

Non-Lethal Weapons and Force-Casualty Aversion in 21st Century Warfare

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For every battle of the warrior is with confused noise, and garments rolled in blood; but this shall be with burning and fuel of fire.¹

Introduction

One distinct feature that differentiates wars from other forms of conflicts is the application of lethal force measured by the degree of blood-letting. German Chancellor, Otto von Bismarck, used the phrase 'blood and iron' to articulate the incontrovertible relationship between the use of force and the turnout of casualties.² The design of weapons (which Bismarck connoted as iron) is basically meant to spill the blood of the enemy to a point that his will and capacity to resist is overwhelmingly depleted. War is essentially an act of force³ and the application of such force has been known to result in

¹ Isaiah 9:5, King James Version, Nashville, Tennessee: Broadman and Holman Publishers, 2009.

² German Chancellor Otto von Bismarck gave the 'Blood and Iron' Speech in 1862 stressing the need for military preparedness to aid in the unification of Germany and the expansion of its continental power.

³ Antulio J. Echevarria II, *Clausewitz and Contemporary War*, London: Oxford University Press, 2007. See also Hew Strachan and Andreas Herberg-Roth (eds.), *Clausewitz in the Twenty-First Century*, London: Oxford University Press, 2007.

bloodshed. Indeed, weapons have been historically known as the indispensable means through which force is applied in its brute lethality.

However, the 21st century has witnessed a turning point in the dynamic development in weapon technology and a significant shift in defense technology of most states. This is evident in the development of weapons with non-lethal capabilities which seek to apply force, but at the same time, avert casualties. Such weapons are designed to challenge the enemy's will and capacity to resist without spilling blood. The scientific and technical advances in non-lethal weapons hold a significant potential for minimising casualties in warfare. Such weapons are gaining operational possibilities as a consequence of technological advances and the nature of conflict situations encountered by military forces in the 21st century. Casualty aversion can be identified to be the driving factor explaining the shift in defense technology to non-lethal weapons. Although non-lethal weapons remain an underutilised asset as shown in the slow rate at which the defence forces of states embrace and invest in them, the need to avert military and civilian casualties justifies why non-lethal technology has emerged in the practice of warfare.

Revolution in Military Affairs and the Development of Non-lethal Weapons

The development of non-lethal options has been motivated by political factors, namely casualty aversion. Warring dyads mostly do not tolerate significant casualties on their side. Sensitivity to military losses plays a key role in limiting a state's freedom to deploy the armed forces in military missions. This in Yagil Levy's view is especially true for western democracies.⁴ To this end, minimising the risk of casualties - casualty shyness - during war tends to sustain public support for war, especially for democracies. The need to put more 'boots on the ground' dramatically increases the risk that soldiers will be injured or killed.⁵ However the risk that soldiers will be injured or killed can be avoided by relying on non-lethal weapons. Casualty shyness can be

⁴ Yagil Levy, 'The Tradeoff between Force and Casualties: Israel's Wars in Gaza, 1987-2009', *Conflict Management and Peace Science*, Vol. 27, No. 4, September 2010, p. 388.

⁵ Patricia L. Sullivan, 'Sustaining the Fight: A Cross-Sectional Time-Series Analysis of Public Support for Ongoing Military Interventions' *Conflict Management and Peace Science*, Vol. 25, No. 2, 2008, p. 117.

greatly achieved by recourse to non-lethal weapons. This has been made possible by certain revolutionary changes in the manner in which wars are fought.

Military history has drawn our attention to exponential change in weapons and the manner in which wars are fought. Such changes in the quantity and quality of weapons of war are considered by policy and academic circles as revolutionary and transformative (the RMA is also referred to as *Transformation*). The history of organised warfare has been marked by the rational application of technology to enhance the lethality of weapons. The level of weapons technology has been known to play a vital part in determining the nature and outcome of war. However, it should be stressed that how warfare is conducted is not based solely on technology at the disposal of the belligerents, rather, as Colin Gray notes, 'there is a triologue among what technology permits, what politics requires, and what society allows'.⁶ Historically, weapons have not been static but rather dynamic over time with its dynamism dependent on prevailing technologies. Since the change in the form and lethality of weapons is dependent on the influence of technology, the term 'weapon technology' has been used as a broad spectrum nomenclature to define and reinforce the inextricable relationship between weapons and technology. To this end, organised warfare and the technology of weaponry have been closely linked.

The development of non-lethal weapons has been the undeniable consequence of rapid technological advances in the 21st century. Rapid technological and organisational development in warfare has led to a rethink over the future of warfare. In the lexicon of military history, this idea has been immersed in a concept known as Revolution in Military Affairs (RMA). Principally connected with modern information, communications and space technology, RMA is often linked to current discussions on the political and economic context of globalisation and the end of the Cold War. The term has also been applied to revolutionary adaptations by military organisations that may be necessary to deal with the changes in weapon technology.

Basically, two competing perspectives usually come to the forefront of RMA discussions. First is the perspective that focuses primarily upon changes in states and the role of an organised military in using force. This approach highlights the global

⁶ Colin S. Gray, *Another Bloody Century: Future Warfare*, London: Phoenix, 2005, p. 120.

political, social and economic factors (i.e the nature of the emerging international order), which demands a completely different type of military and organisational structure to apply force in the future. The second perspective highlights the evolution of weapons technology, information technology, military organisation and military doctrine among advanced powers. It identifies the basic combination of required force assets, namely; Command, Control, Communications, Computers, Combat Systems, Intelligence, Target Acquisition and Reconnaissance (C⁵ISTAR). This approach also incorporates other sophisticated technologies such as unmanned aerial vehicles (UAVs), nanotechnology, robotics, and biotechnology.

