.37.

general deterrence situation the declaration of commitment is not undertaken explicitly. Even in these cases, however, the very fact that countries are in an alliance relationship with a nuclear weapon state sends a suggestive signal to deterred countries, which indicates that nuclear weapons are beneficial to extended deterrence. On the other hand, where (2) is concerned, the findings are only applicable to new foreign nuclear deployments. Fuhrmann and Sechser conclude that if, for example, current NATO's deployment of tactical nuclear weapons was terminated, it could end up giving deterred countries the impression that NATO was weakening, potentially undermining deterrence.[51]

On the other hand, the dramatic increases in the capabilities of conventional weapons brought about by the advancement of military technologies are starting to have a considerable impact on America's extended deterrence. The Conventional Prompt Global Strike (CPGS) system being developed by America is one such example. CPGS is based on a leading-edge military technology said to make it possible to accurately destroy any target on earth using a non-nuclear warhead that is carried by a strategic missile such as an ICBM before detaching at a near-space altitude and then accelerating to fly at hypersonic speeds of Mach 5 or faster.[52] The 2010 NPR concludes that in the context of extended deterrence, CPGS weapons are conventional weapons with a high utility value, particularly against time-urgent regional threats, and states that their development will move forward while taking the stability of America's nuclear relationships with China and Russia into consideration.[53]

It must also be pointed out that the diversification of threats in complex deterrence has been transforming the positioning of nuclear weapons in extended deterrence. In the Ukraine crisis, NATO currently finds itself at a loss over the question of "what to deter, and with what." The threat directly facing NATO in Ukraine is not an invasion by Russia's regular military forces, but rather, an invasion by irregular military forces with no clear involvement by the Russian government, as was witnessed in Crimea, or by troops whose nationality is not identified, or the incitement of members of the local Russian community and armed insurgents linked to them. These are threats in which traditional military and diplomatic means are combined with information and economic means,[54] and they are fundamentally connected to Russia's threat awareness, which was mentioned earlier. It is difficult to imagine that nuclear deterrence would be effective against these highly probable complex threats, and nor does it appear that the guarantee of extended nuclear deterrence can reassure allies facing such threats.

Furthermore, in a complex deterrence situation a cyber-attack on America's allies is also a conceivable possibility. Richard Kugler views the issue of how to deter such attacks, and what sort of commitment America will have to make in order to achieve that, as important challenges

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51 Matthew Fuhrmann and Todd S. Sechser, "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence," *American Journal of Political Science*, vol.58, no.4 (October 2014), pp.919-935, http://faculty.virginia.edu/tsechser/Fuhrmann-Sechser-AJPS-2014.pdf.

52 "China Tests Hypersonic Missile Vehicle," *The Diplomat*, January 14, 2014, http://thediplomat.com/2014/01/china-tests-hypersonic-missile-vehicle/.

53 DoD, *Nuclear Posture Review Report*, p.34.

54 Michito Tsuruoka, "NATO wa doko e Mukau noka" [Where is NATO Headed?], *The Tokyo Foundation's Eurasia Information Network Analysis Report*, August 28, 2014, http://www.tkfd.or.jp/research/eurasia/a00713.

from the standpoint of extended deterrence.[55] It has also been pointed out that unless America can deter cyber-attacks, the appeal of cyber-weapons to hostile forces will increase and the credibility of America's extended deterrence, including the nuclear deterrent, is likely to be undermined.[56]

3. Implications for the Asia-Pacific region

(1) Inter-state deterrence relationships

According to Paul, inter-state deterrence relationships among great powers in the Asia-Pacific region represent a "recessed general deterrence" situation. However, despite the growing economic relationships between America and China and Japan and China, a state of "limited rivalry" has developed. There is also the danger of intensified rivalries in the future. In addition to that, as a result of North Korea's nuclear development problem and the activities of international terrorist organizations, the components of the international system have grown less clear and deterrence is growing increasingly complex.[57]

Looking at the deterrence relationship between America and China, to begin with, in the 2010 NPR America vows to maintain strategic stability with China just as it does with Russia. However, unlike Russia, with which America has an almost symmetrical capability on the strategic nuclear weapons front, it has an asymmetrical relationship with China. China possesses around 240 nuclear warheads, and of them, around 140 are estimated to be mounted on ballistic missiles and operational, but these nuclear warheads are stored at locations other than the People's Liberation Army Rocket Force's missile bases. Additionally, China does not keep its strategic nuclear force ready for immediate launch, and neither is China developing an early warning capacity for that. Although there has been an active debate within China that its no-first-use (NFU) policy for nuclear weapons should be reviewed, this is yet to reach an actual review.[58] Despite this asymmetry on the strategic nuclear weapons front, it can be said that the strengthening relationship between America and China on the economic front has made it possible to maintain the state of general deterrence between the two.