Suffice to note that RMA is not a concept that is akin to the 21st century. Military history documents distinct revolutions in military organisation across ages. The stone, bronze and iron ages were marked by distinctive application of technology in weaponry which affected the organisation of warfare. Human progress as it relates to war and society has been marked also by three distinct waves. The 'First Wave' was predominantly agricultural and as such war was fought to seize and hold territory. The 'Second Wave' was industrial with warfare composing mostly of attrition in order to wear down the enemy's capacity to feed, clothe and equip armies. The 'Third Wave' captures an information age where warfare seeks to erode or destroy the enemy's means of collecting, processing, storing and disseminating information. This is the major preoccupation of the current revolution in military affairs. Distinctively, 21st century RMA is characterised by four types of changes: extremely precise, stand-off strikes; dramatically improved command, control and intelligence; information warfare; and nonlethality.⁷

According to Andrew Krepinevich, a military revolution

...occurs when the application of new technologies into a significant number of military systems combines with innovative operational concepts and organisational adaptation in a way that fundamentally alters the character and conduct of conflict. It does so by producing a dramatic

⁷ Steven Metz and James Kievit, 'Strategy and the Revolution in Military Affairs: from Theory to Policy', June 27, 1995 www.au.af.mil/au/awc/awcgate/ssi/stratrma.pdf, p. v. (Accessed 15 January 2013).

increase – often an order of magnitude or greater – in the combat potential and military effectiveness of armed forces.⁸

As such, a revolution in military affairs dramatically increases combat effectiveness by four types of simultaneous and mutually supportive change: technological change; systems development; operational innovation; and organisational adaptation. According to Metz and Kievit,⁹ the relative priority among these elements varies from revolution to revolution. The 21st century revolution in military affairs is heavily shaped by communication and laser technology which have the potential of altering the relationship between accuracy and distance in the application of military force. The defining characteristic of the current RMA is a reduction in both casualties and the collateral damage normally associated with military combat operations. To this end, the development and deployment of non-lethal weapons constitute a significant part of military thinking, organisation and development.

Neil Davison¹⁰ has noted that the definition of non-lethal weapons is convoluted, given scattered operations experience and erratic development of technologies. In Lewer and Schofield's view, the term 'non-lethal' has been subject to criticism as both a euphemism and an oxymoron when applied to weapons.¹¹ Pundits argue that it would rather be more appropriate to use other terms such as 'less-than-lethal', 'disabling', 'soft-kill', 'pre-lethal' and 'worse-than-lethal' to reflect more accurately the true nature of non-lethal weapons.¹² Proponents of non-lethal weapons acknowledge that ambiguity exists since the use of any weapon brings with it the risk of injury and death. But they argue that the term 'non-lethal' accurately reflects the intention neither to kill nor to harm permanently. For this reason, they reject the terms 'disabling' or 'less-than-lethal' because they imply permanent effects (such as loss of limbs).¹³ Opponents argue

⁸ Andrew F. Krepinevich, 'Calvary to Computer: The Pattern of Military Revolutions', *The National Interest*, No. 37, Fall 1994, p. 30.

⁹ Metz and Kievit.

¹⁰ Neil Davidson, "The Early History of 'Non-Lethal' Weapons", Occasional Paper No. 1, Bradford Non-Lethal Weapons Research Project (BNLWRP), Department of Peace Studies, University of Bradford, UK, December 2006.

¹¹ Nick Lewer and Stephen Schofield, *Non-Lethal Weapons: A Fatal Attraction? Military Strategies and Technologies for 21st Century Conflict*, London & New York: Zed Books, 1997, p. 5.

¹² *Ibid.*

¹³ *Ibid.*, p. 6.

that more accurate descriptions would be either 'pre-lethal', implying temporary incapacitation in order to facilitate a follow-on attack with conventional weapons; or 'worse-than-lethal', to highlight the terrible psychological trauma that may affect individuals if the use of these weapons result in severe injuries, for example, blinding by lasers.¹⁴

Basically, non-lethal weapons constitute electromagnetic, kinetic, non-lethal chemical devices that can be used to limit or dissuade aggression and destroy lethal capability with minimal damage to non-combatants, combatants and the environment.¹⁵ Examples include acoustic, laser and high power microwaves, non-nuclear electromagnetic pulses, high power jamming, obscurants, foams, glues and slicks, malodorants,¹⁶ sticky nets, supercaustics, magneto-hydrodynamics, pepper spray, information warfare and soldier protection. Lasers are employed for target detection, target designation and deterrence. In all, non-lethal weapons cover an array of weapon systems which are: designed to deter or neutralise the belligerent; not designed to kill, cause permanent harm or incidental injury; designed to have a temporary or reversible impact; designed to cause minimum collateral damage to property and the environment.¹⁷

Given their operational dynamics, non-lethal weapons thus seek to increase the spectre of force-casualty aversion (casualty shyness) and collateral damage in a world where there is an absence of guarantee for a casualty-free battle. In a world with ideals such as democracy, citizens abhor continuing and consistent casualty from war. In Christopher Lamb's view;

Non-lethal weapons are discriminate weapons that are explicitly designed and employed so as to incapacitate personnel or material, while minimising fatalities and undesired damage to property and environment. Unlike weapons that permanently destroy targets through blast,

¹⁴ Ibid.

¹⁵ Chris Morris, Janet Morris, and Thomas Baines, 'Weapons of Mass Protection: Nonlethality, Information Warfare and Airpower in the Age of Chaos', *Airpower Journal*, Vol. 9, No. 1, Spring 1995, p. 27.