Although on the surface the China-Russia relationship is externally promoted as close, in reality, it has become increasingly complicated. On the nuclear deterrence front in particular, Russia is concerned that the nuclear gap it now enjoys on China will narrow.[59] On the other hand, there are also some obscure factors with regard to how the two countries recognize the power balance surrounding their conventional forces. For example, Vietnam's acquisition of six Kilo-class submarines based on a contract with Russia in 2009 could have implications for China in terms of deterring China's activities in the South China Sea.[60] The first submarine has already been

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55 Richard L. Kugler, "Deterrence of Cyber Attacks," Franklin D. Kramer, Stuart H. Starr, and Larry K. Wentz, eds., *Cyberpower and National Security* (Washington, D.C.: National Defense University Press, 2009), p.339.

56 Brian M. Mazanec and Bradley A. Thayer, *Deterring Cyber Warfare: Bolstering Strategic Stability in Cyberspace* (Houndmills: Palgrave Macmillan, 2015), p.32.

57 T. V. Paul, "Nuclear Weapons and Asian Security in the Twenty-first Century," N. S. Sisodia, V. Krishnappa and Priyanka Singh, eds., *Proliferation and Emerging Nuclear Order in the Twenty-first Century* (New Delhi: Academic Foundation, 2009), pp.29-31.

58 Narang, *Nuclear Strategy in the Modern Era*, p.137.

59 The National Institute for Defense Studies, *East Asian Strategic Review 2014*, March 2014, p.213.

60 "Vietnam's China Challenge: Making Asymmetric Deterrence Work," *The Diplomat*, September 9, 2014, http://thediplomat.com/2014/09/vietnams-china-challenge-making-asymmetric-deterrence-work/.

delivered to Vietnam, in November 2013, but this did not provoke any particular backlash from China, and it has been pointed out that Russia likewise does not recognize Vietnam's submarines as a factor that will alter the power balance.[61]

Where China-North Korea relations are concerned, the ambiguous deterrence policy that China exercises in response to North Korea's development of nuclear weapons conceivably increases the difficulties of credible threats in complex deterrence theory. China has consistently demanded that North Korea suspend its nuclear development, and has been seeking North Korea's denuclearization at the Six Party Talks also, but China has been reluctant to exercise compelling force in order to deter North Korea's nuclear development. It has been noted that this ambiguous policy reflects the dilemma China faces: although it desires North Korea's denuclearization, it also wants to avoid a regime collapse in North Korea to ensure the country remains a strategic buffer zone.[62] This is potentially creating a situation in which China cannot deter North Korea's provocative actions.

With regard to America-North Korea relations, America thus far has refrained from exercising military force in response to North Korea's provocative actions. This is conceivably because the power asymmetry between the two countries is making deterrence complicated. In other words, it is creating an asymmetrical deterrence situation in which the militarily weak North Korea deters the powerful America.[63] On the other hand, in the relationship between South Korea and North Korea, North Korea has been conveying a deterrent threat to South Korea by maintaining conventional forces and a limited nuclear capability. From February to September 2014 North Korea intermittently carried out launches of short- and medium-range missiles and rocket artillery, seeking to intimidate South Korea and neighboring countries.[64]

Where the deterrence relationship between India and Pakistan is concerned, like China, India adopts an NFU policy on the one hand, while Pakistan, on the other hand, adopts a first-use nuclear doctrine and views its own nuclear weapons as a means of counterbalancing its conventional forces gap with India.[65] In response to an attack on the Indian Parliament in 2001, India's armed forces came out with the Cold Start doctrine in a bid to halt Pakistan's support of terrorism. This doctrine involved deploying Indian troops near the border in advance, and then carrying out limited attacks on Pakistan as retaliation should terrorist organizations supported by Pakistan carry out terrorist attacks within India. It was premised on Pakistan not using nuclear weapons to retaliate against a limited attack on conventional forces. In response to this, Pakistan embarked on developing tactical nuclear weapons, and in 2011 it announced it had carried out a test launch of the Nasr short-range

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61 Hiroshi Yamazoe, "Roshia no Indo, Chūgoku, Betonamu ni taisuru Tsūjō Heiki Yushutsu" [Russia's Conventional Arms Exports to India, China, and Vietnam], *NIDS Security Studies*, vol.17, no.1 (October 2014), p.102.

62 Li Mingjiang, "New Security Challenges for China in East Asia," *NIDS International Symposium on Security Affairs 2013: Prospects of Multilateral Cooperation in the Asia Pacific: To Overcome the Gap of Security Outlooks*, The National Institute for Defense Studies, 2014, pp.51-52.

63 Paul, "Complex Deterrence," pp.14-15. However, it has also been noted that on the occasion of the Korean Peninsula crisis in 1994, North Korea was unable to deter America from formulating a plan for conducting aerial bombings of nuclear facilities. Arreguin-Toft, "Unconventional Deterrence," p.214.

64 Paul, "Complex Deterrence," p.14. The National Institute for Defense Studies, *East Asian Strategic Review 2015*, March 2015, p.59.

65 Toshi Yoshihara and James R. Holmes, eds., *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon* (Washington, D.C.: Georgetown University Press, 2012), p.147.

nuclear missile.[66] In this way, the possibility that terrorism will trigger the use of tactical nuclear weapons between India and Pakistan has been increasing. It is assumed that India did not consider retaliating for the simultaneous terrorist attacks in Mumbai in 2008 due to its concerns that the situation could escalate into a nuclear war.[67]

In this way, deterrence relationships between or among countries in the Asia-Pacific region have general deterrence as an underlying tone, but as is evident in the relationship between India and Pakistan, regional destabilizing factors are also present, creating an unpredictable state of affairs in which the relationships are prone to deteriorating rapidly when other factors come into play. For example, the diversification of deterrence methods arising from the advancement of military technologies is beginning to cast a shadow over the Asia-Pacific region also. The CPGS mentioned earlier is one such example. America, Russia, China, and India are currently competing fiercely on CPGS research and development, and in all cases, they are major countries that have deep ties with the Asia-Pacific region. Until recently only America had successfully test-flown a hypersonic vehicle, but in early January 2014, it was reported that China had successfully conducted a test flight at hypersonic speeds using a ballistic missile. This missile is known as the Wu-14, and China is understood to be developing it for the purpose of penetrating America's missile defense systems.[68]

CPGS had been viewed as a strategic force not reliant on nuclear weapons and thus conforming to the Obama Administration's "world without nuclear weapons" concept. However, given that CPGS is beginning to provoke a new arms race between or among the major nuclear weapon states, the possibility that it will further complicate deterrence relationships between or among major powers cannot be ruled out. Already, China is thought to be in the process of developing hypersonic projectiles that can be launched from bombers, and Russia, provoked by America's CPGS development, is also said to have begun reinvesting in the rail-mobile ICBM program of the former Soviet Union era. Because CPGS weapons cannot be intercepted with current missile defense systems, the technology is likely to trigger not only a contest to develop CPGS but also an arms race over missile defense. Furthermore, unlike nuclear weapons, CPGS are weapons that can be used militarily, and so if an ICBM mounted with CPGS warheads is actually fired, it could end up being mistakenly perceived as a nuclear attack.[69] Incidentally, unlike America, whose CPGS technology is literally limited to conventional warheads, China is also exploring the possibility of mounting nuclear warheads on the Wu-14.[70]

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66 Jaganath Sankaran, "The Enduring Power of Bad Ideas: 'Cold Start' and Battlefield Nuclear Weapons in South Asia," *Arms Control Today*, November 2014, pp.16-21; Satoru Nagao, "Indo wa Kakudokutorin no doko wo Kaitei surunoka?" [Where Will India Revise the Nuclear Doctrine?], *The Tokyo Foundation's Eurasia Information Network Analysis Report*, July 17, 2014, http://www.tkfd.or.jp/research/eurasia/a00706.