¹⁶ Malodorants are foul-smelling chemical compounds that are seen as having potential use for controlling crowds, clearing facilities and area denial.

¹⁷ James C. Duncan, 'A Primer on the Employment of Non-Lethal Weapons', *Naval Law Review*, Vol. XLV, 1998, p. 6.

fragmentation, or presentation, non-lethal weapons have relatively reversible effects on targets and/or are able to discriminate between targets and non-targets in the weapon's area of impact.¹⁸

Here the focus is on the distinction between traditional, conventional weapons and non-lethal weapons. Some advocates of non-lethality suggest that there are qualitative differences between non-lethal weapons and conventional weapons that have profound implications for military operations and strategy. As argued by Morris, Morris and Baines:

Non-lethal weapons are weapons whose intent is to overwhelm an enemy's lethal force by destroying the aggressive capability of his weapons and temporarily neutralising his soldiers.¹⁹

From the foregoing, it would be difficult to disagree with Lewer and Schofield's submission that we have two major categories of definition – the first that concentrates on the physical properties of weapons not intended to kill or permanently injure, and the second that stresses their operational characteristics as a potentially radical break from traditional warfare.²⁰ In all, non-lethal weapons are tools for achieving military goals while respecting the principles of the laws of warfare – military necessity, proportionality, discrimination, avoidance of unnecessary suffering and minimising collateral damage.²¹ Be that as it may, is there any guarantee that any weapon can be 100 percent non-lethal? Some pundits see non-lethal weapons as a lack of political resolve and weakness by not producing the physical effects necessary to punish an aggressor. There is also the belief that non-lethal weapons would make war more likely because of the perceived reduction of its destructive consequences.

Warfare in the 21st Century and the Proclivity Towards Non-Lethal Weapons

¹⁸ Christopher Lamb, 'Non-lethal Weapons Policy' *Department of Defense Directive*, 1 January, 1994.

¹⁹ C. Morris, J. Morris and T. Baines, 'Weapons of Mass Protection: Non-lethality, Information Warfare, and Airpower in the Age of Chaos' *Airpower Journal*, Spring 1995, p. 24.

²⁰ Lewer and Stephen Schofield, p. 10.

²¹ G. T Allison and P. X Kelley, *Nonlethal Weapons and Capabilities: Report of an Independent Task Force*, New York: Council on Foreign Relations, 2004, p. 29.

The 21st century has witnessed faster communication and closer international networks accelerated by the forces of globalisation and globalism. This in turn has increased the number of actors engaged in warfare thereby further complicating the dynamics of war. Non-state actors like the Afghan and Iraqi insurgents now compete with state actors for the battlefield. As a result, the battlefield has greatly expanded beyond space to include the element of time carried out on a digital frontier. Warfare has taken a leap forward from a three dimensional engagement to a four dimensional one.²² The involvement of non-state actors like al-Qaeda and Hezbollah in warfare has altered the traditional strategic calculus of warfare as well as the issues of lethal and non-lethal weapons. Non-state actors tend to be nimble and operate in the shadows, employing weapons that go well beyond conventional ones.²³ Essentially, 21st century warfare is marked by asymmetry, demilitarisation and privatisation. This has resulted in less reliance on massive firepower and tremendous military capabilities.

Non-lethal weapons include those weapons designed to help achieve political and military objectives by providing a means to lever or compel a change in an opponent's behaviour while at the same time precluding the need to intervene with overwhelming lethal force.²⁴ Non-lethal weapon technologies promise to transform future wars to short, bloodless conflicts. The use of non-lethal weapon systems in the early stages of a conflict has been argued to reduce the risk of escalation, and give diplomacy a chance to work.²⁵ It was around the 1960s that a group of varied weapons technologies began to be described collectively as 'non-lethal' weapons.²⁶ Irritant chemical weapons used during World War I were grouped under this category of weapons. Lewer and Schofield argue that

²² Land, water and air were the three dimensions in which wars were traditionally fought. The advent of electronic warfare (EW) ushered in the fourth dimension, which not only influenced the other three dimensions but also had an impact on shaping strategy and development of weapon systems and platforms. See Sanjay Poduval, *Electronic Warfare: War in the Fourth Dimension*, New Delhi, India: KW Publishers Pvt. Ltd., 2009. See also Alfred Price, *War in the Fourth Dimension: US Electronic Warfare, From the Vietnam War to the Present*, London: Greenhill Publishers, 2001.

²³ James Turitto, 'Understanding Warfare in the 21st Century', *International Affairs Review*, Vol. XVIII, No. 3, Winter 2010.

²⁴ Duncan, p. 6.

²⁵ *Ibid.*, p. 3.

²⁶ Neil Davidson, 'The Early History of 'Non-Lethal' Weapons', Occasional Paper No. 1, Bradford Non-Lethal Weapons Research Project (BNLWRP), Department of Peace Studies, University of Bradford, UK, December 2006.

...many of the technologies that might form the basis of a non-lethal armoury had already been identified in the 1960s and 1970s but they were given no real priority in context of Cold War military planning.²⁷

The United States is believed to have been the trailblazer in the development, deployment and use of non-lethal weapons. The 6th Century Chinese warrior-philosopher, Sun Tzu, had argued that a good general gains victory without battle. He therefore advocated for 'bloodless battles' and 'winning without fighting'.²⁸ This laid the foundational thinking for strategic deterrence. Significantly, non-lethal weapons hold the potential of providing a deterrent prior to crisis development or could diffuse the crisis before it expands.²⁹

Military interest in non-lethal weapons began to develop in earnest from the early 1990's. Indeed, since the Gulf War, there has been increased interest in the use of non-lethal weapons by the United States. This was made possible by the changing international security environment marked by the end of the Cold War. As Lewer and Schofield noted,

Only with the end of the Cold War and the re-evaluation of security issues was the potential of non-lethal weapons considered seriously. Compared to the 1990s, general technological advances had enhanced the prospects of developing fieldable equipment in terms of size, accuracy, speed of deployment, etc. But, in themselves, technological advances would have been sufficient to secure funding without some strategic rationale that could attract support from influential organisations and individuals including government policy makers and the armed forces.³⁰

Neil Davison³¹ notes that this strategic rationale was that non-lethal weapons were needed in response to the predicted rise in low-intensity conflict and interventions by 'Western' countries in regional conflicts. This was particularly in relation to

²⁷ Lewer and Schofield, pp. 34-35.

²⁸ Sun Tzu, *The Art of War*, (ca. 500 BC).

²⁹ Edward N. Luttwak, 'Towards Post-Heroic Warfare', *Foreign Affairs*, Vol. 74, No. 3, May/June 1995, p. 114.

³⁰ Lewer and Schofield, p. 34.

³¹ Neil Davidson, "The Early History of 'Non-Lethal' Weapons", Occasional Paper No. 1, Bradford Non-Lethal Weapons Research Project (BNLWRP), Department of Peace Studies, University of Bradford, UK, December 2006. See also Neil Davison, *'Non-Lethal' Weapons*, London: Palgrave Macmillan, 2009.

Operations Other Than War (OOTW) such as peacekeeping and peace enforcement, where conventional military weapons and tactics would not be effective.³² Beyond that, other designated Military Operations Other Than War (MOOTW) such as adventurism, insurgency, ethnic violence, terrorism, narcotic trafficking, and domestic crime have been argued to be decisively and effectively countered with low lethality operations, tactics and weapons.³³ Such operations demand the application of minimum force effective enough to deter perpetrators without reaching the threshold of violence.

Technically, when the designs of weapons no longer satisfy the purpose of killing, they merely become toys in the hands of belligerents and the act of warfare becomes nothing more than an organised drama. Carl von Clausewitz raised the dark, bloody, fearful qualities of combat when he submitted thus:

We are not interested in generals who win victories without bloodshed. The fact that slaughter is a horrifying spectacle must make us take wars more seriously, but not provide an excuse for gradually blunting our swords in the name of humanity.³⁴

In Carl von Clausewitz's view, if the turnout of casualties in war connotes horror, then it should be the reason for treating war with more respect. This is what makes war 'a serious business for a serious purpose'.³⁵ However, our attention must be drawn to the fact that it is not the killing, wounding or hurting in themselves that help a military win in battle. Being killed, wounded or hurt is only one of the ways in which one can be forced to end combat. The essence of war is to deny the enemy the ability and resilience to resist. If this can be achieved without bloodletting and recourse to lethal weapons, then it holds the possibility of gaining widespread recommendation, at least, to the pacifist and idealist. A logical extension of this thinking is that if weapons existed that could cause no suffering and reach the same result, then most

³² Ibid.

³³ C. Morris and J. Morris, *Non-Lethality: A Global Strategy*, Washington, DC: US Global Strategy Council, p. 1.

³⁴ Carl von Clausewitz, *On War*, Ed. and Trans. M. E. Howard and P. Parrett, Princeton, NJ: Princeton University Press, 1976 [1832].

³⁵ See Andreas Herberg-Rothe, *Clausewitz's Puzzle: The Political Theory of War*, New York: Oxford University Press, 2007. See also Hew Strachan and Andreas Herberg-Roth (eds.), *Clausewitz in the Twenty-First Century*, London: Oxford University Press, 2007.

humanitarians would probably have no hesitation in recommending their use.³⁶ However it is likely that given this possibility, the proclivity towards war would increase and their frequency and ubiquity might be expected to have a dampening effect on interstate cooperation. An example can be drawn from cyber warfare which has remained largely non-lethal, but its practice has already been having serious implications for the quality of relations, for instance, between China and the US.

Beyond this, what is the expectation that warring dyads will keep to the rules of non-lethality in warfare? The history of warfare, which military history studies, shows that even state actors which are bound by the principles of international humanitarian law and the moderation of international conventional weapon treaties have seldom kept to the basic rules of engagement (ROE) as it bothers on the lethal quality of weapons employed during combat. The rules of the game have rarely been observed in the course of most warfare with lethal capabilities and there is least expectation that the situation will change in warfare with non-lethal capabilities. State actors engaged in warfare have been known to make use of outlawed weapons such as *sarin* and mustard gases as well as non-conventional weapons such as chemical, atomic and hydrogen bombs. This is against the background that a standard operating behaviour in warfare is at least expected from state actors engaged in warfare with lethal capabilities. The possibility of expecting a standard operating behaviour from state and non-state actors with non-lethal capabilities remains a debated issue begging for increased scholarly introspection. The increasing involvement of non-state actors in 21st century warfare with shadowy and amorphous characteristics paints a gloomier picture of dyads playing to the rules of non-lethality. Military operations which involves a state actor and terrorists or insurgents as dyads is likely to face a scenario where one side initially agreeing to fight with only non-lethal weaponry is startled at the devastation visited upon its fighting forces by an adversary who decided to play by a different set of rules.

The 21st century has been marked by a definite paradigm shift in the way war is conducted. War is no longer conducted as pitched battles far away from civilian areas.