67 Rajesh Rajagopalan, "India's Nuclear Policy," *NIDS International Symposium on Security Affairs 2009: Major Powers' Nuclear Policies and International Order in the 21st Century*, The National Institute for Defense Studies, 2010, p.114.

68 Katsuya Tsukamoto, "Seimitsu Yūdō Heiki Kakusan no Higashi Ajia e no Eikyō" [Proliferation of Precision-Guided Munitions and Its Impact on East Asia], *NIDS Security Studies*, vol.17, no.1 (October 2014), p.11.

69 "China Tests Hypersonic Missile Vehicle."

70 Lora Saalman, "Prompt Global Strike: China and the Spear," APCSS, April 2014, http://apcss.org/wp-content/uploads/2014/04/APCSS_Saalman_PGS_China_Apr2014.pdf.

(2) Deterrence relationships that incorporate non-state actors and cyber-space

As is commonly known, following 9/11 the threat of nuclear terrorism by international terrorist organizations received greater emphasis. The existence of the Khan network created by Pakistan's Dr. Abdul Qadeer Khan as a source of nuclear weapons and nuclear material for terrorist organizations came to light. It has been pointed out that Al Qaeda, which for some time had been trying to obtain a nuclear weapon, may have obtained the material necessary for a nuclear weapon from the Khan network, using the IMU, an extremist Islamic organization mainly active in Central Asia, as its intermediary.[71]

In the Asia-Pacific region, there has been a string of terrorist organizations intent on possessing nuclear weapons, among them the Abu Sayyaf Group and the New People's Army in the Philippines, Jemaah Islamiyah in Indonesia, Lashkar-e-Taiba in Pakistan and the Liberation Tigers of Tamil Eelam in Sri Lanka.[72] It has also been revealed that Aum Shinrikyo, which conducted the Tokyo subway sarin attack in 1995, was also planning to manufacture a nuclear weapon, and had been attempting to obtain nuclear material and nuclear weapon-related components in Russia and Australia.[73] S. Paul Kapur compares Al Qaeda and Aum Shinrikyo and suggests that since Al Qaeda possesses a constructive purpose (namely, the establishment of an Islamic state) while Aum Shinrikyo sought a destructive goal based on an end-of-the-world scenario, when the latter type of organization achieved nuclear possession, the probability of nuclear terrorism occurring would be higher.[74]

As a measure for countering the threat of nuclear terrorism, in a situation where a nuclear terrorist attack was imminent and there was no time to lose, the option of putting America's abovementioned CPGS to use against the terrorist organization to prevent the attack is being considered. While it is envisaged that a potential target might be a freight train loaded with radioactive material by a terrorist organization and headed toward a city, for example, some have criticized the CPGS employment against nuclear terrorists as unrealistic given that gathering information on such a target would take time.[75] It is questionable whether this kind of CPGS employment can be categorized as deterrence of nuclear terrorism, and contrarily, such employment is fraught with the risk of complicating deterrence. On the other hand, deterring terrorism in general, not just nuclear terrorism, is a difficult task both theoretically and in terms of policy. Japan's National Security Strategy (NSS), which received Cabinet approval in December 2013, also presents the view that "traditional deterrence may not function effectively" against non-state actors, including international terrorist organizations.[76]

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71 Takaharu Nakajima, "A. Q. Kān Nettowāku to IMU" [A. Q. Khan network and IMU], *Journal of World Affairs*, vol.57, no.10 (October 2009), pp.75-82.

72 Muthiah Alagappa, ed., *The Long Shadow: Nuclear Weapons and Security in 21st Century Asia* (Stanford: Stanford University Press, 2008), pp.329-339.

73 Sara Daly, John Parachini and Willam Rosenau, *Aum Shinrikyo, Al Qaeda, and the Kinshasa Reactor: Implications of Three Case Studies for Combating Nuclear Terrorism* (Santa Monica: RAND, 2005), pp.5-21, http://www.rand.org/content/dam/rand/pubs/documented_briefings/2005/RAND_DB458.pdf.

74 S. Paul Kapur, "Deterring Nuclear Terrorism," *Complex Deterrence*, pp.109-130.

75 M. Elaine Bunn and Vincent A. Manzo, "Conventional Prompt Global Strike: Strategic Asset or Unusable Liability?" *INSS Strategic Forum*, no.263, February 2011, pp.7-10, http://ndupress.ndu.edu/Portals/68/Documents/stratforum/SF-263.pdf.