³⁶ Frédéric Mégret, 'The Debate on Non-lethal Weapons: Why kill and Wound at All?' www.croixrouge.ca/cmslib/general/oteoc_megret.pdf, p.7 (Accessed 20 January 2013).

Both the military and civilians are possible casualties in any war situation.³⁷ Indeed, the distinction between armed combatants and unarmed civilians has increasingly been blurred when evaluating war casualties. Combat operations have been known to occur in zones that have a high concentration of civilians. Thus, 21st century warfare has been more of Military Operations in Urban and Rural Terrain (MOURT). Soldiers are now mostly based in cities resulting in urbanised impacts on military operations. Given this operational reality, the number of collateral casualties has risen significantly in recent years and now accounts for the larger part of civilian casualties caused by some conflicts.³⁸ Thus, allowing the same lethal conventional weapons systems that are used against combatants in a zone where there are no civilians to be used in a zone where there are civilians, give rise to avoidable increase in the threshold of casualties. It also leads to unnecessary suffering disproportionate with the political objective in question. To this end, contemporary military operations in the 21st century are unlike wars of previous centuries where success was measured in purely military terms.

It has been argued that restricting belligerents to the exclusive use of non-lethal weapons in warfare is inconceivable and unrealistic since the opposing wills of the belligerents are in violent contest. There is also a possibility that a side that envisages defeat might resort to the use of lethal weapons to actualise victory. As evident in the use of lethal weapons in warfare, a side that seeks to attain quick victory or envisages defeat sometimes resorts to more lethal weapons disproportionate with the political objective in question. An example is the United States' use of the atomic bomb on the Japanese cities of Hiroshima and Nagasaki on the 6th and 9th of August 1945 bringing an end to World War II.

Force-Casualty Aversion and the Inclination Towards Non-Lethal Weapons

³⁷ This situation in military history is known as collateral damage. It is frequently used to refer to the incidental destruction of civilian property and non-combatant casualties.

³⁸ Mégret, p. 8.

Military history has been marked by increased lethality of weapons on the part of belligerents to achieve political objectives through military means. Warfare is marked by the turn-out of casualties on both sides – a situation which seems unlikely to change in the nearest future. It is quite difficult to disagree with Michael Elliot's overall assertion that 'if politics is a constant of war, so are casualties'.³⁹ Belligerents try as much as their weapon technology and strategy allow to reducing casualties on their side while increasing casualties on the enemy side. A good example is observable in the First Gulf War in which the Iraqi forces lost around 100,000 men as compared to about 140 on the side of the US-led Coalition. The most striking was the Kosovo War which has gone down in military history as the first war in which the victors did not lose a single man in combat.⁴⁰ However, current RMA has increased the probability of managing the risk to which combatants and non-combatants alike are exposed to fatalities. Force is the *ultima ratio* in warfare and the employment of force in combat unavoidably results in casualties. An increase in the force level of dyads is complemented with a rise in casualties giving rise to the concept of the 'force-casualty ratio'. The greater the force applied, the more the casualty count increases. However, the turnout of casualties beyond a certain threshold tends to mount considerable influence on public support for war especially in democracies. As such, among democracies, there has been increasing articulation on the use of force without resultant casualties. In essence, could casualties be averted while at the same time applying the required force needed to attain stated political objectives? The phrase 'Force-Casualty Aversion' (FCA) is what is used to describe this operational puzzle.

Furthermore, the political environment of the 21st century presents a security dilemma which seeks to avert huge turnout of casualties while employing preponderant force in order to achieve the required political objective. Emerging non-lethal weapon technologies hold the ace in confronting this strategic and operational dilemma. Non-lethal weapons represent a shift from the increasingly lethal evolution of military arms.⁴¹ Support for non-lethal weapons is largely reserved for operations-other-

³⁹ Michael Elliot, 'Afghanistan: A New Kind of Warfare', *Time Magazine*, October 22, 2001.

⁴⁰ Herfried Munkler, 'The Wars of the 21st Century', *International Review of the Red Cross*, Vol. 85, No. 849, 2003, p. 10.

⁴¹ Joseph Siniscalchi, 'Non-Lethal Technologies: Implications for Military Strategy', Occasional Paper No. 3, Centre for Strategy and Technology, Air War College, March 1998, p.1.

than-war, where limiting casualties has a direct military utility.⁴² This is so since sensitivity to military losses plays a key role in limiting a state's freedom to deploy armed forces in military missions. Increased casualties as seen in the U.S. war against Afghanistan (2001) and Iraq (2003) has been connected with public disapproval for the use of force or the inclination towards war. As such, the rhetoric of avoiding casualties is employed in support of non-lethal weapons.⁴³ Studies have shown that soldiers' death affect both individual and aggregate levels of support for a war,⁴⁴ presidential approval rates,⁴⁵ public perception of a war's progress and likelihood of success⁴⁶ and the tenure of elected leaders.⁴⁷ Willingness to tolerate the human cost of war is conditional on an individual's perception of the importance of issues at stake,⁴⁸ the

⁴² Jürgen Altmann and Judith Reppy, 'Non-Lethal Weapons: Democratic Necessity or Business as Usual?' in Mathew Evangelista, Herald Müller and Niklas Schöring (eds.), *Democracy and Security: Preferences, Norms and Policy-Making*, Oxon: Routledge Publishers, 2008, p. 47.

⁴³ G. T. Allison and P. X. Kelly, *Nonlethal Weapons and Capabilities: Report of an Independent Task Force*, New York: Council on Foreign Relations, 2004.

⁴⁴ See the following: W. A Boettcher and M. D. Cobb, 'Echoes in Vietnam? Casualty Framing and Perceptions of Success and Failure in Iraq', *Journal of Conflict Resolution*, Vol. 50, No. 6, 2006, pp. 831-854. R. C. Eichenberg, 'Victory has Many Friends: US Public Opinion and the Use of Military Force, 1981-2005', *International Security*, Vol. 30, No. 1, 2005, pp. 140-177. Scott S. Gartner and G. M. Segura, 'Race, Opinion and Casualties in the Vietnam War', *The Journal of Politics*, Vol. 62, No. 1, 2000, pp.115-146. S. S Gartner and G. M. Segura 'War, Casualties and Public Opinion', *Journal of Conflict Resolution*, Vol. 42, No. 3, 1998, pp. 278-300. L. Klarevas, 'The Polls-Trends: The United States Peace Operations in Somalia', *Public Opinion Quarterly*, Vol. 64, Winter, 2001, pp. 523-540. E. V Larson and B. Savych, *American Support for U.S. Military Operations from Mogadishu to Baghdad*, Santa Monica: RAND Corporation, 2005. E. V. Larson, *Casualties and Consensus: The Historical Role of Casualties in Domestic Support for U.S. Military Operations*, Santa Monica, CA: Rand Corporation, 1996. J. E. Mueller, *War, Presidents and Public Opinion*, New York: John Wiley and Sons, 1973.

⁴⁵ See the following: R. C. Eichenberg, R. J. Stoll, and M. Lebo 'War President: The Approval Ratings of George W. Bush', *Journal of Conflict Resolution*, Vol. 50, No. 6, 2006, pp. 783-808. P. D. Feaver, and C. Gelpi, *Choosing your Battles: American Civil-Military Relations and the Use of Force*, Princeton: Princeton University Press, 2004. C. Gelpi, P. D. Feaver, and J. Reifler 'Success Matters: Casualty Sensitivity and the War in Iraq', *International Security*, Vol. 30, No. 3, 2005/06, pp. 7-46.

⁴⁶ See W. A Boettcher and M. D. Cobb 'Echoes in Vietnam?...', pp. 831-854. See also E. Voeten and P. R. Brewer, 'Public Opinion, The War in Iraq, and Presidential Accountability', *Journal of Conflict Resolution*, Vol. 50, No. 6, 2006, pp. 809-830.

⁴⁷ See B. Bueno de Mesquita, A. Smith, R. Siverson, and J. Morrow, *The Logic of Political Survival*, Cambridge, MA: MIT Press, 2003. See also Scott S. Gartner and Gary. M. Segura 'Race, Casualties, and Public Opinion in Vietnam War', *Journal of Politics*, Vol. 62, No. 1, February 2000, pp. 115-146.

⁴⁸ E. V Larson and B. Savych, *American Support for U.S. Military Operations from Mogadishu to Baghdad*, Santa Monica: RAND Corporation, 2005.

likelihood of success,⁴⁹ elite consensus,⁵⁰ uncertainty about future casualty patterns⁵¹ or contextual information like the number of enemy casualties.⁵²

On the contrary, some scholars have argued that casualties have most often led to pressure for escalation of the war effort to victory, rather than demands for withdrawal.⁵³ This is informed by the understanding that intangible effects of withdrawing from a war effort include anticipated damage to the state's reputation and influence and the psychological pain of failing to redeem the country's human and material investments in a war effort by attaining the benefits of victory.⁵⁴ After sinking blood and treasure into the war effort, the public may fear that terminating a war short of victory will affect the state's reputation for strength or resolve and reduce the country's influence.⁵⁵ Thus, there could be public aversion to seeing a country lose a military contest it initiated where core values and irreducible minimums (like territorial integrity and sovereignty) are at stake. In such cases, they tend to be more 'defeat-phobic' than 'casualty-phobic'. Moreover, citizens may view and measure the cost of military engagement in military and civilian casualties as well as investments that can

⁴⁹ Christopher Gelpi, Peter Feaver, and Jason Reifler, 'Success Matters: Casualty Sensitivity and the War in Iraq', *International Security*, Vol. 30, No. 1, 2005/6, pp. 7-46.

⁵⁰ Eric V. Larson, *Casualties and Consensus: The Historical Role of Casualties in Domestic Support for U.S. Military Operations*, Santa Monica, CA: RAND, 1996.

⁵¹ Scott S. Gartner, 'Secondary Casualty Information: Casualty Uncertainty, Female Casualties, and Wartime Support', *Conflict Management and Peace Science*, Vol. 25, No. 2, 2008, pp. 98-111.

⁵² W. A. Boettcher and M. D. Cobb 'Echoes in Vietnam? Casualty Framing and Perceptions of Success and Failure in Iraq', *Journal of Conflict Resolution*, Vol. 50, No.6, 2006, pp. 831-854.

⁵³ Steven Kull and I. M. Destler, *Misreading the Public: The Myth of a New Isolationism*, Washington, DC: Brookings Institution Press, 1999. See also B. C. Schwarz, *Casualties, Public Opinion and U.S. Military Intervention: Implications for U.S. Regional Deterrence Strategies*, Santa Monica, CA: Rand Corporation, 1994.

⁵⁴ Patricia L. Sullivan 'Sustaining the Fight: A Cross-Sectional Time-Series Analysis of Public Support for Ongoing Military Interventions', *Conflict Management and Peace Science*, Vol. 25, No. 2, 2008, p. 116.