76 *National Security Strategy*, December 17, 2013, p.6, http://www.cas.go.jp/jp/siryou/131217anzenhoshou/nss-j.pdf.

In addition to the threat of nuclear terrorism, threats in cyber-space are also a factor making deterrence relationships in the Asia-Pacific region more complicated. For example, in 2009 and 2011, government organizations and other institutions in the Republic of Korea (ROK) were subjected to large-scale DDoS (Distributed Denial of Service) attacks, followed by cyber-attacks targeting financial institutions and broadcasters. The ROK concluded that North Korea was responsible for the attacks.[77] America also concluded that a cyber-attack on Sony Pictures Entertainment in December 2014 was the work of North Korea, and imposed additional sanctions on the country.[78] Incidentally, in February 2014 it was reported that the ROK was in the process of developing a Stuxnet-like malware.[79]

Major countries such as China and Russia, not just North Korea, are deeply involved in the cyber-space threat in the Asia-Pacific, and this is something that is complicating deterrence relationships in the region. Perkovich points out that for Japan, the more likely threat that China poses is probably not an attack using military force, but coercive pressure that uses more subtle means, including computer-based instruments, and which is less likely to escalate to the use of military force.[80] Perkovich's view overlaps with the "gray-zone situations"[81] cited in Japan's National Defense Program Guidelines (NDPG).

The potential for the cyber-space threat to influence nuclear deterrence between or among states has also been noted. According to Paul Bracken, the rise in cyber-related technologies in recent years is beginning to make it possible to accurately detect and track the road-mobile nuclear missiles of China, Russia, North Korea, India, and Pakistan. Specifically, this involves using big data analysis to process information such as telecommunication information obtained from the transporter-erector-launcher (TEL) convoys loaded with these missiles, and video data recorded by small drones, in order to obtain accurate target information, including the location of missiles. Furthermore, although different in some respects to the approach used on land, these technologies reportedly can also be applied to detecting and tracking seaborne nuclear forces such as SLBMs.[82] If these cyber-space threats cause the mutual nuclear deterrence of nuclear weapon states in the Asia-Pacific region to grow fragile, we can surmise that deterrence relations in the region will grow more complex.

Conclusion

This article considered complex deterrence theory as one attempt to explore deterrence concepts that respond to changes in the international security following the Cold War. The deterrence dyad of America and the Soviet Union during the Cold War assumed a "severe conflict" (Morgan), and nuclear weapons were considered to be the main deterrent means. Consequently, that deterrence relationship could be characterized by the simplicity and clarity of the other five elements

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77 Yasuhiko Taniwaki, *Wagakuni no Saibā Sekyuriti Senryaku [Cybersecurity Strategy in Japan]*, National Information Security Center, July 3, 2014, p.5, https://www.jaipa.or.jp/event/IGF-J/150324/150324_taniwaki.pdf.

78 *East Asian Strategic Review 2015*, pp.61-62.

79 "South Korea to develop Stuxnet-like cyberweapons," *BBC*, February 21, 2014, http://www.bbc.com/news/technology-26287527.

80 Perkovich, "Extended Deterrence on the Way to a Nuclear-Free World," p.7.

81 *East Asian Strategic Review 2014*, p.56.

82 Paul Bracken, "The Cyber Threat to Nuclear Stability," *Orbis*, vol.60, no.2 (Spring 2016), pp.188-203.

(rationality, retaliatory threat, unacceptable damage, credibility, and stability) cited as its premises. This relationship changed markedly with the increased fluidity of the international system brought about by the collapse of the Soviet Union, however, and became unclear and vague. The post-Cold War international system has come to be characterized by the asymmetry of power between or among states, the participation of non-traditional actors, including international terrorist groups, and the recession into the background of deterrence in relationships between or among major powers. This development has transformed deterrence into something complex and difficult to execute. Complex deterrence theory analyzes this complicated deterrence concept according to the deterrence relationships between the various actors making up the international system following the Cold War. This is based on the awareness that after the Cold War, "the nature and type of actors, their power relationships, and their motives become unclear" (Paul).