⁵⁵ See the following: Alexandra Guisinger and Alastair Smith, 'Honest Threats: The Interaction of Reputation and Political Institutions in International Crises', *Journal of Conflict Resolution*, Vol. 46, No. 2, pp. 175-200. Fred C. Iklé, *Every War Must End*, New York: Columbia University Press, 1991. Thomas C. Schelling, *Arms and Influence*, New Haven: Yale University Press, 1996. Patricia Sullivan and Scott Gartner, 'Disaggregating Peace: Domestic Politics and Dispute Outcomes', *International Interactions*, Vol. 32, No. 2, pp. 1-25. Jeffrey W. Taliaferro, *Balancing Risks: Great Power Intervention in the Periphery*, Ithaca, N.Y.: Cornell University Press, 2004. Shiping Tang, 'Reputation, Cult of Reputation, and International Conflict', *Security Studies*, Vol. 14, No. 1, pp. 34-62.

only be redeemed if the state prevails.⁵⁶ According to this perspective, only victory can justify the sacrifices that have been made and the marginal cost of persevering can seem bearable relative to the losses that have already been incurred.⁵⁷ Thus as commitment increases due to the pursuit or defence of core values (which are irreducible), cost soars, and the desire to redeem those sunk with a favourable victory outcome increases.

Feaver and Gelpi⁵⁸ conclude that casualty tolerance is positively correlated with an individual's subjective belief in the importance of a particular military mission and confidence that the military effort will be successful. As Louis Kriesberg summarizes,

Having sunk resources into a fight, sinking more and more resources seems justified in order to attain the goal of the struggle and to justify what has already been expended in money, honour, or blood. This ever-increasing commitment and allocation of resources may go much beyond the original value of the goal, but the combatants are trapped into continuing and even escalating the struggle.⁵⁹

However, there is a tendency for public willingness to sustain military operations to decline as the actual and anticipated cost of the engagement increase. In all, it can be argued that public wartime support regarding the use of military means to achieve the end of policy tends to rise with the anticipation of a quick military victory, but start falling after the military engagement is stretched to a 'yield point' where human suffering can no longer be condoned due to a thinned out wartime economy. This is usually expressed and realised in countries or nations with democratic credentials.

War results in death and loses and the death of a soldier in war is mostly seen as an act of patriotism, heroism, valour, sacrifice and responsibility. However, the same

⁵⁶ See the following: Zeev Maoz, *Paradoxes of War: On the Art of National Self-Entrapment*, Boston: Unwin Hyman, 1990. Kenneth E. Boulding, 'Pathologies of Defense', *Journal of Peace Research*, Vol. 21, No. 2, pp. 101-108. Allan Teger, *Too Much Invested to Quit*, New York: Pergamon Press, 1980.

⁵⁷ See the following: Louis Kriesberg, *Constructive Conflicts: From Escalation to Resolution*, Lanham, MD: Rowman and Littlefield, 2003. Joel Brockner and Jeffrey Rubin, *Entrapment in Escalating Conflicts: A Social Psychological Analysis*, New York: Springer-Verlag. Christopher R. Mitchell, *The Structure of International Conflict*, London: Macmillan, 1981.

⁵⁸ Peter D. Feaver and Christopher Gelpi, *Choosing Your Battles: American Civil-Military Relations and the Use of Force*, Princeton: Princeton University Press, 2004.

⁵⁹ Kriesberg, p. 161.

does not serve a good explanation for civilian death in war. The effect of war is felt in the loss of family members, friends, and fellow citizens. As the dynamics of war differ, the patterns of human costs also vary between conflicts. Casualties represent the primary information individuals use to evaluate war, assess past costs, estimate future cost, and formulate their positions.⁶⁰ Casualties in war does not only refer to those killed in action (KIA), wounded in action (WIA), missing in action (MIA), and prisoners of war (POW), but also those displaced in action (DIA), raped in action (RIA), and maimed in action (MIA).

Since wartime deaths represent the most visible cost of a nation's involvement in war, political accountability for casualties affects states' willingness to get engaged in wars.⁶¹ As such, casualties do not only inform people about the cost of a conflict, but also act as gatekeepers shaping wartime opinion formation process.⁶² Given this reality, there is a tendency for public pressure for war termination to build as casualties mount. Essentially, casualty sensitivity has been argued to rest on wide-ranging political variables such as:

1. cost-benefit calculations⁶³ which is predicated upon the extent to which the war is portrayed as successfully attaining its original goals⁶⁴;
2. the definition of the war's goals in relation to the level of perceived threat. In this case, the greater the perceived threat and the role of war in eliminating it, the greater the legitimacy of sacrificing human life⁶⁵;
3. the public's view regarding the 'rightness' of war⁶⁶;

⁶⁰ Gartner, p. 99.

⁶¹ M. Koch and S. S. Gartner 'Casualties and Constituencies: Democratic Accountability, Electoral Institutions and Costly Conflicts', *The Journal of Conflict Resolution*, Vol. 49, No. 6, 2005, pp. 874-894.

⁶² Gartner, p. 109.

⁶³ Eric V. Larson, *Casualties and Consensus: The Historical Role of Casualties in Domestic Support for U.S Military Operations*, Santa Monica, CA: RAND, 1996, pp. 10-12.

⁶⁴ D. Peter Feaver, and Christopher Gelpi, *Choosing Your Battles*, Princeton, NJ: Princeton University Press, 2003.

⁶⁵ Bruce W Jentleson, 'The Pretty Prudent Public: Post Post-Vietnam American Opinion on the Use of Military Force', *International Studies Quarterly*, Vol. 36, No. 1, 1992, pp. 49-74.

⁶⁶ Christopher Gelpi, Peter Feaver, and Jason Reifler, 'Success Matters: Casualty Sensitivity and the War in Iraq', *International Security*, Vol. 30, No. 1, 2005/6, pp. 7-46.

4. the decline of public support as the number of casualties increases⁶⁷;
5. the level of consensus among the elite shapes the public response to casualties⁶⁸;
6. the social profile of the military⁶⁹; and
7. its reflection in the attitude to death.⁷⁰

To balance the propensity to use military force to protect what is deemed the national interest, with the domestic limitations imposed by increased casualties, there is need to reduce the level of casualties. The need to attain casualty aversion has given rise to military doctrines that strive to limit the risk of military and civilian fatalities. To the attainment of this purpose the current RMA, which seeks ways of waging swift campaigns with minimal combat casualties, plays a vital role. The development of non-lethal weapons marks one of the significant breakthroughs of 21st century RMA.

In J. B. Alexander's view, non-lethal weapons have been driven by geopolitical realities, technological advancement, and military commanders demanding alternatives to lethal force.⁷¹ The introduction of non-lethal weapons, it should be noted, is not simply the development and deployment of new weapons, instead it is the introduction of dramatically different perspective on the use of force.⁷² It represents the compelling need to use force rationally with minimal casualties. In both asymmetric and conventional environments, avoiding non-combatant casualties has become increasingly important to the success of military operations.⁷³ Non-lethal weapons hold the ace in accomplishing this significant and strategic necessity. Given the strategic

⁶⁷ John Mueller, 'Force, Legitimacy, Success, and Iraq', *Review of International Studies*, Vol. 31, No. 2, pp. 109-125.

⁶⁸ Mandel Roberts, *Security, Strategy and the Quest for Bloodless War*, Boulder, CO: Lynne Rienner, 2004, p. 26.

⁶⁹ Joseph Paul Vasquez, 'Shouldering the Soldiering: Democracy, Conscription, and Military Casualties', *Journal of Conflict Resolution*, Vol. 49, No. 6, pp.849-873.

⁷⁰ Yagil Levy, 'An Unbearable Price: War Casualties and Warring Democracies', *International Journal of Politics, Culture, and Society*, Vol. 22, No. 1, 2009, pp. 69-82.

⁷¹ J. B. Alexander, 'Non-Lethal Weapons: The General After Next', 1st European Symposium on Non-Lethal Weapons, Sept. 25-26, 2001, Fraunhofer ICT, Pfinztal Germany.

⁷² D. A. Lund, 'Non-Lethal Weapons: The Training Paradox', 1st European Symposium on Non-Lethal Weapons, Sept. 25-26, 2001, Fraunhofer ICT, Pfinztal Germany.

⁷³ Tracy J. Tafolla, David J. Trachtenberg and John A. Aho, 'From Niche to Necessity: Integrating Nonlethal Weapons into Essential Enabling Capabilities', *JFQ*, Issue 66, 3rd Quarter 2012, p. 72.

consequences of civilian casualties in warfare, non-lethal weapons can help manage such vulnerabilities. Attention should be brought to the reality that negative consequences of civilian casualties are magnified by the instantaneous transmission of information, enabled by technology and driven by the demands of an instant news cycle.⁷⁴ This goes a long way to exacerbate negative perceptions of a nation's military might thereby reducing support for continuous fighting. The use of non-lethal weapons can have a strategic 'multiplier effect' by avoiding collateral damage to property and infrastructure, minimising unintended civilian casualties, overcoming negative perceptions of a state's military, denying opportunities for enemy propaganda victories, and minimising long-term reconstruction cost.

In essence, the revolutionary impact that non-lethal weapon has on warfare lies in minimised casualties and collateral damages as well as reversibility of damage and the overall civilisation of warfare. The historical nexus between casualties and lethality is what non-lethal weapons seek to disrupt. However, Joseph Siniscalchi⁷⁵ argues that while the employment of non-lethal technologies is maturing for tactical application; the evolution of non-lethal technologies for the more general war-fighting applications is still being conceptualised. Be that as it may, the increasing development and deployment of non-lethal weapons in the 21st century seems to gain favour with international humanitarian law with its general rules that the sole purpose of combat is to render the opponent incapable of combat and that superfluous injury and unnecessary suffering is to be avoided.

Conclusion

The paper examines non-lethal weapons as a strategy for achieving a zero probability of producing fatalities and casualties in warfare. Non-lethal weapons seek to minimise rather than maximise lethality. Ostensibly, the main impulse for the development and deployment of non-lethal weapons has been to apply force without causing permanent injury or death, given the background of public aversion to

⁷⁴ Ibid., p. 74.

⁷⁵ Siniscalchi, p. 1.

excessive casualties. Non-lethal weapons seem to represent the end-point in the evolution of weapon technologies by man. It defines a period in the history of warfare where garments will no longer be rolled in blood. It captures the idea that war could be waged without killing combatants and civilians alike. Apart from playing a significant role in Force-Casualty Aversion, non-lethal weapons allow for a broad range of employment options across a wider spectrum of contingencies with the capacity to affect outcomes from the tactical ('boot lace') level to the strategic. However, despite their relevance to today's contingency operations, non-lethal weapons remain an underutilised asset. The rate at which the defence forces of states embrace and invest in non-lethal weapons is still very slow. However, a significant number of observers still consider it utopia. Their existence does not create an obligation to use them. Accepting non-lethal weapons as an integral element of the soldier's toolkit requires a cultural shift that seems to be counterintuitive to the military. However, if militarism and bellicosity should be buried beneath the avalanche of casualty shyness, then non-lethal weapons would hold a significant place in ensuring such operational reality.