Complex deterrence theory attempts to explain the vague deterrence relationships witnessed between major powers following the Cold War using the concept of general deterrence. In a situation where general deterrence is maintained between or among major powers, since a clear military threat such as the one posed by the Soviet Union in the Cold War is not assumed, the threat of deterrence also becomes vague and suggestive, and nuclear weapons lose their lead role as a means of deterrence and recede into the background. Nevertheless, general deterrence is perceived as a complex and vague deterrence relationship and is by no means stable. Furthermore, because general deterrence between or among major powers is influenced by deterrence relationships with other actors, it develops into a state of complex deterrence. For example, after the Cold War, North Korea, Iran, and others embarked on developing nuclear weapons, increasing the danger of nuclear proliferation. This compelled America to deter nuclear development by these countries, but since these countries do not necessarily make rational judgments about deterrence threats, it became difficult to respond using traditional deterrence policies. Additionally, with 9/11 as the turning point, non-traditional actors such as international terrorist organizations entered the traditional international system that had been composed of states, which facilitated greater fluidity in the international system and significantly lowered the credibility of the threat of deterrence by states. Consequently, despite America being the only superpower remaining after the Cold War, it now faces the risk of falling into a "deterrence trap" (Adler) that renders it unable to deter the actions of a weaker actor. This is being driven partly by the increasing influence of the domestic and foreign "audiences" for deterrence activities accompanying the advance of globalization and the expansion of the Internet space. Additionally, the diversification of deterrence methods brought about by the advancement of military technologies, and the expansion of the deterrence space to include cyber and other spaces, have also played a part in driving the complex deterrence situation.

In a complex deterrence situation, nuclear weapons have receded into the background as a deterrence measure and their scale is also shrinking overall. However, whether or not the role and scale of nuclear weapons will contract further in the future will depend on the course followed by international relations, including deterrence. Consequently, nuclear weapon states are exploring how to position the nuclear deterrent force in their own military strategies. On the basic deterrence front, the U.K. is pursuing deterrence that relies on a minimum of strategic nuclear weapons and minimum alert posture, while both the U.S. and Russia still keep large numbers of strategic nuclear weapons on alert. Russia, in particular, continues to attach importance to the role strategic nuclear weapons play in deterrence and is said to be moving ahead with developing new

heavy ICBMs.[83] In America, debate is also underway on the positioning of nuclear weapons in deterring cyber-attacks on the country. In its extended deterrence, America is attempting to reduce its dependence on nuclear weapons while seeking to expand the role of conventional weapons, but the view that a certain number of nuclear weapons is needed for extended deterrence also persists. On the other hand, it is difficult to think of extended deterrence as effective in situations such as the Ukraine crisis.

A complex deterrence situation can be said to exist in the Asia-Pacific region due to the complicated deterrence relationships that exist between or among nuclear weapon states, countries suspected of developing nuclear weapons and non-traditional actors. The influence of this complex deterrence situation is clear even by looking solely at deterrence relationships with China, a rising power in the Asia-Pacific region. The observation that "Neither Japan nor the U.S. is able to come out with a clear and simple direction with regard to China that resembles the containment used against the Soviet Union during the Cold War period, and this is due not only to the complex and multifaceted nature of their relationships with China, but also because various scenarios are envisaged from the lack of transparency about China's future"[84] can be called absolutely correct. Japan's "strengthening of deterrence in gray-zone situations"[85] (NDPG 2013) from here on is a deterrence policy that takes into account the complex deterrence situation in the Asia-Pacific region, and it will conceivably be beneficial to ensuring the region's general deterrence. The security environment surrounding Japan will become increasingly severe in the future, and under those circumstances, in the interests of achieving Japan's own security as well as the peace and stability of the region, it will be necessary to continue striving to clarify the complicated deterrence relationships that exist in the Asia-Pacific region.

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83 "Russia's Sarmat 100-ton ballistic missile may be test launched in 2016-2017 -source," *TASS*, January 29, 2015, http://tass.com/russia/774071.

84 JIIA Center for the Promotion of Disarmament and Non-Proliferation, *Hokutō Ajia ni okeru Kaku Risuku no Manējimento [Nuclear Risk Management in Northeast Asia]*, fiscal 2013 commissioned research, MOFA, March 2014, p.11, http://www.cpdnp.jp/pdf/003-01-013.pdf.

85 *East Asian Strategic Review 2014*, pp.56-59.